

**Interim Clean Energy and Climate Plan for 2030 Public Comment--Letters Submitted by 3/22/2021**

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Via Electronic Email and [Online Portal](#)

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
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Boston, MA 02114  
[gwsa@mass.gov](mailto:gwsa@mass.gov)

**Subject: Health Care Without Harm Comments on the Interim Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

Thank you for the tremendous amount of work that has gone into developing the 2050 Roadmap Report and the Draft Interim CECP for 2030. These documents and the related technical reports are and will continue to be important resources that inform state policy and a comprehensive clean energy and climate strategy for the next several years.

Health Care Without Harm is committed to transforming health care so that it reduces its environmental footprint, becomes a community anchor for sustainability and resilience, and a leader in the global movement for environmental health and justice. We work with over 1,200 hospitals in the US, including many systems in Massachusetts that are pursuing decarbonization strategies and climate commitments in their own facilities.

Our organization has joined others in supporting comprehensive comments regarding each sector discussed in the plan. Our organization has also helped to coordinate comments from the Climate Justice Working Group (CECP), but we also wish to offer comments that reflect the challenges to decarbonization that are specific to health systems.

**Health Care Without Harm strongly urges EEA and the Baker administration to include health care sector expertise on the Clean Heat Task Force & Clean Heat Commission.**

Massachusetts' ability to account for challenges to thermal decarbonization in health care will be best addressed through sector engagement. Health care has unique energy needs and requirements, with hospitals operating 24 x 7 to provide essential services and care to patients and communities. Hospitals use a large amount of thermal energy for space heating and reheat needs, as well as steam heat for sterilization and humidification requirements. Hospitals are also required, under federal regulations, to store fuel on-site to sustain operations for at least 96 hour loss of utility supply. The most common fuel source for these back-up power and heating requirements is fossil fuels, with diesel generators the required standard of care, which currently work with natural gas to supply a redundant heating source. It is

therefore imperative that the health care sector is represented on the Governor-appointed Clean Heat Commission and that sector expertise is reflected in the interagency task force.

**Health Care Without Harm encourages EEA and the Baker administration to fully explore and integrate into state policy and planning near term and long term health benefits associated with renewable energy purchases and the phase out of fossil fuels, including health care costs contained, reduced illness, and premature deaths avoided.**

There are quantifiable benefits associated with energy efficiency and renewable energy, especially in the wake of COVID-19, that are not fully reflected in the policy recommendations included in the CECP for 2030. While we appreciate the initial exploration of the health benefits of decarbonization included in the 2050 Roadmap Report, and we recognized that this informed development of the 2030 CECP, the analysis was limited and does not truly reflect the full breadth of health impacts associated with energy and transportation emission reductions, both of which lead to avoided health and societal costs. The health benefits referenced at the end of the Economic and Health Impacts Report includes a range from \$2 billion to \$4.5 billion relative to today, providing a small glimpse into potential cost savings and health impacts associated with the *All Options* pathway to 2050. Health Care Without Harm strongly encourages deeper exploration of the health impacts associated with greenhouse gas (GHG) emission reduction strategies employed in the near term and needed to achieve net zero in the long term.

We look forward to working with the administration to complete the CECP and transition to implementation.

Thank you for your time and consideration.

Sincerely,

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March 22, 2021

Submitted electronically via: [gwsa@mass.gov](mailto:gwsa@mass.gov)

Kathleen Theorharides  
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Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

## **Re: Interim Clean Energy and Climate Plan for 2030 – Buildings Sector**

Dear Secretary Theorharides,

On behalf of Northeast Energy Efficiency Partnerships (NEEP)<sup>1</sup>, we are pleased to submit comments on the Interim Clean Energy and Climate Plan for 2030. NEEP is a non-profit whose mission is to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

We thank the Office of Energy and Environmental Affairs (EEA) for the opportunity to provide input on the Interim Clean Energy and Climate Plan for 2030 (CECP). We commend Massachusetts for taking a momentous step in the transition to decarbonization with the publishing of the 2050 Decarbonization Roadmap Study and the Interim Clean Energy and Climate Plan for 2030. NEEP hopes these comments will help to design and implement a decarbonization policy that is both equitable and cost-effective for the Commonwealth.

The following comments are intended to provide technical assistance and resources relating to the decarbonization of the building sector. In addition to these recommendations, NEEP has tools and resources available and can offer direct technical assistance.

## **Introduction**

In 2008, Massachusetts passed the Global Warming Solutions Act (GWSA), becoming one of the first states in the nation to adopt ambitious Greenhouse Gas (GHG) reduction limits consistent with the goals established by the Intergovernmental Panel on Climate Change (IPCC). The GWSA requires that the Secretary of the Executive Office of Energy and Environmental Affairs (EEA) to set interim emissions limits for 2020, 2030, 2040, as well as a final limit for 2050, considering feasibility and cost-effectiveness.

In January 2021, Governor Charles Baker committed Massachusetts to achieving net-zero emissions by 2050. To achieve this goal, Massachusetts engaged in a [2050 Decarbonization Roadmap](#) planning process, which considered multiple technical and policy pathways by which the Commonwealth could equitably and effectively achieve net-zero in 2050. The final report identifies four core components that are critical for all eight of the analyzed pathways: a balanced clean energy portfolio anchored by significant offshore wind resources, more

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<sup>1</sup> These comments are offered by NEEP staff and do not necessarily represent the view of the NEEP Board of Directors, sponsors or partners. NEEP is a 501 (c)(3) non-profit organization that does not lobby or litigate.



interstate transmission, widespread electrification of transportation and building heat, and reducing costs by taking action at the point of replacement for equipment, infrastructure, and systems that use fossil fuels.

The Interim Clean Energy Climate Plan 2030 builds on the 2050 Decarbonization roadmap to create an ambitious but workable strategy to achieve 2030 statewide emissions that are 45% below 1990 levels while maximizing Massachusetts' ability to achieve net-zero emissions in 2050. NEEP has focused its comments on the three strategies identified in the buildings sector section:

- B1: Avoid Lock-In of Building Systems that are not 2050-Compliant
- B2: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems
- B3: Convene the Commission and Task Force on Clean Heat and Cap Heating Fuel Emissions.

We have provided comments on strategies B1 and B2 as well as additional information on technical resources available for policies discussed under B3. While the Task Force has not yet been identified, NEEP would like to offer its technical expertise as the Task Force is formed.

## **Strategy B1: Steps to Avoid Lock-In of Building Systems That Are Not 2050- Compliant**

NEEP applauds Massachusetts for highlighting the need to avoid the lock-in of building systems that are not 2050 compliant. This will limit the need to retrofit buildings down the road, avoiding unnecessary costs. Two important parts of this strategy are high-performance stretch energy codes and appliance standards to accelerate market transformation.

### ***High Performance Stretch Energy Code***

Building energy codes dictate the minimum energy efficiency for new building construction and existing building alteration. In this way, energy codes represent the “floor”—the least efficient buildings that can be built by law. NEEP has extensive experience and knowledge on the proactive use of energy codes for decarbonization. Stretch codes, zero-energy codes, and building performance standards are examples of this. High efficiency state energy codes do not happen overnight and will likely need coordination among different government and private sector stakeholders.

NEEP encourages Massachusetts to consider enacting a voluntary zero energy stretch code for residential and commercial homes and buildings. It is critical that as part of this effort, municipalities have the option to opt in to a zero energy stretch code. NEEP also recommends that the state update the energy stretch code statewide along with energy base code updates to ensure a consistent above-code option until it becomes a mandatory statewide zero energy code no later than January 1, 2028.

In creating the energy stretch code, the EEA could also consider:

- Envelop provisions standards, such as PassiveHouse, to lower heating and cooling load demands and improve home and building resilience.



- Requiring the installation of electric vehicle infrastructure at time of construction for residential and commercial homes and buildings.
- Requiring electric ready infrastructure for electric appliance alternatives to oil and gas options, including energy storage, solar-ready infrastructure on rooftops.

Finally, NEEP recommends, as part of this effort, conducting a comprehensive statewide home and building retrofit study to determine needs in existing building stock, achievable retrofit packages for residential and commercial homes and buildings, and priority communities that face the greatest energy burdens, air pollution levels, and income restraints.

### ***Energy Codes Inspection and Market Transformation***

A critical component of enforcing high performance stretch energy codes will be compliance. In addition to the regulation of codes, NEEP recommends that the state consider strategies to increase enforcement and inspection capabilities as well as engage stakeholders from the building design and construction industry to identify pathways for the transition of the industry. The fact is, the creation of a code can only go as far as the workforce's ability to implement the equipment and the state's ability to enforce and track compliance. Properly trained inspectors and local enforcement are necessary for widespread adoption to achieve carbon targets. To increase code enforcement and compliance capacity NEEP recommends the Commonwealth consider:

1. Utilizing third-party energy specialists;
2. Establishing an energy code compliance collaborative;
3. Developing robust training and certification requirements for code-inspectors, plan reviewers, and building industry professionals and;
4. Implement statewide electronic permit processing, plan review, inspection, and fee collection systems.
5. Regularly (ahead of new base energy code adoptions) measure compliance with the current energy code to inform training that target identified areas of non-compliance.
6. Including an energy code savings attribution program that allows utilities to claim savings from increased code compliance based on activities and support they offer, such as training on energy code provisions or implementing an energy code circuit rider. Massachusetts has led the way in this process with the [Energy Code Technical Support Initiative](#); as the state enacts stricter codes it will be important to continue to update the programs offered.

It is important to also consider the transition of the building design and construction industry. NEEP recommends the state provide support for training and accreditations by establishing quarterly up-to-date, free-of-charge CEU credit-accruing workshops and classes to architects, contractors, manufacturers, code officials, inspectors, builders and related design and construction professionals that focus specifically on base and stretch energy code provisions. Creating state supported programs will ensure a properly trained workforce. While, providing classes on a regular bases and without charge will promote a diverse and inclusive workforce, ensuring that costs do not prevent access to careers for workers across the state.





An alternative or additional strategy to workforce training, is a policy that supports prefabricated off-site (factory built) construction methods by providing private developers and contractors incentives to transition from on- to off-site construction methods so that 50% of all new state construction is constructed off-site by 2035.

### ***Appliance Standards***

NEEP applauds the EEA for recognizing the need to enact stricter appliance standards as part of this strategy; making appliance standards a priority will increase energy efficiency and save consumers and businesses money. Several states in the region have made enacting and promulgating new state-level appliance standards an energy policy priority. For example, Vermont has passed two appliance standards bills, H410 and H411, and DC passed bill B23-0204, which sets energy and water efficiency standards for at least 19 products not covered by federal standards. Research suggests, by 2025, consumers and businesses in DC will save a total of \$54 million annually due to these new standards. In addition, Rhode Island, Connecticut, Pennsylvania, Maryland, and New Jersey are also considering standards.

Massachusetts has an appliance law in the legislature, Senate Bill S30, An Act Creating a Next Generation Climate Roadmap. This bill would be a huge step forward in advancing appliance standards in the state. In addition to this effort, Massachusetts can look to the federal level for key product categories to consider in the coming years by monitoring and actively engaging in DOE federal rulings for product categories such as water heaters, central AC/heat pumps etc.

### ***Utility Business Model Modifications to Accelerate Building Codes and Appliance Standards***

NEEP recommends Massachusetts consider modifications to the utility business model to encourage the use and purchase of efficient equipment by placing incentives and rebates throughout the supply chain.

For building codes, an efficient transformation to high performance buildings should both set the standards at the top and identify pathways from the bottom up. Mass Save has been a nation leading energy efficiency program and should continue to support all parts of Massachusetts' efforts to decarbonize. Therefore, NEEP encourages the EEA to also consider what incentives are and could be available to encourage this transformation. It is important that these considerations also look at moderate- and low- income barriers to these programs such as how to make these programs financially viable and accessible to multi-family projects and single homes in a way where all can participate and have access to the benefits.

For appliances, Mass Save currently covers rebates for various ENERGY STAR appliances, including rebates for early replacement of refrigerators and clothes washers. Updating appliance standards will change the market landscape for these products, but utility programs and incentives will get the appliances into the homes of consumers. Mass Save can ensure appliance uptake by broadening the coverage for incentives or early replacement categories. Early replacement recommendations are especially important as this seeks to inform



the customer of the energy efficiency option before the item breaks and needs to be replaced immediately. Additionally, properly trained contractors will make energy efficient appliances their first choice.

Finally, there is the consideration of attribution. Building codes and appliance standards will lower the energy usage in a utilities territory, which can create tension between the policy goals of the state and the financial constraints for utilities. By creating programs where the utilities receive attribution for participation or programs that are a part of their energy efficiency portfolio, the state can ensure utilities help to achieve decarbonization policy goals and remove any disincentive to work together. Massachusetts has led the way in this process with the [Energy Code Technical Support Initiative](#); as the state enacts stricter codes and standards it will be important to continue to update the programs offered.

## **Strategy B2: Pivot the market for building envelope retrofits and clean heating systems**

Massachusetts is correct in identifying the need to pivot the market as part of the effort to ensure the majority of the commonwealth has affordable access to deep energy efficiency retrofits, weatherization, and clean heating systems.

NEEP recommends that the state consider standardizing the definition of a deep energy efficiency retrofit so that it amounts to a level of savings achieved in the home or results in a minimum efficiency standard, such as a Passive House. Deep energy efficiency retrofits can include: improving home and building weatherization, air sealing that reduces thermal losses during extreme temperatures, or whole-home retrofit transition plans for owners of existing buildings and whole-home energy assessments free of charge (Retrofit transition plans can be over varying durations of time depending on the characteristics of the home). Massachusetts could initially target buildings with oil, propane, or electric resistance as their primary fuel type as early adopters of deep energy retrofits. These retrofits are the most cost effective and can lead to the greatest energy savings and health benefits from replacing the use of these fuels on property. In addition, the state can consider holistic programs such as the Vermont model of Zero Energy Now, which combines energy efficiency, electrification, and renewables in a bundled approach to reduce confusion and expedite the decarbonization retrofit process for homeowners while maximizing savings. Finally, as part of this initiative, NEEP recommends the state look to streamline incentive program structures with minimal burden on the homeowner. Contractors should be supported and heavily involved in the incentive granting process.

Below, NEEP has identified additional recommendations to help implement this strategy including workforce and market transformation, ensuring equitable access, and modifications to the utility business model.

### ***Scaling Up the Clean Heat Workforce***

While the state has ambitious goals for heat pump adoption, it needs to ensure that in the implementation of them high quality systems are being installed well. To do so, NEEP recommends that Massachusetts “hurry up, slowly” in growing the market and training the workforce. High consumer satisfaction at this stage of market adoption will breed sustained growth. To achieve this, there should be a focus on installer training around



design, installation, and commissioning; as well as ongoing support for installers and inspectors to verify high-quality installations and performance. This will ensure that successful adoption of clean heat technologies and enable the state to implement policies that can grow and diversify the workforce.

To develop the clean energy market there will be a growing demand for all kinds of new workers including renewable thermal HVAC installers, home auditors, building operators, code officials, and design professionals. The state can leverage existing resources such as local vocational and technical high schools and community colleges to get students engaged in energy efficiency related workforce tracks. Workforce development can also have beneficial impacts on underserved communities by providing desirable skills and well-paying jobs. A great example is the California Community College's Advanced Transportation and Logistics Sector program; a partnership between the California Community Colleges and the California Energy Commission (CEC). The CEC provides funding to update facilities and curriculums primarily in underserved communities.

NEEP has developed resources that may help in building the capacity of the workforce as it pertains to upgrading building envelopes and installing high efficiency equipment. This includes a guide for installers on [sizing and selecting ASHP's for cold climates](#), and a [buying guide for consumers](#) to provide them with a background of knowledge on the technology, what to look for and the best questions to ask their installer for a high quality installation. More resources for both Installers and consumers can be found on NEEP's [Installer and Consumer Resources](#) webpage. Further, NEEP's regional Air-Source Heat Pump product list can be leveraged to ensure that the systems being installed are energy efficient and capable of handling New England winters. 20 programs across the region and Canada utilize NEEP's cold climate Air-Source Heat Pump specification to validate equipment eligible for incentives.

### ***Equitable Access to Deep Energy Efficiency Retrofits and Clean Heating Systems***

The CECP recognizes that deep building envelope efficiency retrofits with heat pumps will be the least-cost decarbonization pathway for at least 60%, and potentially more than 95%, of households.<sup>2</sup> In addition to costs, depending on the building stock in Massachusetts, deep building envelope efficiency retrofits will likely need to incorporate home repairs or risk leaving a portion of residents without access to these programs. Physical barriers such as mold, asbestos, and lead are serious issues because they restrict building owners from making energy efficiency improvements, and disproportionately impact low income communities. Structurally deficient homes are at a disadvantage because not only are they prevented from participating in current program offerings but also use disproportionately more energy and have no way to improve. NEEP recommends the state recognize that additional funding will need to be identified to deliver structural repairs and ensure equitable access to deep energy retrofits and clean heating systems throughout the Commonwealth.

Coordination of various funding for multi-family projects occurs through the Massachusetts Low-Income Energy Affordability Network (LEAN), NEEP suggests considering applying a similar approach to single family residential programs as well. Outside of Massachusetts, states and cities have started to design and implement programs

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<sup>2</sup> Massachusetts Executive Office of Energy and Environmental Affairs, [Interim Clean Energy and Climate Plan for 2030](#), December 30 2020, page 13.



that both identify funding for these repairs and reduce administrative burdens for participants. In Philadelphia, the Built to Last Platform allows the Philadelphia Energy Authority to act “as an administrative backbone to allow housing programs to layer and streamline their services.” Built to Last identifies funding sources to pay for structural repairs and coordinates benefits screening, property audits, and the construction process for participants. In Delaware, the Energize Delaware Pre-Weatherization Program uses Regional Greenhouse Gas Initiative funds to directly repair homes that have been deferred under the state's Weatherization Assistance Program (WAP). For the program, participants can receive \$3,000 to \$4,000 per home for repair, with an upper limit of \$7,500 if needed. In addition to providing funding, the program inspects homes, hires contractors, schedules repair work, and performs a quality assurance post-inspection.

Currently, for low and moderate income customers, Mass Save offers the enhanced residential program and the income eligible program; both programs offer no cost insulation upgrades, with income eligible offering no-cost air-sealing upgrades and new home appliances as well. NEEP applauds Massachusetts for creating and implementing these initiatives, and recommends that Massachusetts consider adding additional program enhancements to increase deep energy efficiency retrofits across the state. For example, in 2019, Bay State Gas Company d/b/a Columbia Gas of Massachusetts (“CMA”) provided an enhanced weatherization offering to support the homes and businesses impacted by the September 2018 natural gas explosion incidents in the Greater Lawrence portion of its service territory.<sup>3</sup> This plan waived the co-payment and provided no cost weatherization for customers; increased CMA’s workforce in the area to reduce wait times; reduced the rebate times for customers from 4 - 8 weeks to 5-7 business days; assigned project managers to small business customers to help guide them through the weatherization and retrofit process; offered higher rebates and incentives to all participants; offered enhanced incentives to mitigate barriers (e.g. knob and tube wiring, asbestos removal); gave free weatherization to small business, non-profit, and faith organizations; utilized geo-targeting to identify customers; and expanded customer education and marketing efforts to increase enrollment.

Finally, NEEP recommends that Massachusetts also consider ways to partner with low- and moderate- income communities and center these programs on the needs of these communities through taking steps such as:

- Creating programs that are community based or partnered with community organizations.
- Reducing documentation required for participation. For example, the state could remove income qualifiers and replace them with zip codes or census tracts.
- Streamlining and /or packaging services offered so that the individual does not have to contact individual contractors or coordinate additional resources to participate.

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<sup>3</sup>Massachusetts Office of Energy and Environmental Affairs, Docket No: D.P.U. 18-110, Information Request, DPU-CMA- 1-1, November 19, 2018, available at <https://www.google.com/url?q=https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/10054081&sa=D&source=editors&ust=1616102393451000&usg=AOvVaw1yKeAIYQHhdFRrjJTN7Lmj>.



- Incorporating and leveraging all available funds for households and businesses to ensure cost effective, holistic weatherization and electrification.
- Formulating programs alongside communities that are meant to benefit from them to ensure it is designed to accommodate their needs as this it will not be a one size fits all approach.
- Utilizing a community based workforce training program to ensure equal access and opportunity to jobs and careers as the workforce to deliver these retrofits is identified.
- Recognizing the existing disproportionate energy burden and offering ways to keep electricity rates low and manageable for low- and moderate- income communities such as increasing access to community solar.

### ***Utility business models to affordably deploy clean heating systems and deep energy retrofits;***

NEEP applauds the EEA for identifying using utilities programs to affordably deploy clean heating systems and deep energy retrofits. These programs have a preexisting network of contractors and are renowned for their success. With proper guidance and oversight, expanding on these pre-existing programs could be advantageous because utilities have the ability to scale and deploy new programs and a trained a workforce across the state.

For example, Mass Save's [Home Energy Assessment](#) provides an in-home energy audit that looks at insulation of the home, equipment rebates that could save costs, and appliances (smart plug strip and LED light bulbs) that can be installed easily by the owner. NEEP recommends that the state consider modifying this program to include deep energy retrofits by adding elements such as weatherization and structural repair to the process and incorporating clean heating systems and other efficiency appliances as the standard equipment. For low- and moderate –income customers, in addition to the suggestions highlighted in the section above, Massachusetts could look to use add-on or bonus incentives targeted specifically at encouraging participation by affordable housing property tenants or owners and developers as well as projects that embrace innovation to achieve performance levels that approach true net-zero energy or “zero utility bill” housing. Additionally, NEEP suggests the state, alongside utilities, program implementers, and contractors, identify workforce certification requirements and training requirements to ensure a reliable and trained workforce exists across the state.

### **Mass Save Cost-Benefit Calculations for GWSA Compliance**

NEEP applauds the interim CECP for acknowledging the significance of including long-term GWSA compliance goals in all program cost benefit calculations. With Mass Saves, Massachusetts has a nation leading energy efficiency portfolio due to the state's innovation and forward thinking in both energy efficiency and clean energy policy. The state can retain this position by aligning the cost-benefits test with state decarbonization goals outlined in the GWSA.

Currently, Massachusetts uses the TRC calculation and requires all costs of complying with foreseeable environmental regulations and non-energy benefits including: a low income economic development adder, thermal and noise comfort, health benefits and improved safety, and property value. While Massachusetts' test



does account for non-energy benefits and “foreseeable environmental regulations” this may not align with long-term GWSA compliance, NEEP recommends that state look to follow the procedures laid out in the [National Standards Practice Manual \(NSPM\)](#) to create a state specific test that encourages the development of carbon reduction goals and metrics in addition to demand reduction and energy storage goals for the energy efficiency program portfolio to guide effective strategic electrification. The NSPM provides a framework for establishing a state specific test based on sound economic and regulatory practices.<sup>4</sup>

In addition to fully accounting for decarbonization goals of the Commonwealth, a state specific cost-benefit test is another avenue where the state can drive investment in low- and moderate- income areas. By fully accounting for the benefits these residents receive in a benefit-cost test (health, safety, comfort, increased property values, indoor and outdoor air quality, and economic development) utilities and other program implementers will be driven to tailor more programs to these underserved sectors. Massachusetts can also consider creating a low- or moderate- income exception from the cost-benefit test. Such an exception would recognize that while these programs sometimes cost more, intangible benefits of implementing them may not be considered in the current state test.

## Performance and reporting standards and requirements for large, commercial, and industrial buildings;

NEEP applauds the EEA for identifying the significance of performance and reporting standards for buildings as a key part of the Commonwealth’s decarbonization strategy. Building performance standards (BPS) are a strategy to actively reduce emissions from the existing building stock beyond benchmarking and labeling and are the counterpart to building energy codes, which target new construction. Many states and cities in the Northeast and around the country are developing performance standards as a way to reduce GHG emissions and meet climate decarbonization goals. In Massachusetts, Boston and Cambridge are in the process of developing and implementing nation-leading city-wide BPS programs. On the state level, NEEP is aware of at least two bills, to be introduced this session, which will outline requirements for the establishment of a statewide BPS program.

For implementation of performance and reporting standards, NEEP recommends utilizing a phased approach, beginning with larger buildings and moving to smaller ones over time. This approach allows the market to develop and the education and awareness level to grow as more and bigger buildings are included. Such a program should be implemented as soon as possible and include all buildings above a 15,000 square foot threshold by 2028-2030.

Implementation of a statewide performance and reporting standard will require the tracking of a large number of buildings. To effectively manage the program, NEEP recommends using a database tool to help track and monitor compliance on a city and state level. NEEP offers a tool called the [Building Energy Analysis Manager](#)

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<sup>4</sup> National Standard Practice Manual for Benefit Cost Analysis of Distributed Energy Resources, National Energy Screening Project, August 2020, available at [https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-Summary\\_08-24-2020.pdf](https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-Summary_08-24-2020.pdf).



[\(BEAM\)](#), which can help in this process. BEAM is a flexible tool for importing, streamlining, and tracking benchmarked data and can be used to implement a building performance standard. To help in implementation of a performance standard, BEAM incorporates a jurisdiction specific benchmarking or BPS policy, automatically tracks and sorts for compliance, and incorporates a simple Corporate Relations Manager (CRM) to provide easy communication between groups of building owners. BEAM is developed in collaboration with ClearlyEnergy with funding from the U.S. Department of Energy (D.O.E.) and guidance from an Advisory Committee composed of state and local officials.

An additional consideration to implementing a successful performance and reporting standard is the education and training of facility directors, building managers, and building owners. Traditional building management procedures are not always enough to effectively operate a high performance building and achieve the expected energy savings. NEEP recommends that the state look to develop a robust training and education program alongside implementation of performance standards. For example, the state could include a building operator certification requirement with the new standard that ensures a workforce to operate and manage the more sophisticated buildings. The D.O.E. has a number of approved certification programs listed on their website which could be used to develop the Massachusetts building operator workforce for this purpose. In addition, Strategic Energy Management, commonly offered through utility programs, is another tool that could be utilized to educate owners of large buildings on energy efficiency measures and efficient building management.

### **Transparency, benchmarking, labeling, and rental standards.**

Transparent disclosure of energy data is a powerful tool to incentivize efficient buildings as disclosing energy usage and rating data creates value when combined with multiple listing services and the real estate market. NEEP recommends implementing a residential labeling program that triggers at the time-of-listing. A time-of-listing trigger provides the potential homebuyer ample time to learn about the energy performance of a home before it is purchased. Further, providing real estate professionals with access to home energy information reveals the hidden benefits of energy efficiency. This enables sellers to better market and evaluate their properties. Finally, research has shown that building operating costs are often overlooked factors in the real estate market and yet can be the most expensive part of owning a building. Transparency in the utility costs of a home can allow renters and buyers to make more well-informed decisions regarding their new homes

Much like building performance standards, it is important to have tools to handle large amounts of data that will come with establishing benchmarking, labeling, and rental standards. In this case, NEEP recommends that the state have tools that can generate meaningful energy labels and act as a database to store, track, and analyze them. NEEP's [Home Energy Labeling information eXchange \(HELIX\)](#) is a residential labeling database platform for storing home energy labeling program data (home energy labels, certifications, solar PV, program data) and automatically populates the Multiple Listing Service (MLS) with homeowner approval. On a statewide basis, HELIX can also serve as the database of new construction and retrofits. HELIX's open architecture means that Massachusetts could add data fields that are relevant to the state's needs such as fuel type, system type, and the presence of mold/asbestos/ lead, much of which can be drawn from tax assessor data.



NEEP's tool, [Energy Estimator - Powered by HELIX & ClearlyEnergy](#) is a tool that easily generates and stores customizable home energy labels by homeowners or contractors. The tool combines automated energy modeling capabilities from ClearlyEnergy with data from publicly-available tax assessor databases and from HELIX to generate projected annual energy usage and costs and provides resources, and recommendations for efficiency measures, and actions that can be taken to reduce energy usage. Due to its customizable nature, Energy Estimator is designed to operate independently or to support both remote assessments of homes and on-site assessments such as Home Energy Score. Most recently, NEEP has been working with Vermont to create a Vermont-specific energy label known as the Vermont Home Energy Profile.

As mentioned in Section B1 under "Utility Business Model Modifications to Accelerate Building Codes and Appliance Standards", identifying savings attributions is necessary to align utility action. The HELIX database can track residential program implementation and help utilities attribute energy savings to program expenditures. Both HELIX and Energy Estimator could provide customizable solutions for Massachusetts to establish energy labeling programs and track savings attribution. The [2019 Regional Residential Energy Labeling Action Plan](#) is a great resource for jurisdictions looking to implement a successful home energy labeling program.

## Conclusion

NEEP hopes these comments will help design and implement decarbonization policy to set the state on the path to achieve their decarbonization goals equitably and affordably. These comments are intended to support the work currently underway with the CECP 2030 report and 2050 Decarbonization Roadmap and we appreciate the opportunity to provide input. In addition, NEEP would like to offer technical expertise as part of Strategy B3: Convene the Commission and Task Force on Clean Heat and Cap Heating Fuel Emissions.

Sincerely,

A handwritten signature in black ink that reads "Erin Cosgrove".


Erin Cosgrove, Esq.  
Public Policy Manager  
Northeast Energy Efficiency Partnerships  
ecosgrove@neep.org

A handwritten signature in black ink that reads "Andy Winslow".

Andrew Winslow  
Public Policy Associate  
Northeast Energy Efficiency Partnerships  
awinslow@neep.org

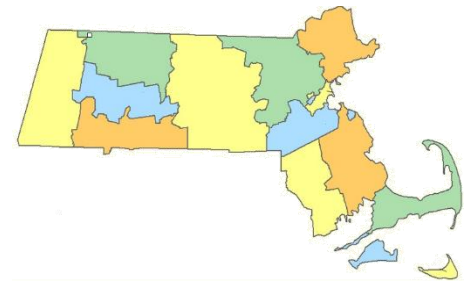




Make Massachusetts a leader 

March 22, 2021

Secretary Kathleen A. Theoharides  
Executive Office of Energy & Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114



Dear Secretary Theoharides:

We are writing to ask the Administration to develop a program (such as [HD 3466](#)), being proposed by Representative Michelle Ciccolo) to incentivize cities and towns in transitioning away from using landscape maintenance equipment powered with internal combustion engines. Advances in battery electric technology for landscape equipment is following in the path of electric vehicles. Today, all routine maintenance can be performed with battery electric-, robotic-, and people-powered equipment. As for electric vehicles, incentives are essential to accelerate adoption and scale-up use.

Land care today depends heavily on gas-powered equipment powered by 2-stroke engines (blowers, trimmers, chainsaws, etc) and 4-stroke mowers, including large industrial mowers. These are used routinely and frequently around neighborhoods, schools, parks, and other spaces. Many workers are Hispanic/Latino who are exposed day in and day out to harmful noise and pollution.

- Noise from gas-powered commercial land care equipment is **literally deafening**, exceeding occupational and public safety levels established by OSHA, the EPA, and the World Health Organization. Workers are at particularly high risk for hearing loss and non-hearing health problems, like cardiovascular disease. [A strong low frequency component](#) characteristic of many gas-powered engines, allows harmful levels of sound to carry over long distances and penetrate into homes and buildings.
- [An analysis of the national emission inventory database](#) shows that lawn and garden equipment emit large volumes of toxic and carcinogenic exhaust, including **ozone-forming chemicals and fine particulate exhaust**. This exhaust is produced at ground level and easily inhaled by workers and passers-by.
  - A state-specific sub-analysis shows that lawn and garden equipment in MA accounts for nearly 10,000 tons per year of ozone-forming exhaust; 500 tons per year of fine particulate matter, 120,000 tons of carbon monoxide, and 0.6 million tons of carbon dioxide.
- Workers are chronically affected by equipment vibration and exposure to toxic chemical solvents related to equipment refueling and maintenance.
- Spillage of fuel from re-fueling mowers alone was estimated (in the 1990s) at more than 17 million gallons annually – contaminating soil and water.
- Non-recyclable toxic and solid waste from maintaining gas equipment is dumped into landfills.

A sustained transition requires not only incentives but education and training in new technologies, infrastructure, and operational parameters. Municipal, public lands, university, and public school district models exist across the country. Here in Massachusetts, Eco-Quiet Lawn Care in Concord, MA is a local business success story (see [video](#)). The Town of Lexington, Walden Pond, Turners Falls Airport, and the University of Massachusetts (Amherst, Lowell) are also in the process of transitioning. [Robotics](#) are emerging to augment manpower shortages and are replacing low skill jobs with higher paid, tech-focused jobs. Today, hundreds of landscaping companies operate without fossil fuel-powered equipment and the sector is growing.

[Quiet Communities, Inc.](#) (QCi; Lincoln, MA) is a national 501c3 organization dedicated to helping communities improve health and reduce environmental harm from noise and pollution. Our organization consists of medical, scientific, and



legal professionals who take an evidence-based approach to solving problems of noise and related pollution with innovative, forward-thinking solutions. Through our [Quiet Outdoors](#) program, we work with municipalities, parks, state agencies, and schools in MA and across the nation. Together with our collaborator, [AGZA](#) (American Green Zone Alliance), we worked with MA's Operational Services Division on the nation's first technical specification for commercial battery electric land care equipment, organized state workshops, and provided technical assistance to the Town of Lexington, Walden Pond, and the Department of Transportation – see [Final Report](#).

This is an opportunity for the Commonwealth to strengthen its leadership position in clean, sustainable land care and benefit from a quintuple win:

1. Improving worker health;
2. Improving health and quality of life for the public;
3. Diminishing damage to ecosystems and biodiversity;
4. Building a clean, green jobs economy; and,
5. Contributing to carbon reduction goals.

**The required investment is small. The benefits and optics are large.**

With a relatively small investment, we are certain the Commonwealth can create a successful program and establish itself as a regional and national leader.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jamie L. Banks', is written over a horizontal line.

Jamie L. Banks, PhD, MS  
Founder and President  
[jamie@quietcommunities.org](mailto:jamie@quietcommunities.org)  
781.259.1717



Via Electronic Email and [Online Portal](#)

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
[gwsa@mass.gov](mailto:gwsa@mass.gov)

**Subject: Comments on the Interim Clean Energy and Climate Plan for 2030 from members of the GWSA IAC Climate Justice Working Group**

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

Thank you for the opportunity to comment on the Draft Interim Clean Energy and Climate Plan (CECP) for 2030.

As members of the Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC) Climate Justice Working Group (CJWG), the undersigned organizations are committed to ensuring that the Commonwealth is on target to achieve 2030 and 2050 greenhouse (GHG) emission reductions while also ensuring targeted benefits to environmental justice (EJ) populations and other historically marginalized communities.

Since first forming in November of 2019, the CJWG has sought to help define equity and climate justice for the IAC and EEA specifically in the context of state climate planning and as a primary consideration in evaluating GWSA policy, the Roadmap to 2050, and the CECP for 2030. As a working group and within the IAC, we have discussed at length the importance of prioritizing and anchoring the work in equity and justice, of supporting a people-centered approach to policy making, program design and implementation, and of taking a holistic approach to achieving climate goals, net zero by 2050, and overall GWSA compliance. However, metrics that evaluate progress towards achieving equity and introducing accountability are the underpinning of successfully establishing and attaining an equitable path to net zero.

Toward that end, we submit these comments, informed by the accompanying report prepared on behalf of the CJWG by Applied Economics Clinic (AEC), to provide specific guidance for how progress towards achieving the equity and climate justice goals of our work group's six policy priorities can and should be tracked, measured, and evaluated (see Appendix A). The AEC report, *An Initial Assessment of the Climate Justice Working Group's Recommended Policy Priorities - Tracking Equity and Justice*, also includes "a discussion of the importance of setting measurable, actionable equity goals that include clear standards for community engagement in the Massachusetts 2030 CECP."

### **CJWG Policy Priorities & Proposed Metrics**

The CJWG policy priorities were included as part of a comprehensive memo overwhelmingly supported by the IAC in October 2020 and detailing guiding principles, cross-cutting policies, and sector specific recommendations. The working group's policy priorities reflect a desire to enable a clean energy transition anchored in equity and capable of contributing to improved community health and economic opportunity for all.

#### ***Policy Priority 1: Set annual air pollution reduction targets for pollution hotspots.***

Presently, pollutants known to be extremely damaging to human health -- black carbon, ultrafine particulate matter, and nitrogen oxides -- are not comprehensively monitored or tracked. These pollutants must be monitored to establish a baseline and targets must be established requiring improvement by 2030 to mitigate air pollution to the degree necessary to improve air quality and protect the health of Massachusetts' most vulnerable residents.

***Policy Priority 2: Require diverse hiring and workforce development practices across all sectors to achieve quality jobs.*** Opportunities for economic growth and investments in workforce development are a primary focus of both the post-COVID-19 recovery and the clean energy transition nationally and throughout the Commonwealth. For Massachusetts to fully realize its commitment to a just transition that fosters pathways out of poverty and entry into the green economy for historically marginalized residents, state agencies must be deliberate in their coordination around workforce development and effort must be made to meaningfully prioritize job training, state contracting policies, and hiring practices that will enable greater diversity and representation in the state's clean energy sector.

***Policy Priority 3: Ensure that community engagement is reflected in and influences state decision-making.*** For policy and program planning and implementation to be transparent and inclusive, participation along the way must be open, accessible, and representative. Additionally, in an effort to introduce a level of accountability to impacted communities and to avoid tokenizing processes or participants, community feedback should be recognized, responded to, and reflected in final decision making. Efforts should be made to ensure membership of any and all advisory bodies is diverse and inclusive, beginning with representatives of the populations whose needs the advisory body has been convened to meet. In state decision-making, EEA should fully leverage the EJ Advisory Council and engage this body in decisions regarding each sector addressed in the CECP. State agencies should re-examine how stakeholdering is undertaken and how

public input is gathered, considered, and reflected. This will require the ability to provide two-way language interpretation at public meetings and in state-led webinars and public feedback sessions.

***Policy Priority 4: Prioritize climate investments in EJ populations.*** An equitable response to climate change can not be achieved through verbal commitments alone. Dollars must be directed and invested in a way that supports community-led planning and fosters climate-smart building, community resilience, and markedly increased access to clean energy solutions than currently exists for EJ populations and communities most vulnerable to climate change. Existing data should be utilized to direct and track targeted investments and set a threshold for investments in EJ populations and climate vulnerable communities. Establish a new, representative advisory body or leverage the EJ Advisory Council to help guide funding allocations. Barriers to program participation and technology adoption that prevent EJ populations from benefiting from the clean energy transition can be addressed, in part, through innovative approaches to financing and cross-sector collaboration, but the process will necessarily be iterative.

***Policy Priority 5: Redress harm of long-standing environmental, energy and development policies that have burdened EJ populations and other vulnerable residents.*** Investments in clean energy and climate measures made to address environmental, health, and energy burdens imposed on EJ populations and other climate vulnerable residents should not induce displacement. Instead, processes should include measures to ensure that communities do not turnover as a result of environmental, energy, housing, and economic improvements tied to CECP implementation. Further, all environmental, energy, and development projects that receive state funding should contribute to making housing within their vicinity more affordable.

***Policy Priority 6: The burdens of existing energy infrastructure must be reduced for nearby residents and workers. Additionally, ensure that increased clean energy investments do not increase the energy burden in low-to-moderate income communities and EJ populations.*** The Commonwealth must acknowledge that existing energy infrastructure disproportionately burdens EJ populations. The Commonwealth agencies should evaluate existing operating permits to see if more stringent conditions can be applied to reduce burdens on nearby residents and workers.

The Commonwealth should establish target deadlines to close polluting facilities, such as incinerators, fossil-fuel power plants, and other facilities that create a public health burden, especially for environmental justice populations and other historically marginalized communities. Further, the Commonwealth should also aim to reduce the energy infrastructure burden in EJ populations when siting new energy infrastructures. Utility rate design must incorporate analysis of environmental burdens. Utility rates must be monitored to ensure rates decrease or are stabilized for LMI communities during the transition.

Future electric and gas distribution system infrastructure should not be sited in EJ populations, except after cumulative impact reviews for projects proposed in EJ

populations that include consideration of potential public health impacts and long-term harms, as well as meaningful community engagement processes wherein community concerns and ideas inform and influence decision-making starting at the initiation of the project proposal process.

### **Conclusion**

The final CECP for 2030 will establish an important framework to guide decarbonization in the Commonwealth, helping to determine the clean energy trajectory Massachusetts embarks upon to achieve net zero by 2050. Metrics are the building blocks of success, a success that will not only be measured by our ability to achieve deep GHG emission reductions, but also by our ability to do so in a way that benefits EJ populations and other historically marginalized communities and those at risk of the most adverse effects of climate change.

We offer these recommendations as a starting point for what should be reflected in the plan to measure progress towards this shared goal. We avail ourselves to EEA to delve more deeply into what has been proposed, to collaborate on additional metrics, and to finalize and implement a robust clean energy and climate plan designed to establish an equitable and transformational path to net zero emissions.

For questions about these comments, please contact Eugenia Gibbons ([egibbons@hcwh.org](mailto:egibbons@hcwh.org)) and Staci Rubin ([srubin@clf.org](mailto:srubin@clf.org)), CJWG co-chairs.

Thank you and best regards,

Sofia Owen, Staff Attorney, Alternatives for Community & Environment  
Cindy Luppi, New England Director, Clean Water Action  
Sabrina Davis, Fall River Organizer, Coalition for Social Justice  
Staci Rubin, Senior Attorney, Conservation Law Foundation  
Maria Belen Power, Associate Executive Director, GreenRoots  
Eugenia Gibbons, Massachusetts Director of Climate Policy, Health Care Without Harm  
Andrea Nyamekye, Co-Executive Director, Neighbor to Neighbor MA  
Claire Muller, Movement Building Director, Unitarian Universalist Mass Action

## Appendix A

Applied Economics Clinic Report

*An Initial Assessment of the Climate Justice Working Group's Recommended Policy Priorities -  
Tracking Equity and Justice*

# Initial Assessment of the Climate Justice Working Group's Recommended Policy Priorities—Tracking Equity and Justice

March 2021

Applied Economics Clinic

Prepared on behalf of:

Conservation Law Foundation, Health Care Without Harm, Neighbor to Neighbor, Alternatives for Community and Environment, GreenRoots, Coalition for Social Justice, Clean Water Action, and Unitarian Universalist Mass Action

Authors:

Bryndis Woods, PhD

Elizabeth A. Stanton, PhD



Applied Economics Clinic  
Economic and Policy Analysis of Energy, Environment and Equity





## Executive Summary

The Climate Justice Working Group (CJWG) was created in November 2019 by the Massachusetts Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC) and provides direction to Massachusetts in meeting its climate goals while ensuring benefits for environmental justice (EJ) and historically marginalized communities. This Applied Economics Clinic report—prepared on behalf of Conservation Law Foundation, Health Care Without Harm, Neighbor to Neighbor, Alternatives for Community and Environment, GreenRoots, Coalition for Social Justice, Clean Water Action, and Unitarian Universalist Mass Action, members of the CJWG—describes how progress could be tracked, measured and evaluated for each of CJWG’s six policy priorities by recommending specific metrics to evaluate their equity and justice impacts. CJWG’s policy priorities include:

- addressing pollution hotspots;
- promoting diverse workforce development;
- ensuring community engagement influences state decision-making;
- prioritizing investments in EJ populations;
- redressing long-standing environmental harms; and
- reducing energy system burdens for EJ and other historically marginalized communities.

This report also includes a discussion of the importance of setting measurable, actionable equity goals that include clear standards for community engagement in the Massachusetts 2030 Clean Energy and Climate Plan (2030 CECP).

Measuring equity impacts requires disaggregated data that track EJ populations and other historically marginalized communities—a key challenge in producing useful metrics. In addition, CJWG’s six policy priorities push the Commonwealth to the next level on issues of equity and justice. Although much of the data needed for the metrics recommended in this report do not exist at present, they could be collected with adequate time and resources. This report draws attention to the additional efforts that will be required to measure progress towards equitable and just community impacts of climate policy. For example, among this report’s recommendations are: expanding the Commonwealth’s air monitoring system; establishing new advisory councils; creating new diversity, representation and funding standards; and implementing new databases and tracking systems. If Massachusetts’ equity and justice goals are to be more than just lip-service, they must include concrete, specific plans and actionable metrics to facilitate their evaluation and meaningful community engagement to ensure accountability and transparency.



The recommendations contained in this report are not intended to be prescriptive: They are intended as a starting point for discussions regarding what types of data collection, community involvement and public policy actions will be required to measure progress towards equity goals in the Commonwealth.



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## Introduction

The Massachusetts Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC) voted to approve the development of a Climate Justice Working Group (CJWG) in November 2019. The CJWG provides direction to Massachusetts in meeting its climate goals “while ensuring targeted benefits to environmental justice [EJ] populations and other historically marginalized communities.”<sup>1</sup>

The CJWG developed recommendations to the Executive Office of Energy and Environmental Affairs (EEA) to inform its 2030 Clean Energy and Climate Plan (2030 CECP). In October 2020, the IAC overwhelmingly supported a memo to EEA detailing guiding principles, cross-cutting policies, and sector-specific recommendations, including those from the CJWG, and requested that these materials be included in the Draft CECP. In December 2020, EEA released its Interim 2030 CECP for public comment. Based on input from prepared on behalf of Conservation Law Foundation, Health Care Without Harm, Neighbor to Neighbor, Alternatives for Community and Environment, GreenRoots, Coalition for Social Justice, Clean Water Action, and Unitarian Universalist Mass Action—members of the CJWG—this Applied Economics Clinic report defines and describes how progress could be tracked, measured and evaluated for each of the CJWG’s six policy priorities (see Table 1) and recommends specific metrics to evaluate their equity and justice impacts. This report also includes a discussion of the importance of setting measurable, actionable equity goals that include clear standards for community engagement in the 2030 CECP.

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<sup>1</sup> Climate Justice Working Group. February 24, 2020. *Climate Justice Working Group Memorandum*. Written to the Global Warming Solutions Act Implementation Advisory Committee. Available at: <https://www.mass.gov/doc/gwsa-iac-climate-justice-working-group-memo/download>.



**Table 1. CJWG’s six policy priorities**

<b>1) Set annual air pollution reduction targets for pollution hotspots</b>
<b>2) Require diverse hiring and workforce development practices across all sectors to achieve quality jobs</b>
<b>3) Ensure that community engagement influences state decision-making</b>
<b>4) Prioritize climate investments in EJ populations</b>
<b>5) Redress harm of long-standing environmental, energy, and development policies that have burdened EJ populations and other vulnerable residents</b>
<b>6) The burdens of existing and future energy infrastructure must be reduced for nearby residents and workers. Additionally, ensure that increased clean energy investments do not increase the energy burden in LMI and EJ communities.</b>

Source: CJWG. October 26, 2020, GWSA Implementation Advisory Committee Guiding Principles, Cross-cutting policy priorities, and sector-specific policy priorities for the 2030 Clean Energy Climate Plan, <https://www.mass.gov/doc/iac-work-group-proposed-guiding-principles-and-policy-priorities-updated-10262020/download>.

Some CJWG policy priorities recommend establishing new advisory councils, however, the precise form and function of the new advisory councils recommended in this report remains to be determined. Many of the equity metrics recommended in this report would entail the collection of new data that would be better suited to measure equity impacts of policy. However, collecting data that are compatible with tracking distributive, equity-related policy impacts entails privacy concerns because collection of these data cannot help but identify and facilitate tracking of environmental justice (EJ) populations and other historically marginalized communities. Data privacy concerns can be mitigated using deliberate and transparent methods that put decision-making about privacy in the hands of individuals and communities with the greatest concerns. Methods that help to ensure data privacy include: self-reporting group affiliation, anonymous data collection techniques, or data privacy protocols.

CJWG’s policy priorities are intended to push the Commonwealth’s environmental justice efforts further than they have gone before (and further than Massachusetts Senate Bill 9, An Act Creating



a Next-Generation Roadmap for Massachusetts Climate Policy,<sup>2</sup> which strengthens the legal standing for EJ populations). As a result, almost all of the data needed for metrics recommended in this report do not currently exist or are not publicly available, but could be collected and/or made publicly available given considerable time and resources. The recommendations contained in this report are not intended to be prescriptive; they are intended as a starting point for discussions regarding what types of data collection, community involvement and public policy actions will be required to measure progress towards equity goals in the Commonwealth. If Massachusetts equity goals, including those specified in the 2030 CECP, are to be more than just lip-service, it is of vital importance that they be formalized with concrete, specific plans that meaningfully engage the community and actionable metrics to facilitate their evaluation.

## CJWG's policy priorities

### 1. Set annual air pollution reduction targets for pollution hotspots

*To fully account for health impacts/co-benefits of proposed policies, agencies need to expand the air monitoring network, actively analyze air monitoring data, and consistently review environmental and energy policies to assess what is working and what needs to be tweaked to achieve air quality improvement.<sup>3</sup>*

#### a) Recommended metric: Establish new air monitoring stations in environmental justice populations and other historically marginalized communities

Yes/no metric: Have air monitoring stations been added to every community?

Massachusetts Department of Environmental Protection (MassDEP) tracks air pollution throughout the state using 23 air monitoring stations (see Figure 1).<sup>4</sup> Data collected by these stations are used to create an air quality index that provides local data on the concentration of harmful local air pollutants (called criteria pollutants): particulate matter (a catch-all category for any pollution particles suspended in the air that can get breathed into the lungs), ground-level ozone, lead, carbon monoxide, nitrogen oxides (NOx), volatile organic compounds, black carbon and sulfur

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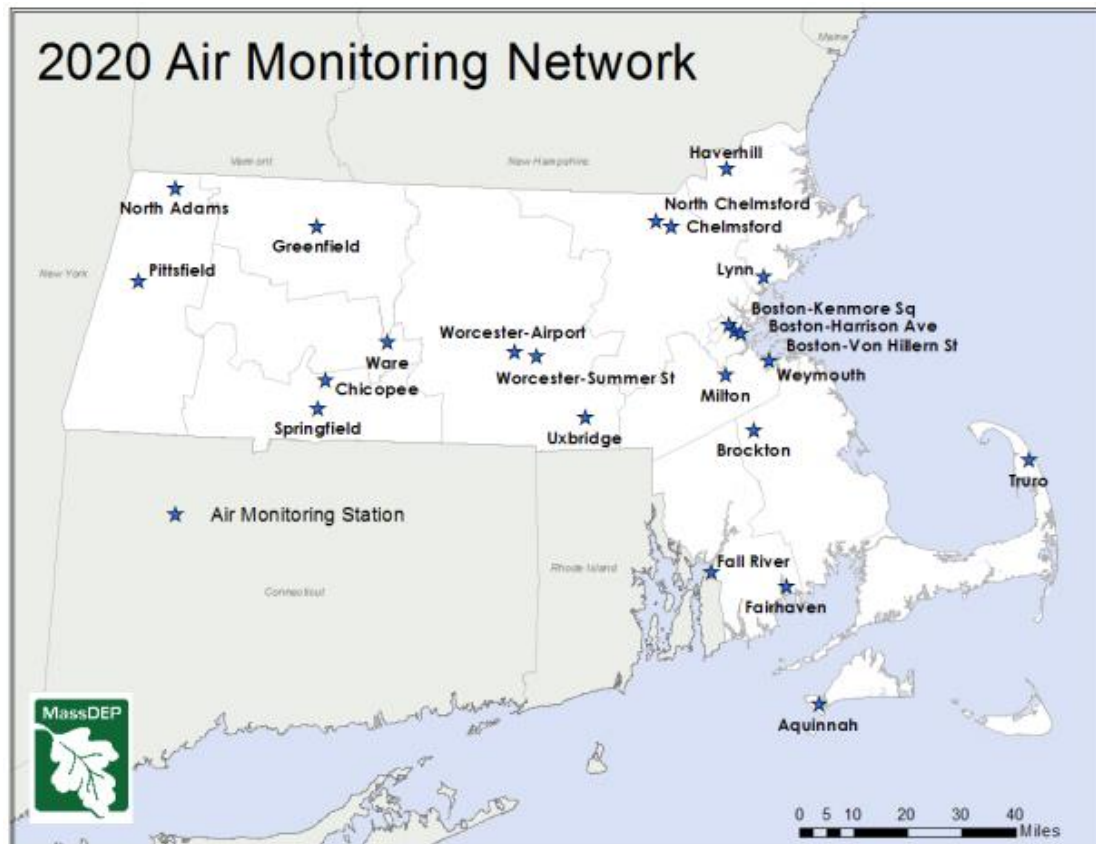
<sup>2</sup> The 192nd General Court of the Commonwealth of Massachusetts. 2019-2020. *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*. Bill S.2995. Available at: <https://malegislature.gov/Bills/191/S2995>.

<sup>3</sup> GWSA IAC. September 28, 2020. *GWSA IAC CJWG Refined List of Preliminary Recommendations*. Available at: <https://www.mass.gov/doc/iac-climate-justice-work-group-policy-priorities/download>.

<sup>4</sup> MassDEP. 2020. *MassDEP Ambient Air Quality Monitoring Network & Annual Plan*. Available at: <https://www.mass.gov/service-details/massdep-ambient-air-quality-monitoring-network-annual-plan>.

dioxide.<sup>5</sup> In total, there are 14 specific pollutants that are tracked by air monitoring stations, though no station measures all 14—the greatest number of pollutants tracked is 11 (at the Boston air monitoring station on Harrison Avenue in Roxbury) and the smallest number of pollutants tracked is 1 (at the Fairhaven, North Chelmsford and Uxbridge air monitoring stations).

**Figure 1. 2020 MassDEP Air Monitoring Network**



Source: Reproduced from MassDEP. August 7, 2020. Draft Massachusetts 2020 Air Monitoring Network Plan. p.5. Available at: <https://www.mass.gov/doc/draft-2020-annual-ambient-air-quality-monitoring-network-plan/download>.

MassDEP also has the regulatory authority to enforce the Commonwealth’s Ambient Air Quality Standards by tracking air quality and granting or denying air permits accordingly.<sup>6</sup> Per the Clean Air Act, each year, MassDEP submits air quality data to the U.S. Environmental Protection Agency (EPA)<sup>7</sup> for review using its standards (known as National Ambient Air Quality Standards, or

<sup>5</sup> U.S. Environmental Protection Agency. October 2015. *Environments and Contaminants: Criteria Air Pollutants*. Available at: [https://www.epa.gov/sites/production/files/2015-10/documents/ace3\\_criteria\\_air\\_pollutants.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/ace3_criteria_air_pollutants.pdf).

<sup>6</sup> MassDEP. June 14, 2019. *310 CMR 6.00: Ambient Air Quality*. Available at: <https://www.mass.gov/doc/310-cmr-600-ambient-air-quality-standards>.

<sup>7</sup> Ibid.



NAAQS), which establish limits on the concentration of pollutants in the air to protect public health, including “protecting the health of ‘sensitive’ populations such as asthmatics, children, and the elderly.”<sup>8</sup>

While both federal NAAQS and existing Massachusetts Ambient Air Quality Standards<sup>9</sup> are intended to safeguard public health,<sup>10</sup> these limitations have ultimately failed to mitigate air pollution to the degree necessary to protect Massachusetts’ most vulnerable households and communities from the worst impacts of the COVID-19 pandemic: In 2020, researchers at the Harvard T. H. Chan School of Public Health found a close relationship between air pollution and COVID-19 infection and mortality rates<sup>11</sup> and researchers from Harvard University and the University of Birmingham found that a substantially higher number of people died in 2018 from fossil fuel pollution (8 million) than earlier research had suggested (4.2 million).<sup>12</sup> Similarly, a May 2020 study from the Office of the Massachusetts Attorney General Maura Healey found that areas in the Commonwealth “with the lowest environmental quality are largely communities of color and current COVID-19 hot spots.”<sup>13</sup>

Since only the criteria pollutants are tracked to ensure compliance with federal and Massachusetts air quality standards, some pollutants that are damaging to human health are not comprehensively measured or tracked, such as black carbon, ultrafine particulate matter, and volatile organic compounds. Also called soot, black carbon is particulate matter formed when fossil fuels and/or biomass fuels are burned inefficiently for energy generation purposes—for example, black residue left behind in a fireplace.<sup>14</sup> Black carbon pollution results from car, truck, bus, rail, and port traffic,

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<sup>8</sup> U.S. Environmental Protection Agency. No date. "NAAQS Table". Criteria Air Pollutants. Available at:

<https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

<sup>9</sup> MassDEP. June 14, 2019. *310 CMR 6.00: Ambient Air Quality*. Available at: <https://www.mass.gov/doc/310-cmr-600-ambient-air-quality-standards>.

<sup>10</sup> 1) Ibid; 2) and U.S. Environmental Protection Agency. No date. "NAAQS Table". Criteria Air Pollutants. Available at:

<https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

<sup>11</sup> Center for Climate, Health, and the Global Environment. No date. “Coronavirus and Air Pollution.” *Harvard T.H. Chan School of Public Health*. Available at: <https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-pollution/#:~:text=For%20communities%20of%20color%2C%20air,of%20dying%20from%20Covid%2D19>.

<sup>12</sup> Burrows, L. February 9, 2021. “Deaths from fossil fuel emissions higher than previously thought.” *Harvard John A. Paulson School of Engineering and Applied Sciences*. Available at:

<https://www.seas.harvard.edu/news/2021/02/deaths-fossil-fuel-emissions-higher-previously-thought>.

<sup>13</sup> Office of Massachusetts Attorney General Maura Healey. 2020. *COVID-19’s Unequal Effects in Massachusetts*. Available at: <https://www.mass.gov/doc/covid-19s-unequal-effects-in-massachusetts/download>.

<sup>14</sup> Climate & Clean Air Coalition. No date. “Black Carbon”. Available at: <https://www.ccacoalition.org/en/slcsps/black-carbon>.





is found in the highest concentrations near roadways and ports,<sup>15</sup> and has been linked to serious health impacts, including respiratory conditions like lung disease, bronchitis, aggravated asthma and lower respiratory infections like pneumonia.<sup>16</sup> Volatile organic compounds are gases that are emitted by gasoline and diesel, wood burning and industrial processes that, in high enough quantities, can cause cancer and damage the nervous system and internal organs like the liver and kidneys.<sup>17</sup>

Massachusetts cannot track the impact of air pollution on EJ populations and other historically marginalized communities without increasing the number of air monitoring stations and increasing the number of monitoring stations measuring non-criteria pollutants like black carbon, ultrafine particulate matter, and volatile organic compounds.

**b) Recommended metric: Declassify environmental justice populations and other historically marginalized communities as “pollution hotspots” due to sustained lower air pollution levels**

Standard-setting metric: Set air quality standards for local pollutants and a hotspot declassification standard.

Pollution hotspot standards should be more stringent than NAAQs and may require updates to the Massachusetts Clean Air Act to ensure that standards<sup>18</sup> are based on the recommendations of public health experts, and could be measured relative to Massachusetts communities with the cleanest air. For example, the pollution hotspot standard could mandate that communities with high cumulative exposure burdens for toxic air contaminants and criteria pollutants have their air quality improved by setting annual targets to decrease air pollutants between 2023 and 2035, or until such time as their air quality is consistent with the best available science about the health risks of air pollution. Regardless of the standards set, the list of pollution hotspots should be reviewed and updated on an annual basis. To ensure that air quality improvements are true and

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<sup>15</sup> Environmental Law Institute. January 2020. *Reducing Indoor Exposure to Particle Pollution from Outdoor Sources*. Available at: <https://www.eli.org/sites/default/files/eli-pubs/web-reducing-indoor-exposure-particle-pollution-outdoor-sources.pdf>.

<sup>16</sup> Climate & Clean Air Coalition. No date. “Black Carbon”. Available at: <https://www.ccacoalition.org/en/slcps/black-carbon>.

<sup>17</sup> American Lung Association. February 12, 2020. “Volatile Organic Compounds.” Available at: <https://www.lung.org/clean-air/at-home/indoor-air-pollutants/volatile-organic-compounds>.

<sup>18</sup> MassDEP. 2019. *The Massachusetts Clean Air Act: (M.G.L. Chapter 111, Sections 142A-142J)*. Air Pollution Control Regulations: 310 CMR 6.00: Ambient Air Quality Standards; 310 CMR 7.00: Air Pollution Control; 310 CMR 8.00: Prevention & Abatement of Air Pollution Episodes & Emergencies; 310 CMR 60.00: Air Pollution Control For Mobile Sources. Available at: <https://www.mass.gov/regulations/310-CMR-600-ambient-air-quality-standards>.



sustained, pollution hotspots should not be declassified until their pollution threshold remains below “hotspot” levels for at least two consecutive years.

## **2. Require diverse hiring and workforce development practices across all sectors to increase access to/achieve quality jobs**

*The Commonwealth should allocate agency staff to work with an independent advisory council to oversee job creation. The jobs created through procurement, infrastructure projects, and implementation of climate policies should create a pathway out of poverty, with family-sustaining wages and benefits. The contract opportunities should advance women-, people of color-, and veteran-owned businesses and incentivize domestic and local quality job creation. Funding should be allocated for programs that directly recruit, train, and retain those underrepresented in the workforce, including women, people of color, veterans, formerly incarcerated people, and people living with disabilities. Training should also be provided for workers who need to learn new skills to support the just transition away from fossil fuels to clean energy.<sup>19</sup>*

### **a) Recommended metric: Establish an independent advisory council to oversee job creation from state policies (that is, jobs created through procurement, infrastructure projects, and implementation of climate policies)**

Yes/no metric: Has the advisory council been created?

At present, there is no dedicated body responsible for tracking or overseeing all jobs created by state climate and clean energy policy.

Voluntary self-identification survey: Do advisory group members belong to EJ populations and other historically marginalized communities (women, people of color, veterans, formerly incarcerated people, and people living with disabilities)? Is the council composition diverse and inclusive?

To maintain personal privacy, we recommend asking all advisory council members to voluntarily self-identify as a member of EJ populations and other historically marginalized communities as defined above.

### **b) Recommended metric: Work contracts created by climate and clean energy policies prioritize people of color, women, people living with disabilities, formerly incarcerated people, and veterans**

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<sup>19</sup> GWSA IAC. September 28, 2020. *GWSA IAC CJWG Refined List of Preliminary Recommendations*. Available at: <https://www.mass.gov/doc/iac-climate-justice-work-group-policy-priorities/download>.



Set diversity standards: The share of work contracts created by Massachusetts' climate and clean energy policy that are filled by people of color, women, people living with disabilities, formerly incarcerated people, and veterans should, at a minimum, reflect the share of those groups in the Commonwealth population as a whole.

Moving beyond the bare minimum would involve ensuring that the share of work contracts filled by EJ populations and other historically marginalized community groups reflect the share of those groups in the community where the work contract is to take place. For example, the Massachusetts Department of Transportation strengthened its diversity criteria for developers' bids for 1.3 acres on Kneeland Street in downtown Boston near South Station such that the diversity of the bidding team would account for 25 percent of its total score.<sup>20</sup> Other diversity requirements could include mandating respondents specify: their plans for training and workforce development; their plans to solicit business from minority and disadvantaged contractors; their plans to solicit investment from minority and disadvantaged contractors; and/or their plans to mitigate environmental harm and create economic opportunities. Once work contracts are awarded, winning bidders could be required to cooperate with the state Supplier Diversity Office and other state agencies to establish a process to provide regular updates about their progress towards their commitments.

Employment reporting by state contractors: Require reporting—within the bounds of applicable civil rights and antidiscrimination laws—by gender, race/ethnicity, veteran status, formerly incarcerated status and disability status to an independent advisory council to oversee job creation.

To maintain personal privacy, we recommend using anonymous data collection techniques and/or data privacy protocols such as multi-factor authentication, developing and maintaining incidence response plans, developing authorized user and access protocols and/or data encryption techniques. Jurisdictions around the country have passed legislation that establishes “limitations on the use of criminal background checks in employment and/or housing decisions,”<sup>21</sup> which makes it possible to identify formerly incarcerated individuals in a manner that is legal and does not expose them to discrimination.

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<sup>20</sup> Chesto J. February 24, 2021. “State toughens diversity criteria as it looks to divest prime downtown Boston site”. The Boston Globe. Available at: <https://www.bostonglobe.com/2021/02/24/business/state-toughens-diversity-criteria-it-looks-sell-prime-downtown-boston-site/>.

<sup>21</sup> Nelson J, et al. December 2016. *Racial Equity Toolkit*. Local and Regional Government Alliance on Race and Equity. December 2016. p.10. Available at: [https://www.racialequityalliance.org/wp-content/uploads/2015/10/GARE-Racial\\_Equity\\_Toolkit.pdf](https://www.racialequityalliance.org/wp-content/uploads/2015/10/GARE-Racial_Equity_Toolkit.pdf).



**c) Recommended metric: Jobs created by climate and clean energy policies meet minimum standards for a more diverse workforce**

Set diversity standards: The share of jobs created by Massachusetts’ climate and clean energy policy that are filled by women, people of color, veterans, formerly incarcerated people, and people living with disabilities should, at a minimum, reflect the share of those groups in the Commonwealth.

Not only should all workers across all sectors reflect the diversity of the Commonwealth, but this should also be true for the workers within a specific sector or company—it is equally important for equity that representation is present across sectors as well as across job types and job hierarchies.<sup>22</sup> For example, women make up approximately half of the population of the Commonwealth; they should fill half of all jobs created by Massachusetts’ climate and clean energy policy, they should fill half of all jobs within each sector, and they should fill half of all jobs across job types and job levels. Policies and employee benefits should also reflect efforts to retain a diverse workforce. For example, offering parental leave and accommodations to those living with disabilities.

Employment data: Track workers by: women, people of color, veterans, formerly incarcerated people, and people living with disabilities.

Currently, the Massachusetts Executive Office of Labor and Workforce Development manages the Commonwealth’s workforce development and labor departments and oversees tools and training for workers, employers and the unemployed.<sup>23</sup> Massachusetts employment data are tracked by the Massachusetts Department for Unemployment Assistance.<sup>24</sup> These data exist by sector and occupation, but not by income group, race/ethnicity, gender, or veteran status. Data made available by the U.S. Census Bureau track the annual employment status by race/ethnicity, gender, and age but do not include occupations or job sector classifications. In addition, the Massachusetts Clean Energy Center (MassCEC)—a quasi-public state agency that aims to accelerate the growth of the clean energy sector and spur job creation for the people of Massachusetts<sup>25</sup>—tracks workforce

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<sup>22</sup> Ibid.

<sup>23</sup> Executive Office of Labor and Workforce Development. No date. “Labor and Workforce Development agencies”. Available at: <https://www.mass.gov/orgs/executive-office-of-labor-and-workforce-development>.

<sup>24</sup> Massachusetts Department for Unemployment Assistance tracks data from Local Area Unemployment Statistics, Current Employment Survey, the Occupational Employment and Wage Statistics, and Quarterly Census of Employment and Wages programs. Available at: <https://www.mass.gov/orgs/department-of-unemployment-assistance>.

<sup>25</sup> Massachusetts Clean Energy Center. No date. “About MassCEC”. Available at: <https://www.masscec.com/about-masscec>.



development in the Commonwealth. Although these data are not made available to the public at present, MassCEC produces workforce development reports—like a 2020 report on the Building Operator workforce<sup>26</sup> and a 2018 report on the Offshore Wind workforce.<sup>27</sup> Making existing data on workforce development publicly available raises privacy issues but, given anonymous data collection techniques and/or data privacy protocols (such as multi-factor authentication, developing and maintaining incidence response plans, developing authorized user and access protocols and/or data encryption techniques), would improve the ability to track workers from EJ populations and other historically marginalized communities. To be clear, it is not possible to use current employment data to track equity impacts.

In addition, there are significant data privacy concerns associated with identifying and tracking workers across EJ populations and other historically marginalized communities. Such privacy concerns can be mitigated using anonymous data collection techniques and/or data privacy protocols, like those mentioned above. EJ populations and other historically marginalized communities should be involved in decision-making regarding data privacy measures, to ensure that their concerns are addressed in decisions about how to safely and respectfully collect data.

**d) Recommended metric: Jobs created by climate and clean energy policies provide family-sustaining wages and benefits**

Set job quality standards: Ensure that jobs created by climate and clean energy policies provide family-sustaining wages and benefits that are higher than the current minimum wage in the Commonwealth.

Family-sustaining wages are higher than the minimum wage currently set by the Commonwealth. The Massachusetts Institute of Technology (MIT) offers a free, online “living wage calculator” that estimates the hourly wage needed for residents to meet minimum standards of living (i.e. procuring the goods and services necessary for their household’s health and well-being: food, child care, medical, housing, transportation, etc.) across different states, counties, cities and metro areas.<sup>28</sup> For example, MIT’s living wage for the Commonwealth of Massachusetts is \$15.46 per hour for an individual with no children, while the living wage for the same individual would be

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<sup>26</sup> BW Research Partnership. 2020. *MassCEC Building Operators Workforce Development Report*. Prepared for the Massachusetts Clean Energy Center. Available at: [https://files-cdn.masscec.com/blog/pdf/2020%20MassCEC%20Building%20Operators%20Workforce%20Development%20Report\\_Final.pdf](https://files-cdn.masscec.com/blog/pdf/2020%20MassCEC%20Building%20Operators%20Workforce%20Development%20Report_Final.pdf).

<sup>27</sup> Massachusetts Clean Energy Center. 2018. *2018 Massachusetts Offshore Wind Workforce Assessment*. Available at: <https://files.masscec.com/2018%20MassCEC%20Workforce%20Study.pdf>.

<sup>28</sup> MIT Living Wage Calculator. No date. “Living Wage Calculator.” Available at: <https://livingwage.mit.edu/>.



\$16.74 for the Boston-Cambridge-Newton metro area due to higher costs of basic living expenses. (MIT makes its living wage calculator technical documentation publicly available.<sup>29</sup>) Multiple cities—including Boston,<sup>30</sup> Somerville<sup>31</sup> and Cambridge<sup>32</sup>—have active ‘living wage ordinances’ that mandate hourly wages able to support a family for all city employees, contractors and subcontractors. The Massachusetts Prevailing Wage Law for contractors mandates minimum wage rates for workers on public construction projects, which are set by the Massachusetts Executive Office of Labor and Workforce Development, Department of Labor Standards by region and job type.<sup>33</sup> As of January 1, 2021, the minimum wage in the Commonwealth is \$13.50 per hour, which will increase to \$15 per hour in January 2023.<sup>34</sup>

**Employment data:** Track workers by gender, race/ethnicity, veteran status, formerly incarcerated status, and disability status, as well as by other demographic characteristics and compensation levels, including benefits.

Identifying and tracking workers across EJ populations and other historically marginalized communities, and the income/benefits of their jobs, entails significant data privacy concerns that can be mitigated using deliberate methods like anonymous data collection techniques, data privacy protocols (such as multi-factor authentication, developing and maintaining incidence response plans, developing authorized user and access protocols and/or data encryption techniques) and self-reporting.

**e) Recommended metric: Create green job training programs for workers at-risk from the transition away from fossil fuels**

<sup>29</sup> Glasmeier AK, Nadeau CA. February 3, 2021. *Living Wage Calculator: User’s Guide / Technical Notes*. Department of Urban Studies and Planning: Massachusetts Institute of Technology. Available at:

<https://livingwage.mit.edu/resources/Living-Wage-Users-Guide-Technical-Documentation-2021-02-03.pdf>.

<sup>30</sup> Salerno P. September 2, 1998. *The Boston Jobs and Living Wage Ordinance*. City of Boston. Available at:

[https://www.cityofboston.gov/TridionImages/livwageord\\_tcm1-693.pdf](https://www.cityofboston.gov/TridionImages/livwageord_tcm1-693.pdf).

<sup>31</sup> City of Somerville. May 4, 2020. “City of Somerville Code of Ordinances Section 2-397 et seq.” Somerville Living Wage Ordinance Certification Form. Available at: <https://www.somervillema.gov/sites/default/files/living-wage-ordinance-form-fy21.pdf>.

<sup>32</sup> City of Cambridge. November 5, 2015. “City of Cambridge Ordinance. Chapter 2.121”. Cambridge Living Wage Ordinance. Available at: <https://www.cambridgema.gov/-/media/Files/purchasingdepartment/forsitelaunch/livingwageordinanceupdated31416.pdf>.

<sup>33</sup> Mass.gov. 2021. “Massachusetts Prevailing Wage Law for Contractors.” Available at: <https://www.mass.gov/service-details/massachusetts-prevailing-wage-law-for-contractors>.

<sup>34</sup> Massachusetts Government. January 1, 2021. “Massachusetts law about minimum wage.” Available at: <https://www.mass.gov/info-details/massachusetts-law-about-minimum-wage#massachusetts-minimum-wage->



Set “at-risk worker” standards: Create a classification system for worker vulnerability from the transition away from fossil fuels.

At-risk workers include all workers in the coal, oil, motor vehicle, and gas sectors—but different workers within those sectors will have different levels of vulnerability to job loss. For example, entry-level workers are more likely to see their job eliminated than executives. In addition, some workers in sectors that are not directly involved with fossil fuels but especially reliant on them—like, for example, gas station workers and gas vehicle mechanics—will also be vulnerable.<sup>35</sup> Certain agricultural, forestry and ocean-dependent workers may also be vulnerable to job loss as climate change impacts accelerate and worsen.

Job data: Track existing jobs and job openings identified as “at-risk” for the purpose of targeting green job training programs at those who most need them.

Track participation in green job training programs: Offer green job training programs to at-risk workers, labor unions and apprenticeship programs and track participation in these programs.

**f) Recommended metric: Ensure zero net job losses from the transition away from fossil fuels in the state**

Employment data: Track jobs identified as “at-risk” from the transition away from fossil fuels.

Job data: Track existing jobs and job openings identified as “green” (currently compiled by MassCEC)—if they replace “fossil fuel related” jobs at a one-to-one rate, then net job losses are zero.

### **3. Ensure that community engagement influences state decision-making**

*All state advisory committees should include representation from EJ populations. The Environmental Justice Advisory Council should be routinely convened and invited to participate in decisions about transportation, electricity, buildings, nature-based solutions, development, and housing. Agencies should routinely engage in robust stakeholder processes to seek public input in advance of decisions.<sup>36</sup>*

**a) Recommended metric: All state advisory committees and state boards include (self-identified) representatives from EJ populations**

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<sup>35</sup> Saha D. May 19, 2020. “Ensuring a Fair Transition for US Fossil Fuel Workers in Economic Recovery”. World Resources Institute (WRI). Available at: <https://www.wri.org/blog/2020/05/coronavirus-fair-transition-fossil-fuel-workers>.

<sup>36</sup> GWSA IAC. September 28, 2020. *GWSA IAC CJWG Refined List of Preliminary Recommendations*. Available at: <https://www.mass.gov/doc/iac-climate-justice-work-group-policy-priorities/download>.



Set an EJ representation standard: EJ community leaders should be convened by the state to provide guidance regarding how to set EJ representation standards for all state advisory committees and state boards. Representation standards should reflect the guidance received from EJ community leaders.

Participation and EJ representation tracker: A new public database that tracks participants on state advisory committees, including current and former committee members, and tracks EJ representation via voluntary self-identification.

To maintain personal privacy, we recommend asking all advisory committee members to voluntarily self-identify as EJ representatives.

**b) Recommended metric: The Environmental Justice Advisory Council participates in state agency decisions regarding transportation, electricity, buildings, nature-based solutions, development and housing**

Participation reporting by all state agencies: Agencies should be required to report publicly on the participation of the Environmental Justice Advisory Council in decisions related to transportation, electricity, buildings, nature-based solutions, development, and housing.

**c) Recommended metric: All state agencies conduct stakeholder processes to get public input on planned decisions**

Set standards for inclusive stakeholder processes: Stakeholder demographics should, at a minimum, reflect statewide demographics regarding women, people of color, veterans, formerly incarcerated people, and people living with disabilities.

The population share of some of the underrepresented groups listed above, like women and people of color, is known from publicly available data. For other groups, it is not currently possible to know their share of the Commonwealth's population and further efforts will be needed to identify an adequate share of stakeholder representation. To maintain personal privacy, we recommend asking stakeholders to voluntarily self-identify as members of underrepresented groups that cannot be known from publicly available data, and to ensure these data are treated in a confidential manner. For EJ populations and other historically marginalized communities that have concerns about interaction with government, the use of trusted advocates and engagement





liaisons (such as community-based organizations) can be a useful strategy to secure stakeholders that are willing and able to participate.<sup>37</sup>

Stakeholder processes should ensure two-way language access in which interpreters are either familiar with the subject matter or briefed on the topic ahead of the meetings. Documents relevant to the process should be made available in the languages spoken in the community in question with adequate lead-time, for example, at least one week before a meeting is to take place. Public comment meetings should ensure that the bulk of meeting time is used for public comments. Stakeholder processes should require community meetings and hearings be held multiple times during different times of the day and different days of the week. For example, those working at night should be able to attend a morning meeting or a weekend meeting.

Inclusion/participation tracker: A new public database that tracks EJ inclusion and participation in state agency stakeholder processes.

Transparency in the recommendations made to and by stakeholders is critical: For example, make a list of stakeholders and their recommendations publicly available. This enables the Commonwealth to document and demonstrate how the stakeholder process works and how it influences the public processes.<sup>38</sup> For maximum inclusion and representation, stakeholders should be provided with multiple ways to engage, such as online and in-person participation options, written and oral feedback options, and smaller and larger group settings.<sup>39</sup> Outside of mandated quarantines, online hearings and meetings should supplement in-person participation, not replace it. Virtual meetings are an alternative method of engagement that may benefit some communities. Meetings and hearings should take place in the communities impacted by the project or proposal with options for both in-person and virtual engagement.

Financial incentive tracker: A new public database that tracks the availability and rate of utilization of financial incentives or reimbursements for participation in public boards, committees, and stakeholder processes.

Achieving EJ stakeholder involvement may require financial incentives because it is often very difficult, if not impossible, for EJ populations and other historically marginalized community members to allocate labor hours for which they are not paid and/or ensure their children are cared

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<sup>37</sup> Nelson J, Brooks L. December 2016. *Racial Equity Toolkit*. Government Alliance on Race and Equity. Available at: [https://www.racialequityalliance.org/wp-content/uploads/2015/10/GARE-Racial\\_Equity\\_Toolkit.pdf](https://www.racialequityalliance.org/wp-content/uploads/2015/10/GARE-Racial_Equity_Toolkit.pdf).

<sup>38</sup> Ibid.

<sup>39</sup> Ibid.



for while they participate. Unpaid participation is a particularly acute issue when EJ populations and other historically marginalized community members are expected to participate in meetings.

**d) Recommended metric: All state agencies must respond to stakeholder comments and explain how decisions incorporate public input**

Set standards for responses to stakeholder comments: Standards should include quantifying the percent of comments in support and against proposals that require state decision-making and specifying which recommendations were taken up, which were not, and the reasoning behind these decisions. Make this information publicly available in all languages spoken by the community or communities in question.

#### **4. Prioritize climate investments in EJ populations**

*When dollars are being directed to support development, a concerted effort should be made to a) prioritize investment in EJ populations that will enable climate-smart building and b) convene input from an advisory body that includes community and worker representation to guide how funding is allocated. Provide enhanced incentives and innovative financing for income-eligible customers, regardless of creditworthiness, to make new, clean technologies more accessible and affordable (e.g., EVs, air source heat pumps, solar panels, rides on regional electric rail).<sup>40</sup>*

**a) Recommended metric: Development dollars are directed to EJ populations for climate-smart building**

Existing tracking/classification of EJ populations: EJ populations and climate vulnerable populations are currently classified and tracked by various Massachusetts state agencies.

Currently, EEA tracks and makes publicly available a list of EJ populations, based on data from the 2010 U.S. Census and American Community Survey data;<sup>41</sup> new decennial Census data are unlikely to be available before 2022.<sup>42</sup> Created in 2017 as a result of Governor Baker's Executive Order 569,<sup>43</sup> the Municipal Vulnerability Preparedness (MVP) grant program certifies Massachusetts

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<sup>40</sup> GWSA IAC. September 28, 2020. *GWSA IAC CJWG Refined List of Preliminary Recommendations*. Available at: <https://www.mass.gov/doc/iac-climate-justice-work-group-policy-priorities/download>.

<sup>41</sup> MassGIS. September 29, 2016. "Environmental Justice Viewer". Available at: [http://maps.massgis.state.ma.us/map\\_ol/ej.php](http://maps.massgis.state.ma.us/map_ol/ej.php).

<sup>42</sup> MassDEP. No date. "Environmental Justice Populations in Massachusetts". Available at: <https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts>.

<sup>43</sup> Office of Governor Charlie Baker and Lt. Governor Karyn Polito. September 16, 2016. *Executive Order. No. 569: Establishing an Integrated Climate Change Strategy for the Commonwealth*. Massachusetts Government. Available at: <https://www.mass.gov/executive-orders/no-569-establishing-an-integrated-climate-change-strategy-for-the-commonwealth>.



municipalities as MVP communities with regard to climate,<sup>44</sup> which makes them eligible for MVP Action Grant funding<sup>45</sup> to conduct vulnerability assessments and develop climate resiliency plans. As such, the MVP program collects important data on climate vulnerable populations in the Commonwealth. The Massachusetts Department of Public Health is responsible for tracking and evaluating environmental health data “to identify health disparities among Massachusetts residents” and support “programs to reduce exposure to environmental hazards.”<sup>46</sup>

Public investment tracker: Track and make publicly available Massachusetts government dollars spent on climate and clean energy efforts by the location of the project (this might include both manufacturing and implementation locations). Tracking financial flows to EJ populations is made difficult by the fact that Massachusetts defines EJ populations as neighborhoods within cities rather than for entire cities or towns.<sup>47</sup>

It is important to mention Massachusetts Senate Bill 9, An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, as this Bill<sup>48</sup> strengthens the legal standing for EJ populations but does not create any new funding streams for EJ populations.<sup>49</sup>

Set an EJ funding standard: Set a relative standard for EJ populations funding that mandates a certain amount of investment in EJ populations, relative to investments made in non-EJ populations.

We recommend setting a relative standard. As an illustration: for every \$1 of funding that a non-EJ community receives, an EJ community should receive \$2 of funding. For example, the currently proposed *An Act Relative to Transportation and Environmental Justice* seeks to mandate that “[a] minimum of 70 percent of the annual [Transportation and Climate Initiative] proceeds shall be used to benefit underburden [sic] and underserved communities with an environmental justice population.”<sup>50</sup>

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<sup>44</sup> Executive Office of Energy and Environmental Affairs. November 1, 2020. *Municipal Vulnerability Preparedness Program*. Available at: <https://www.mass.gov/doc/municipal-designation-status-0/download>.

<sup>45</sup> Municipal Vulnerability Preparedness Program. No date. “MVP Action Grant”. Available at: <https://www.mass.gov/service-details/mvp-action-grant>.

<sup>46</sup> Massachusetts Department of Public Health. No date. “Environmental Health Data.” Available at: <https://www.mass.gov/environmental-health-data>.

<sup>47</sup> MassDEP. No date. “Environmental Justice Populations in Massachusetts”. Available at: <https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts>.

<sup>48</sup> Should the Bill become law.

<sup>49</sup> The 192nd General Court of the Commonwealth of Massachusetts. 2019-2020. *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*. Bill S.2995. Available at: <https://malegislature.gov/Bills/191/S2995>.

<sup>50</sup> The 192nd General Court of the Commonwealth of Massachusetts. February 19, 2021. *An Act Relative to Transportation and Environmental Justice*. Bill SD.2317. Available at: <https://malegislature.gov/Bills/192/SD2317>.



**b) Recommended metric: Establish an advisory body to guide funding allocation to EJ populations that includes community and worker representation**

Yes/no metric: Has the advisory body been created or is an existing advisory body—like the Environmental Justice Advisory Council—overseeing this work?

Voluntary self-identification survey: A survey in which advisory body members self-identify whether they belong to EJ populations and other historically marginalized communities, to affected communities, or hold affected jobs.

To maintain personal privacy, we recommend asking all advisory committee members to voluntarily self-identify as members of EJ populations and other historically marginalized communities, members of affected communities, or as holding an affected job. This information should be publicly disclosed as part of the advisory council member database recommended above.

**c) Recommended metric: Offer grants, financial incentives, and other financing options that are accessible regardless of creditworthiness for adoption of EVs, air source heat pumps, solar panels, and rides on regional electric rail**

Clean energy financing accessibility tracker: A new public database that tracks the availability and rate of utilization of financing for participant costs of clean energy projects. Offering these incentives would require reallocating funding for current incentives and/or collecting additional revenue. The MOR-EV program (which paid rebates up to \$2,500 for the purchase of a new electric vehicle) provides an example of how such grant programs can have inequitable impacts. The program’s published data demonstrate that it has primarily benefited households living in the wealthiest areas of the Commonwealth (including Lincoln, Harvard, Carlisle, Lexington, Weston and Concord).<sup>51</sup> Almost 80 percent of MOR-EV rebates have gone to communities where the household income is higher than the state median and only 9 percent went to communities where the median household income is lower than the state median. In addition, a full third of the program’s total expenditures supported the purchase of Tesla vehicles—a luxury car.<sup>52</sup>

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<sup>51</sup> MilNeil C. February 18, 2021. “Analysis: Bay State’s EV Rebate Program Overwhelmingly Benefits Wealthy Suburbanites”. Mass Streets Blog. Available at: <https://mass.streetsblog.org/2021/02/18/analysis-bay-states-ev-rebate-program-overwhelmingly-benefits-wealthy-suburbanites/>.

<sup>52</sup> MOR-EV. March 5, 2021. “MOR-EV Program Statistics”. Available at: <https://mor-ev.org/program-statistics>.



## 5. Redress harm of long-standing environmental, energy, and development policies that have burdened EJ populations and other vulnerable residents

*Projects receiving state funds must increase housing affordability. Any new incentives for solar projects must prioritize opportunities for ownership of renewable energy assets in historically disadvantaged communities.*<sup>53</sup>

### a) Recommended metric: All environmental, energy, and development projects that receive state funding make housing in their vicinity more affordable

Set housing affordability criteria: Projects could apply for “affordability enhancement” status based on one of several potential criteria (provides housing below a threshold rent, lowers other key costs for residents such as transportation or heating, etc.). Currently, Section 8 housing in Massachusetts serves over 22,000 households and 75 percent of households receiving this benefit are very low-income households (defined as less than 30 percent of Area Median Income (AMI)).<sup>54</sup> In addition, the Emergency Rental & Mortgage Assistance program can assist households with total gross household incomes of between 50 and 80 percent of AMI, and these standards differ by country or metro area.<sup>55</sup> The shortcomings of existing standards—that use AMI as a metric—include: AMI does not capture the totality of essential living expenses that households are paying (like the cost of food or transportation); using a firm AMI cutoff (i.e. no more than 30 percent, no more than 80 percent) leaves housing assistance out of reach for households living just above the threshold; and using the same AMI range for large areas of the state (for example, the Boston-Cambridge-Quincy Metro Area) means that households in towns and cities with drastically different median household incomes (for example, Boston versus Lynn) are applying for housing assistance according to the same AMI metrics.

State-funded project tracker: A new public database that tracks projects receiving state funds and the cost of nearby housing before and after project completion. For example, when projects are first proposed, information on the costs of nearby housing (rents, mortgages and home values) could be collected as a baseline. Once the project is built and operational the costs of nearby rental housing could be mandated to remain at the baseline (or no more than some percentage higher

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<sup>53</sup> GWSA IAC. September 28, 2020. *GWSA IAC CJWG Refined List of Preliminary Recommendations*. Available at: <https://www.mass.gov/doc/iac-climate-justice-work-group-policy-priorities/download>.

<sup>54</sup> Massachusetts Housing and Community Development. No date. “Section 8 Housing Choice Voucher Program (HCVP)”. Available at: <https://www.mass.gov/service-details/section-8-housing-choice-voucher-program-hcvp>.

<sup>55</sup> Massachusetts Housing and Community Development. No date. *Emergency Rental & Mortgage Assistance Program Income Guidelines*. Available at: <https://www.mass.gov/doc/erma-area-median-income-information/download>.



than the baseline to account for inflation) by way of rent freeze, rent stabilization, rent forgiveness or rent control mechanisms for a set period of time (for example, two years).

**b) Recommended metric: Energy burdens are reduced or are stabilized for low- and moderate-income households**

Yes/no metric: Have energy burdens (energy costs as a share of income) among low- and moderate-income (LMI) households (where low-income is defined as 0 to 60 percent of AMI and moderate income is defined as 61 to 120 percent of AMI) remained stable or been reduced as the Commonwealth’s energy system transitions to 100 percent renewable electricity and net zero greenhouse gas emissions?

Utilities in Massachusetts offer LMI rates, which are publicly available.<sup>56</sup> Low-income households are also eligible for heating fuel assistance through the Low Income Home Energy Assistance Program (LIHEAP).<sup>57</sup> Though it is not publicly available, the gas and electric utilities record energy use and expenditures of every customer, including households participating in LMI programs. Importantly, not all LMI households participate in LMI programs—some households are simply unaware of them, while others are aware but choose not to participate.<sup>58</sup> The Massachusetts Department of Revenue has access to, but does not make publicly available, information on household income. Together, these two data sources could provide the information necessary to determine the approximate energy burden of every household in Massachusetts. Collecting data of this nature (e.g., tracking low-income households, their income, and their energy expenditures) would require combining existing data in one place or a new source of data, such as a survey or a new question on the U.S. Census Bureau American Community Survey<sup>59</sup> and would also entail serious privacy concerns, calling for strict data privacy protocols, such as multi-factor authentication, developing and maintaining incidence response plans, developing authorized user and access protocols and/or data encryption techniques.

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<sup>56</sup> Massachusetts Electric Power Division. No date. “Electric rates and tariffs”. Available at: <https://www.mass.gov/service-details/electric-rates-and-tariffs>.

<sup>57</sup> Massachusetts Housing and Community Development. No date. “Low Income Home Energy Assistance Program (LIHEAP)”. Available at: <https://www.mass.gov/service-details/learn-about-low-income-home-energy-assistance-program-liheap>.

<sup>58</sup> Illume Advising. February 27, 2020. *Residential Nonparticipant Market Characterization and Barriers Study*. Available at: <https://illumeadvising.com/files/Residential-Nonparticipant-Market-Characterization-and-Barriers-Study.pdf>.

<sup>59</sup> U.S. Census Bureau. No date. “American Community Survey (ACS)”. Available at: <https://www.census.gov/programs-surveys/acs>.



**6. The burdens of existing energy infrastructure must be reduced for nearby residents and workers. Additionally, ensure that increased clean energy investments do not increase the energy burden in LMI and EJ populations**

*The state should establish target deadlines to close polluting facilities, such as aging landfills, incinerators, fossil-fuel power plants, and other facilities that create a public health burden, especially for environmental justice populations and other historically marginalized communities. The State should also aim to reduce the energy infrastructure burden in EJ populations when siting new energy infrastructure. Utility rate design must incorporate analysis of environmental burdens. Utility rates must be monitored to ensure rates decrease or are stabilized for LMI communities during the transition.<sup>60</sup>*

**a) Recommended metric: Create an energy infrastructure database**

Track/classify existing energy infrastructure: Track and make publicly available a database that lists the location, age, type, emissions profile, permit exceedances, and violations of all existing energy infrastructure, including: energy storage facilities, compressor stations, pipelines, substations, transmission lines, landfills, power plants (including utility-scale solar and wind), and backup generators. Update the database at least once per year, and account for any and all infrastructure retirements or additions. Where there are existing databases that document emissions profiles or permit exceedances, we are not recommending recreating those databases. Instead, we recommend a website landing page that links to the relevant existing sources of information and includes a new database to cover information not currently retained elsewhere.

**b) Recommended metric: Determine which communities are burdened by existing energy infrastructure**

Identify and track overburdened communities: Use the energy infrastructure database to identify which communities are overburdened by energy infrastructure sited in their neighborhoods. We recommend utilizing a relative standard to identify overburdened communities, whereby communities with the greatest number of polluting, fossil fuel facilities are defined as overburdened as well as communities with the greatest number of facilities, polluting or not. (It may be necessary to create weights to better capture the burden of different kinds of energy infrastructure on communities, for example, to reflect size or the extent of pollution generated.) As an example of how such a relative standard would work, the energy infrastructure database (and any associated weights) could be used to determine the average energy infrastructure burden

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<sup>60</sup> GWSA IAC. September 28, 2020. *GWSA IAC CJWG Refined List of Preliminary Recommendations*. Available at: <https://www.mass.gov/doc/iac-climate-justice-work-group-policy-priorities/download>.



among all communities in the Commonwealth; any community with more energy infrastructure than the average would be classified as overburdened. This standard would change over time as the Commonwealth retires polluting facilities. The database should also identify which overburdened communities are EJ populations. In addition to making this database publicly available (including the list of overburdened communities, which of those are EJ populations, and information about the energy infrastructure that is sited in those communities), publications summarizing the state of energy infrastructure and overburdened communities that are suitable for a broad audience should be produced at least once per year.

**c) Recommended metric: Establish closure dates for all energy infrastructure**

Track energy infrastructure closures: Each facility in the energy infrastructure database should be assigned a closure date based on its useful lifetime. If the infrastructure in question is polluting, its closure date should be consistent with Commonwealth emission reduction goals, even if that closure would otherwise be prior to the end of its economic lifetime. Infrastructure in overburdened communities may merit early retirement depending on their impacts; infrastructure closure dates should take into account EJ community status, public health impacts, and other social and economic demographics. Update the database at least once per year, and account for any and all actual infrastructure retirements.

**d) Recommended metric: Energy burdens are reduced or are stabilized for low- and moderate-income (LMI) communities**

Yes/no metric: Have energy burdens (energy costs as a share of income) among LMI households remained stable or been reduced every year between now and 2050 (when the transition to 100 percent renewable electricity and net zero greenhouse gas emissions is complete)? (Note: This metric is identical to Metric #5b.) For example, two households may each pay \$6,000 per year in electric and heating costs but one household earns \$30,000 while the other earns \$120,000. The energy burden for the household with the lower income would be 20 percent ( $\$6,000/\$30,000$ ) while the energy burden for the household with the higher income would be 5 percent ( $\$6,000/\$120,000$ ). It is particularly important that the communities that are shouldering the burden of the physical energy infrastructure and have been categorized as energy overburdened (per Metric #6b above) should not be subject to additional energy cost burdens. Currently, electric rates in Massachusetts do not account for which communities are burdened by their infrastructure and which are not.

## Comments on the Clean Energy and Climate Plan for 2030





Massachusetts Clean Energy and Climate Plan for 2030 (2030 CECP) details the actions that the Commonwealth will take over the next decade to ensure that the state is on track to achieve its target of 45 percent emissions reductions by 2030 and net zero emissions by 2050. The 2030 CECP and the 2050 Decarbonization Roadmap (which examines various pathways for the Commonwealth to achieve net zero emissions by 2050) are being prepared in parallel so that the actions outlined in the 2030 CECP will align with the Commonwealth’s overall decarbonization strategy for 2050.<sup>61</sup>

On December 30, 2020, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) made the draft 2030 CECP available for public comment; these comments will inform the final plan. AEC reviewed the 2030 CECP equity content and found three important areas for improvement:

- equity and justice goals need to be measurable,
- these goals need to be actionable by the state, and
- community engagement standards need to be robust and transparent.

The 2030 CECP contains a “Commitment to Equity” as well as several equity and justice-specific goals throughout the report, including:

### Overarching equity aims

1. **Equitable implementation:** “equitable implementation of policies that impact residents and businesses in their jurisdictions”<sup>62</sup>;
2. **Health and economic equity:** “closing the health and economic disparities experienced in Environmental Justice communities and communities of color”<sup>63</sup>;
3. **Equity of benefit access:** “greater equity of access to mobility and the benefits of decarbonization”<sup>64</sup>; and
4. **Affordability standards:** Consider additional issues, including “Zero up-front capital solutions for low income and affordable housing residents.”<sup>65</sup>

### Transportation-specific equity aims

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<sup>61</sup> Massachusetts Executive Office of Energy and Environmental Affairs (EEA). December 30, 2020. “Clean Energy and Climate Plan for 2030”. Available at: <https://www.mass.gov/info-details/massachusetts-clean-energy-and-climate-plan-for-2030>.

<sup>62</sup> Ibid. p.9.

<sup>63</sup> Ibid. p.10.

<sup>64</sup> Ibid. p.18.

<sup>65</sup> Ibid. p.33.



5. **Electric vehicle access:** “seeking to develop a low and moderate income (LMI) consumer programs [sic] to help provide more equitable access to the benefits of ZEVs”<sup>66</sup>;
6. **EV chargers in EJ neighborhoods:** “additional support for charging equipment in Environmental Justice communities in Eversource territory”<sup>67</sup>; and
7. **Accelerating clean transportation:** “prioritizing positive environmental justice impacts” in the “Accelerating Clean Transportation Now (ACTNow) program by MassCEC.”<sup>68</sup>

#### Energy-specific equity aim

8. **Targeted incentives and outreach:** “DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in Environmental Justice communities through targeted community-based incentives and outreach programs, and increased funding for pre-weatherization barriers.”<sup>69</sup>

#### Community engagement equity aim

9. **Engagement, trust and transparency:** EEA is committed to “enhance dialogue, stakeholder trust, and governmental transparency.”<sup>70</sup>

#### Measurable goals

It is important that Massachusetts EEA set equity and justice goals that can be measured, and be clear about the data and metrics that will be used to measure progress towards those goals. For a goal to be measurable, it needs to have a clear definition of success and metrics that can be used to measure progress towards its success. Some of the 2030 CECP’s equity goals are easily measurable, because their success is relatively easy to define (goals #4, #5, #6, #8 and #9), and others are not, because their notion of success is vague or ill-defined (goals #1, #2, #3 and #7). It is important to note that even when the success of an equity or justice goal can be well-defined, that is no guarantee that the data or information needed to measure success exist.

For example, goal #6 (EV chargers in EJ neighborhoods) is easily measurable. Success could be measured by determining whether utilities dedicate additional funding to develop electric vehicle charging equipment in EJ populations, and whether electric vehicle charging equipment is actually sited in EJ populations.

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<sup>66</sup> Ibid. p.22.

<sup>67</sup> Ibid. p.23.

<sup>68</sup> Ibid. p.25.

<sup>69</sup> Ibid. p.31.

<sup>70</sup> Ibid. p.11.



On the other hand, goal #1 (equitable implementation) is not easily measurable. Defining success would require quantifying “equitable [policy] implementation,” identifying which residents and businesses are impacted by the policy in question, and collecting new data that are sufficient to monitor policy impacts for those residents and businesses.

### **Actionable goals**

It is equally important that equity and justice goals be actionable by the state. The 2030 CECP mentions two groups dedicated to providing equity and justice feedback and input. First, the EJ Task Force (which includes representatives from every EEA agency and office),<sup>71</sup> which will provide a “comprehensive assessment of the Secretariat’s programs and policies through an equity and justice lens.”<sup>72</sup> Second, the IAC-led Climate Justice Working Group (CJWG), which will advise EEA and provide recommendations regarding “the development of climate mitigation policies that can benefit EJ populations and other historically marginalized communities.”<sup>73</sup> These groups, however, do not have the authority to set policy, regularly monitor policy impacts, or take action when goals are not met.

For a goal to be actionable, it needs to have a clear implementation path that designates responsible parties for policy/program implementation, measurement, and follow-up. Some of the 2030 CECP’s equity goals are clearly actionable by the state; others entail an implementation path by or through state agencies that are either not obvious or not clearly described.

For example, goal #8 (targeted incentives and outreach) is clearly actionable. The goal specifies that the Massachusetts Department of Energy Resources (DOER) will work to achieve the goal of expanded access to energy efficiency and clean heating for LMI households, which means that DOER would have the authority to require electric distribution companies to offer targeted LMI energy efficiency incentives and outreach programs, though such incentives and programs require approval by the Department of Public Utilities.

On the other hand, goal #2 (health and economic equity) does not appear to be actionable by state agencies. It does not specify what action the Commonwealth could or would take to close health and economic disparities in EJ populations, or what measures to take if these disparities are not closed. It also does not specify which government bodies have the authority to force action to close these disparities if they fail to be addressed by the 2030 CECP.

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<sup>71</sup> Ibid. p.11.

<sup>72</sup> Ibid. p.11.

<sup>73</sup> Ibid. p.14.



## **Community engagement**

Finally, the 2030 CECP expresses the importance of public engagement “to avoid inequitable outcomes”<sup>74</sup> but falls short of specifying what kinds of community engagement standards or metrics will be used regarding goal #9 (engagement, trust, and transparency). To build public trust, it is important to be clear about how the public will be engaged and how public feedback will be considered. For example:

- How many public meetings and/or community workshops will be held?
- Will public input be sought at all stages of policy development and decision-making?
- Will partnerships with community-based organizations be developed?
- Will different kinds of policies/programs entail different levels of public engagement?
- Will community co-management of project development be offered, and under which circumstances?
- Will policy and program budget information be made publicly available?
- Will historically marginalized groups be provided active roles in decision-making?
- How will public feedback play a role in holding parties accountable in the case that equity and justice goals are not met?
- Will outreach and education be conducted in multiple languages?
- Will all public meetings be accessible to people with mobility needs and Americans with Disabilities Act accessible?

## **Conclusion**

For Massachusetts equity goals, including those specified by the CJWG and those contained in the 2030 CECP, to be more than just lip-service, it is of vital importance that they be formalized with concrete, specific plans that meaningfully engage the community and actionable metrics to facilitate their evaluation. In other words, all equity and justice goals need to be measurable, actionable, and involve robust, meaningful, and transparently conducted community engagement processes. This report demonstrates that much of the data and information needed to measure progress towards equity and justice goals do not currently exist or are not currently publicly available, and draws attention to the additional efforts that will be required to measure progress regarding the impacts of climate policy in EJ populations and other historically marginalized communities.

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<sup>74</sup> Ibid. p.11.



The recommendations contained in this report are intended to push the Commonwealth to the next level on issues of equity and justice by providing a starting point for discussions regarding what types of data collection, community involvement and public policy actions will be required to measure progress towards equity goals in the Commonwealth.

March 22, 2021

### **Nexamp Comments: Interim Clean Energy and Climate Plan for 2030**

Nexamp, Inc. appreciates the opportunity to provide comments on the Interim Clean Energy and Climate Plan for 2030 (2030 CECP).

Nexamp was founded in Massachusetts over a decade ago by two U.S. Army veterans. Since that time, we have evolved from a small residential solar installer to a vertically integrated clean energy company, developing solar and storage projects. We are proud to have built a national portfolio of over 100 clean energy projects totaling approximately 300 MW. Additionally, Nexamp has over 200 MW of storage in operation or in our pipeline and is operating in or developing projects in multiple states.

Massachusetts' solar programs have allowed us to bring our fair and flexible community shared solar platform to all Massachusetts residents – with guaranteed savings, no sign-up costs, no credit checks, and no long-term contracts. At Nexamp, we believe everyone – regardless of where they live– should be able to reap the benefits of solar.

Nexamp is a member of both the Coalition for a Community Solar Access (CCSA) and the Northeast Clean Energy Center (NECEC), and we support the comments submitted by both regarding the 2030 CECP. Our remarks below are intended as a supplement to the comments of these organizations.

We thank the Executive Office of Energy and Environmental Affairs (EEA) for charting a course to a lower carbon future and a true clean energy economy for the Commonwealth. Massachusetts has always been a leader in climate and clean energy action, beginning over a decade ago with the Global Warming Solutions Act (GWSA), which recognized the urgency of the challenge facing our state, country and global community. Now more than ever, bold action is needed to protect the Commonwealth from the most detrimental impacts of climate change over the coming decades. In finalizing the 2030 CECP, we urge the Administration to be bold in the face of the looming climate threat.

### **Solar Growth is Critical to Meeting 2030 and 2050 Goals**

#### *The State Needs Bold Solar Goals*

Nexamp appreciates the Administration's acknowledgement in the 2030 CECP of the pivotal role that distributed solar has played to date in Massachusetts' clean energy efforts. Indeed, for over a decade distributed solar has proven to be a reliable and cost-effective clean energy resource. Now more than ever the state needs to be setting aggressive solar goals, sending clear signals to the solar market that Massachusetts will continue to lead. The Plan as written, however, deems the 3,200 MW of SMART capacity and an additional 2 GW of solar by 2030 sufficient to meet the state's greenhouse gas emissions reduction goals. We urge the Administration to set more ambitious solar deployment goals in the 2030 CECP, to ensure that

state make significant gains in solar deployment in the next decade to put the state on-pace with clean energy deployment needed by the middle of the century.

### *Solar is Proven and Cost-Effective*

Echoing CCSA's comments, solar has been the backbone of the of the clean energy economy in the state for over a decade now, and while wind and other renewable resources are promising and important to realizing a diversified clean energy portfolio, we cannot lean too heavily on resources that have not seen proliferation to date. In stark contrast to the 106 MW<sup>1</sup> of utility-scale wind and 420 MW<sup>2</sup> of hydropower operating in Massachusetts, the state has seen 3,047 MW<sup>3</sup> of solar deployment to date. As CCSA notes, this number represents meaningful benefits for Massachusetts' residents, businesses and communities in the form of monthly electricity bill savings, tax revenue for local communities, jobs for Massachusetts workers, and investment made in towns and cities across the state. According to SEIA, there are 419 solar companies in the Commonwealth, including 71 manufacturers and 150 installers and developers. Total solar investment in the state to date has been approximately \$7,250.63 million."

The state prioritizes cost-effectiveness in establishing the means by which it will reach net zero emissions by 2050 and make progress toward that goal by 2030. "Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid," a December 2020 report, finds that, "deploying at least 247 GW of local rooftop and community solar on the grid would be the most cost-effective way to transition to a clean energy system by 2050. It is also the most cost-effective way to reach 95% emission reductions from 1990 levels<sup>4</sup>." Building on this, the report finds that expanded deployment of solar and storage has the potential to create over 2 million local jobs nation-wide and save \$473 billion nationally by 2050<sup>5</sup>. In other words, investing in distributed solar, as a means to achieving net zero emissions is not only sound policy, but the most cost-efficient way to meet state goals.

### *Solar Paired Storage Supports a Diversified Renewable Energy Portfolio*

We urge the state to keep in mind the critical role that storage will need to play in Massachusetts meeting its 2030 CECP and 2050 Roadmap targets. Not only does storage help smooth system demand, lowering electricity costs, but the "Local Solar for All" report finds that increasing distributed generation-scale solar "unlocks the full potential of utility-scale solar and

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<https://www.eia.gov/state/analysis.php?sid=MA#:~:text=In%202019%2C%20hydropower%20supplied%20the,includin%20two%20pumped%20storage%20facilities>

<sup>2</sup> Lists of Qualified Generation Units, <https://www.mass.gov/service-details/lists-of-qualified-generation-units>

<sup>3</sup> <https://www.seia.org/states-map>

<sup>4</sup> <https://www.localsolarforall.org/roadmap>

wind, and has the potential to spur 798 GW of utility-scale solar and 802 GW of utility scale wind by 2050 nationally<sup>6</sup>.

As CCSA notes, the December 2020 “Local Solar for All Roadmap” cited above finds that “under a national 95% clean electricity target, leveraging expanded local solar and storage can save the United States \$473B by 2050 compared to a clean electricity grid that doesn’t meaningfully invest in local solar and storage. Expanding local solar and storage on the distribution system reduces the need for power plants that only run on peak power days. It also better manages and reduces demand on the distribution system by offering more local energy products that customers want, which can increase grid resilience and reduce overall costs on the distribution and transmission grid<sup>7</sup>.”

The 2030 CECP underscores that “the Commonwealth has thrived while reducing emissions,” and we largely have solar to thank for this. EEA has acknowledged the critical role that solar has played in helping the state meet its climate and clean energy goals to date. It is not an accident, but the intended result of a clear, fair, predictable market for DG solar. The solar industry is capable of helping the state achieve its 2030 and 2050 goals, but needs the same firm, ambitious solar and storage goals in the 2030 CECP that helped make previous solar programs a success, as well. We urge EEA to act to ensure that these technologies can continue to contribute to the state’s climate and carbon goals over these next critical decades.

### **Interconnection Challenges & Opportunities**

Massachusetts currently faces interconnection challenges that pose a threat to the growth of all clean energy resources, and the state’s progress toward its 2030 CECP and 2050 Roadmap goals. These challenges, however, present an opportunity for the state to take a holistic and forward-thinking approach to grid updates to ensure a reliable, modernized grid allows distributed generation to thrive in the years to come.

We echo the specific recommendations made by CCSA with regards to interconnection. One such recommendation is integrated planning. In order to achieve deep decarbonization, the state needs to adopt and incentivize an integrated distribution (IDP) planning approach. Such an approach is marked by holistic and forward-thinking planning of grid modernization through collaborative partnerships between the Electric Distribution Companies (EDCs) and solar developers. By thoughtful planning for the grid not only of today, but of the future, the electric grid can support the proliferation of distributed generation now and into the future.

Ensuring that utilities adhere to interconnection tariff timelines is equally critical to ensuring the continued growth of DG in Massachusetts. Projects across the state currently face extensive interconnection delays, making the market increasingly unsavory for solar development at a time

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<sup>6</sup> “Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid: Results Summary” December 2020

<sup>7</sup> “Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid: Results Summary” December 2020



when clean energy growth is critical to meeting the state's emissions reductions goals. We urge the state to create enforceable timelines – and corresponding incentives and penalties – to ensure that projects are interconnected on time.

Lastly, we echo CCSA's call for fairer, more equitable allocation of interconnection costs. Currently in Massachusetts, the first project in the queue at a given substation must bear the entire cost of any required upgrade costs. This approach does not take into account the benefit that such upgrades provide not only to other clean energy projects interconnecting to a given substation, but to the electric grid more broadly. In approaching solutions to interconnection challenges – solutions needed if we are to meet our 2030 and 2050 goals – we urge the state to better accounting for all beneficiaries in determining a fairer cost allocation approach.

### **Balancing Conservation and Clean Energy Deployment**

A critical conversation to have when considering clean energy proliferation over the next decade, and through 2050, is land use. Nexamp appreciates that the 2030 CECP recognizes that significant amount of ground mounted solar will be needed in the coming years, and acknowledgement that “overly constraining the development of ground-mounted solar in Massachusetts would likely cause this demand to simply leak across the Commonwealth's borders.”

While Nexamp supports constructing solar farms on the built environment, brownfields, landfills and other previously disturbed lands, where possible, these sites alone cannot support the amount of solar needed to help the state meet its critical climate goals.

The built environment presents unique obstacles for solar project development and construction, including project size limitations, buildings and rooftops that meet the structural requirements necessary to support solar for twenty years or longer, as well as energy buyers that have the credit strength to satisfy lender requirements in the form of a PPA, or desire to host an array. The presence of any one of these factors make it impossible for a project owner to move forward with construction on a site.

Community solar both supports Massachusetts farmers and allows us to protect our farmland. For many farmers, leasing land for construction of a community solar farm can mean the difference between selling their farmland or being able to preserve what in many cases has been a way of life passed down through generations. Hosting a community solar farm provides a meaningful additional revenue stream for landowners, that can help a farmer continue farming. When farmland is sold, it is far more likely to subsequently be host to a fixed structure – like commercial buildings or housing – that have a much more permanent and detrimental impact on the land and local habitat and ecosystem.

Nexamp's community solar farms use diverse seed mixes and where possible employ solar grazing practices, thereby enhancing the solar farms' benefits to the local ecology and ensuring a healthy ecosystem remains beyond the service life of the project. When our solar farms have

reached the end of their service life, Nexamp is responsible for deconstructing and removing all equipment, much of which can be recycled.

As solar helps the Commonwealth make progress towards its clean energy and climate goals, it is curbing the devastating impact of climate change on the state's ecosystems and habitats. Conservationists and solar developers have a critical common ground in this regard. It is critical to the success of the 2030 CECP and 2050 Roadmap that Massachusetts be able to find the appropriate balance between protecting fragile ecosystems and habitats and determining which open spaces make sense for solar. To this end, solar developers, conservationists and others should have an open and collaborate dialogue and work together to determine how to find this balance.

### **Environmental Justice**

Nexamp applauds the Administration for affirming in the 2030 CECP its commitment to ensuring that the state's transition to a low-carbon economy helps reduce the health and economic disparities experienced by Environmental Justice (EJ) communities and Black and brown communities. The Plan references the work of the IAC-led Climate Justice Working Group (CJWG), and we appreciate that consideration of impacts on EJ and other historically marginalized communities were, according to the CECP, at the forefront of considerations made in crafting the Plan and suggested clean energy and climate policies. We echo CCSA and NECEC's recommendation that the CECP explicitly outline how these communities will have an active voice in shaping the clean energy and climate measures in the decade (and decades) to come, and how specifically funding to these communities will be allocated.

Additionally, as CCSA's comments underscore, we cannot have a conversation about environmental justice as it relates to energy production without acknowledging the fact that historically in Massachusetts and across the country, Black and brown communities have been disproportionately impacted both by dirty energy sources and the impacts of a changing climate. Historically, fossil fuel plants have been sited in poorer, urban areas, meaning that communities that often already face healthcare resource constraints are further burdened by air pollution and associated health impacts. Renewable energy deployment reduces this burden. In the vein of finding the appropriate balance between land conservation and clean energy deployment, Massachusetts must ensure that the growth of clean energy – and the coinciding retirement of fossil fuel generation that have disproportionately plagued environmental justice and low-income communities – is not hindered.

### **Conclusion**

The 2030 CECP represents Massachusetts commitment to a clean energy economy and protection against the most egregious impacts of a changing climate, for all Massachusetts people, our communities, and our natural ecosystems. As we work to together establish a plan to help us achieve significant emissions reductions and clean energy deployment by 2030 and



set the state up for successful achievement of its 2050 Roadmap goals, we urge the Administration to consider our recommendations above. Thank you, and please do not hesitate to contact us with any questions.

Sincerely,

Kelsey Fiori  
Sr. Policy Associate

The Northampton Area League of Women Voters submits these suggestions for creating a rigorous timeline and ideas for strengthening the policies outlined in the CECP.

### **Risk mitigation. Data collection.**

We need risk mitigation. There are no downsides to overshooting our emissions reduction targets. In contrast, failure to achieve our targets will have a significant negative impact on reaching future targets. The state's plan needs to be strengthened to ensure a successful outcome - it needs risk mitigation. Possibilities include: Aggressive timelines and clear benchmarks. In many cases, the plan lacks solid benchmarks with which to measure success within the next decade to make sure that we might indeed achieve our 2030 goals.

Certainly, the faster we can move forward, the lower the risk of failing to meet target emissions.

### **Develop methods to track progress toward policy goals**

- Purpose: Policy guidance, risk mitigation.

The state needs to implement data collection systems to be able to monitor the success of its policies regarding adoption of new technologies. Data collection might include: numbers of heat pump systems, system type, and BTU rating of such systems; sales of ICE and BEV, PHEV and Hybrid vehicles; RMV data, building permit energy information. The results of the data collection should be reported within 3 months of the end of each calendar year.

- Why? Initial policy development and corrective policy actions to address shortfalls regarding the effectiveness of current policies, require up-to-date knowledge of progress toward meeting those goals. In a situation in which we are trying, for example, to increase EV sales by 100,000 per year, the state needs up to date information on EV stock.

### **Develop a method to determine GHG emissions within the most recent calendar year**

- Purpose: Policy guidance, risk mitigation.

● Details: The state needs to implement data collection systems and reporting requirements to enable the determination of reasonably accurate sector-wide GHG emissions. These estimates should be reported to state lawmakers and the public with any clarifying measures of uncertainty within 3 months of the end of each calendar year. This could involve using state databases (fuel tax receipts) or new requirements for reporting specific types of activities (fuel sales by type, specific measures of energy use, energy mix, use of non-energy GHG chemicals, ISO-NE and municipal utilities data on electrical sales and fuel types, etc.).

- Why? Initial policy development and corrective policy actions to address shortfalls regarding the effectiveness of current policies, require up-to-date knowledge of GHG emissions in the state.

### **Transportation**

- Establish 2030 target of 1 million new EVs The Governor's 2050 Roadmap clearly says that we will need 1 million EVs on the road by 2030.
- Set 2021 as the deadline for adopting California standards and 2023 for MDHDV standards.
- Establish in 2021 100% ZEV targets for state and municipal fleets by 2035
- In 2021, define initial rebate levels to achieve the goal of having a stock of 1 million EVs on the road in 2030. Identify and secure funding sources as early as possible.

- Establish a group purchasing program to lower costs for state/municipal ZEV procurements by the end of 2021.
- With ISO-NE, establish market conditions to support Vehicle-to-Grid support for the grid.
- Require utilities to establish and promote alternative rate structures that enable ZEV owners to charge their vehicles at times that are beneficial to grid systems (e.g., off-peak or periods of high renewable power generation). This will help align power consumption with periods of peak power generation. Programs such as this have been successful in California for when solar power generation is highest.
- Design, implement and fund Low- and Moderate-Income EV incentive programs starting in 2021.
- In 2021, establish targets for the number of charging stations available to the public.
- Provide incentives for EVSE at multi-family properties, starting in 2022.
- Deploy a large number of fast-charging stations on MassPike and Interstate rest areas.
- Invest in the grid infrastructure to support EV charging. Ensure that the charging networks have access to the power required to provide charging service. Transportation hubs will need significant upgrades to provide enough power for large numbers of charging EVs. Houses, rest stops, and commercial parking lots are also not designed to provide the energy needed to replace the fuel at a gas station. *Boston Consulting Group found that the representative utility, depending on charging patterns, will need to invest between \$1,700 and \$5,800 in grid upgrades per electric vehicle (EV) through 2030. The Union of Concerned Scientists estimates that electrifying LDVs will increase power consumption 42%.*
- Improve mass transit by expanding existing MBTA, Commuter Rail, and regional transportation services.
- Develop microtransit pilot projects to extend public transportation options beyond the "end of the bus line", particularly in rural areas.

## **Buildings**

The stretch energy conservation code should become mandatory and effective statewide by January 1, 2024.

- We need to introduce a mandatory high-performance energy code (not a 'stretch' energy code, but the basic energy conservation code) in enough time to be sure that new buildings do not lock in antiquated HVAC systems that burn fossil fuels and that will require retrofitting before the end of their useful life. We are in a crisis situation. Buildings last a long time so buildings built now need to be, as much as possible, 2050 compliant.
- Expand the energy conservation code definition of 'substantial renovations' to include a wider range of renovations. To broaden the jurisdiction of the code so that more renovation projects will trigger full compliance. We need to expand the code to more of the existing building stock. This will result in lower building emissions

## **Commission and Task Force on Clean Heat by May 2021.**

- **Establish the mandate for the Commission and Task Force. Make it permanent. Include implementation in that mandate.**

The CECP has addressed the need for an emissions cap by forming a commission and task force. It is essential to make that body permanent and give it a clear mandate with formal

goals, deadlines and metrics, and a share of the responsibility for implementation. Creating a committee to address a politically charged and highly challenging assignment like this is akin to kicking the can down the road. Making the mandate of that committee formal and clear and detailed, making it permanent and giving it implementation responsibility, will increase the likelihood of success. Making the Commission and Task force permanent, creating a plan with formal goals, metrics and deadlines and details, ensuring that its work is lasting, effective, budgeted and staffed, giving it the power to promulgate regulations, and creating structural links to the Governor's office and the EEA will make certain that it is more than just a volunteer group that prepares a report for the file.

*Some other questions that need to be addressed are:*

- Will there be incentives in addition to fees and penalties? Would MassSave be the vehicle for distributing these incentives? How many taxpayer dollars will need to be budgeted?
- How will the Commonwealth influence private decision-making on system replacement near system turnover points? Is there a mechanism for planning and implementing replacement of fossil-fuel burning systems before they fail in emergency situations?
- What will fund the capital solutions for low income and affordable housing residents? In particular, how will such solutions encourage or force private owners of multifamily housing to reduce GHG emissions, and protect low-income tenants from rent increases?
- What will be the mechanisms for implementing energy benchmarking of 5.9 billion square feet of building stock? Will there, for instance, be a requirement for owners to submit multi-year emissions-reductions master plans?
- What will be the mechanisms for financing building decarbonization? Will there, for instance, be a state-capitalized 'green bank'?
- How can the market for ground-source and air-source heat pumps and air-source hot water heating be broadly and rapidly expanded? *How can the workforce in these trades be expanded, and in particular, how can members of EJ communities be introduced in large numbers into this workforce?*
- **How can resistance in the real estate industry to benchmarking, labeling and rental standards be overcome?**

### **Develop and Coordinate Regional Planning and Markets**

- The draft CECP includes no deadline for implementing changes in ISO-NE operations. The state should establish an aggressive deadline for engagement with other states and ISO-NE to complete new market rules, system planning processes, and transparent governance. The earlier these are in place the more profitable and affordable clean energy and energy transition technologies will be. Markets need to support DER, vehicle-to-grid storage, expanded DSM capabilities and grid-scale energy storage through new clean energy forward capacity, spot, hour-ahead and ancillary markets. Coordination with the other NE states should be initiated immediately to both reap the benefits of that cooperation and provide the experience with any aspects that may need improvement over time.
- Exclude wood waste, wood pellets, and wood specifically harvested for electrical generation from participation in attribute markets.

Preserve our sequestration resource while limiting GHG emissions. We need to conserve our forests for carbon sequestration. Wood emits more GHG than natural gas. Wood emits

particulates that exacerbate asthma and other pulmonary illnesses. Over a century or so our forests may re-sequester the carbon released upon burning, but, in the short term, they aggravate global warming with consequences that will take centuries to correct: more sea level rise, temperature rise, forest fires and species extinctions. *Finally, the sequestration potential of our forests is critical to achieving our 2050 net-zero target. Future sequestration should be a priority.*

### **Continue to Deploy Solar in Massachusetts**

Set a deadline of end of 2023 for concrete plans for piloting DER resources and innovative grid flexibility technologies, including a plan for state funding/incentives, if necessary

- Purpose: Set concrete targets and goals to make this happen and save the state and consumers money in the long-term
- Why? The earlier these initiatives are completed, the earlier the development of cost-effective new DER resources can begin, the earlier the business environment for new technologies will be clear, and the cheaper and more successful the integration of DER resources will be.
  - Incentivize the installation of roof-top solar and parking lot solar to ensure maximum build-out.
  - Determine funding sources.

Purpose: ease pressure on land-use issues related to ground-mounted solar

Why? Roof-top solar and parking lot solar do not use precious undeveloped land which is needed for sequestration. It also provides the greatest opportunity to ease the need for distribution system upgrades, given that it provides distributed generation.

- Set a deadline of the end of 2022 for ground-mount siting policy development.

Purpose: To ensure the most rapid and cost-effective deployment of appropriately-sited ground-mount solar

Why? The earlier these policies are completed, the earlier the appropriate development of ground-mounted solar can begin. Policy considerations should include minimizing ground-mounted solar on land in forests and near cropland. Solar panels are black and absorb heat. Solar installations have been shown to increase ground-level temperatures. We should avoid adversely increasing ground-level temperatures in forested and other green areas.

- Immediately initiate programs to support solar-industry-related job training programs in environmental justice communities. Determine funding sources.

Purpose: To ensure that solar job opportunities are equitably distributed. Initiate job training opportunities for EJ populations immediately, including consideration of issues related to transportation to training/job sites.

Why? If the state delays addressing training opportunities in EJ communities, jobs will be filled by others. To effectively ensure equitable opportunities and job placement, efforts to train workers in EJ communities and to address barriers to hiring must be an immediate priority.

- Programs to incentivize adoption of roof-top and parking-lot solar in EJ communities must be started immediately. Determine funding sources.

Purpose: To ensure equitable opportunities to benefit from solar power and rapid solar adoption

Why? A number of challenges need to be overcome to increase adoption of roof-top and parking-lot solar in EJ communities. These include, lack of wealth with which to purchase a solar system, lack of opportunities for community and co-op solar projects, multi-unit buildings, allocation of costs/benefits between property owners and renters, etc. Addressing these

challenges needs to start immediately to ensure that adoption of roof-top and parking-lot solar at the same pace in EJ and low- and moderate-income communities as in wealthier communities and those with more owner-occupied single-family dwellings.

### **Mitigating Other Sources of Emissions**

HFCs (Hydrofluorocarbons): Harmonize policy options, for greatest effect, by the end of 2021  
Purpose: Clarify deadlines and applicable policies to reduce HFC.

- By the end of 2021, the administration shall implement stringent requirements for HFC use. The administration should evaluate the requirements of the Kigali agreement as well as those of the RMP (Massachusetts' Refrigerant Management Program), SNAP (the EPA's Significant New Alternatives Program), and CARB's SLCP (California Air Resources Board, Shortlived Climate Pollutants Policy). These policies compliment and overlap each other. Concerning overlaps, whichever rule is more stringent for each end-use sector shall be adopted by Massachusetts.

- HFC: In 2021, MA must begin the regulatory process to update HFC regulations (MA Regulation 310 CHFC: Training in best practices and technology implementation.

Purpose: Ensure equity in training programs.

Why? The CECP proposes starting in 2021 to train the growing heat-pump installation workforce in best practices for mitigating HFC emissions from the existing stock, as well as train them to work with zero and low-GWP alternative refrigerants. Given that HFC emissions affect all areas of Massachusetts, training resources will be deployed statewide, especially aimed at bringing new technicians into the field across the Commonwealth. Concerted efforts will be made to involve EJ Communities and members of those communities in the development of those employment-ready skills. In this way, Massachusetts will have the workforce on track to handle new and existing products as the heat pump installation market ramps up in the next decade. MR 7.76) to include heat pumps and other new technologies.

- Methane emission related to natural gas distribution network: Develop and implement a pipeline gas phase out plan by 2022 targeting elimination of the use of natural gas by 2050.

### **Complete Agricultural Best Practices Plan by 2023**

Ensure early promulgation of agricultural best practices to both reduce emissions, particularly of N<sub>2</sub>O (Nitrous Oxide) and NH<sub>4</sub>, and optimize sequestration.

Best practices to improve soils through the Healthy Soils Action Plan (HSAP) should be reviewed for any improvements and an optimal implementation strategy and timeline. Results of this review will be completed by January 2023.

Why? Emissions due to agricultural GHG emissions have been decreasing primarily due to loss of farmlands. That said, meeting GWSA 2050 targets relies on both decreased emissions and increased sequestration. Farming practices provide both of these opportunities. In order to implement such plans incentives must be developed simultaneously to educate farmers and provide incentives of adoption of best practices. All of these should be expedited through use of satellite technologies to evaluate soil emissions and moisture conditions.

### **Protect Natural and Working Lands**

Proposed policy changes/additions:



- Strengthen forest and wetlands protection and restoration.

Purpose: These proposals add detail to strategies listed. They also include recommendations for priorities, monitoring programs, data collection, and resources for private landowners.

- Investigations for new incentives should include both review and consideration of voluntary landowner programs, conservation easements, tax incentives, land use policies, model zoning by-laws, and other tools.

- EEA should conduct a review of current monitoring and inventory programs and determine where additional monitoring is necessary. For example, it will be important to track conversion of forest and farmland to developed land, track quality of forest and farmland (which will help set priorities for protection and restoration) and monitor and track lands enrolled in voluntary incentive programs. New handheld and satellite technologies could be offered to enlist private forest landowners in monitoring.

- In addition to monitoring and reporting, voluntary incentive programs that provide benefits to landowners should have enforcement provisions.

Specifics for Forest Protection

- Forests should be maintained in their interconnected state as much as possible, maintaining connectivity both within Massachusetts and across state lines.

- Incentives for private landowners should encourage leaving trees to grow as long as possible to enhance carbon sequestration. In addition, with incentive programs for private forest lands, the state could target maintaining areas that encompass the oldest and most complex forests, ensuring protection of soil carbon too.

- EEA should review and revise policies that allow clearcutting on state lands.

- After reviewing existing policies and developing new policies, EEA should prepare a “toolbox” of protection and management strategies for private forest landowners. Tools identified should also include sources of education, training, and assistance.

- EEA should set target emissions and sequestration for forest and forest soils for 2030.

Specifics for Farm and Soil Protection.

- Incentives should be used to target the best farmlands from permanent conversion to other uses.

- The MA Dept of Agricultural Resources should estimate the need for more local food in the next decades, anticipating trends in pandemics, rise of in-state migration and population increase and associated food insecurity. The conclusions should help determine farmland protection needs.

Specifics for Wetland Protection

- EEA should lead a team of stakeholders to identify priorities for wetland protection and restoration, keeping in mind their important values for protection against climate change impacts (including resiliency).

Why? The existing strategies lacked detail (to be added when the Resilient Lands Initiative and the Healthy Soils Action Plan are completed) and the public needs to understand what actions will be pursued to increase carbon storage in forests, wetlands, and soils.

### **Incentivize Regional Manufacture and Use of Durable Wood Products**

EEA will continue exploring opportunities to incentivize the regional use of harvested wood in long-lived products, such as cross laminated timber and wood-based building insulation.

**Proposed policy changes/additions:**

- Evaluate climate-related values of various wood products.

Purpose: To weigh forest loss with need to produce forest products and evaluate the relative GHG emissions.

- Selection of products should have duration of carbon storage as a priority.
- Consideration should also be given to products that may in turn reduce toxins and emissions present in alternative uses (e.g., cellulose is safe and can be used as insulation in attics and walls).
- Third party certification standards must ensure that wood building materials are produced in a sustainable way. Wood products have sequestration potential, with different time periods to full decomposition. Additionally, some species last longer in products than others. Full carbon gains and losses are rarely counted. Minimizing forest loss should consider both factors.

### **Provide Communities with Better Tools to Guide Smart Growth**

Communities need better tools to reduce conversion of forest and farmland, to increase carbon sequestration and resiliency on a site-by-site basis, and implement smart growth.

- Develop model zoning ordinances on how to site energy projects (solar and wind farms, energy storage, power lines, etc.)
- Develop model zoning ordinances to allow housing in-fill, smaller houses (1000 square feet or less), no development in floodplains, and smaller lot sizes to facilitate adding housing stock within communities.
- Develop improved guidance to towns for site planning review (such as using soil with adequate organic content, retaining/adding native trees and native plants, maintaining streams/wetlands and buffers, controlling runoff and reducing impervious surfaces).
- Develop tools to assist towns in creating more walkable/bikeable communities.
- Develop incentives for towns to adopt model zoning ordinances, enact smart growth policies and expand/improve walking and biking access.

Why? Forests and farmlands currently serve as carbon sinks which store and sequester carbon and MA needs to retain as much carbon as possible. Towns need better ways to evaluate and plan for development including model zoning policies and smart growth policies which will avoid increasing impervious surfaces, increasing carbon sequestration and increasing resilience to flooding (brought about by climate change). Towns need better ways to evaluate and plan for cluster development near town centers thus reducing vehicle miles traveled, reducing need for additional infrastructure (roads, sewer systems, water systems, etc.), and minimizing loss of farmland and forests.

### **New Public Accountability Policies**

The transition that the administration is designing will result in many changes in the lives of our residents. The state needs to make its residents, businesses, local officials and legislators into partners in this transition in order for it to be successful. This must include providing information to as well as soliciting input from all constituents. It must also include nimbly addressing issues that arise that affect the lives of our citizens.

- Provide robust education to legislators and the public

The transition we are approaching will be more rapid and affect more aspects of our lives than previous changes we have experienced. The state will need to educate consumers, legislators and businesses to get everyone on board.

Purpose: Ensure that the public understands what the state is aiming to achieve and how the

transition will affect them.

Policy details – The state administration needs to have on-going programs to educate legislators, local

officials, businesses and the public about the overall goals of the transition to a green economy, the rationale behind the steps being taken, the specific steps to be taken along the way, how they will affect them, and what the administration is doing to include everyone in a successful transition.

- Web Portal - This should include a web portal documenting policies being advanced to meet GWSA emissions and technology adoption targets and all progress related to achieving technical and policy goals, etc.
- Full public outreach. - Most importantly, the administration needs to actively engage individuals, town officials, and legislators through public meetings, news media, etc. in the places they live and work. These policies will affect all residents and each needs to be reached in a variety of ways. Communication needs to include information on specific actions required by each resident. For example, residents need to each be informed by letter and by electronic communications about upcoming opportunities/changes that might affect consumers such as what to do when your furnace is approaching the end of its life. What options are or are not available if your furnace fails.
- Education/outreach - The administration will need to convince the public that climate emissions must be reduced within a decade. Systems of conflict resolution that include climate expertise need to be developed to work at many levels. The administration will need to anticipate and address any fossil fuel disinformation campaigns.

Why? – Ensuring public support and political will over thirty years will require a significant effort to keep everyone informed about what will be and is happening and how their concerns are being taken into account as we move forward.

### **Build public accountability into each policy decision**

- To ensure robust public participation in this joint effort the government must build public accountability and feedback from the public into all of its actions related to this energy transition.

Why? – A robust system to seek and address public comments and concerns about policies will be critical to implementing a successful energy transition and encouraging the political will to continue forward on this path. Input on policies should be solicited as policies are being shaped and on the outcomes of those policies with respect to intended and unintended consequences.

### **Initiate a transition Workforce Task Force in 2021**

Purpose: address workforce and education needs arising from the energy transition

The workforce task force will address employment needs, skills development and training, displaced worker retraining, situations in which retraining options are lacking, public school education curricula, community college and 4-year college courses to support the transition to a clean economy. The task force will assess needs, evaluate solutions and propose policies and legislation to address the workforce and training issues that need addressing in this transition. The task force will also need to focus on ensuring that the retraining and educational opportunities available are shared equitably across the state, including by environmental justice communities and low- and middle-income communities. Close consultation with unions, training

programs, colleges, technology companies, equipment installers, affected businesses, local leaders and leaders of environmental justice communities will be necessary.

- Why? – The upcoming energy transition will initiate significant changes in the number and kinds of

available jobs, training and educational requirements, the location of jobs, transportation to job sites, etc. The administration must proactively assess, plan for and address these needs to keep the energy transition on course. One model for approaching retraining in the wind industry can be found at: [https://nabtu.org/press\\_releases/nabtu-orsted-sign-landmark-mou/](https://nabtu.org/press_releases/nabtu-orsted-sign-landmark-mou/). The administration must also assess the needs of workers who are displaced in industries that are disappearing due to these transitions. Without a successful effort to bring all workers in MA into the new economy with livable wages through this transition, we will have failed in our moral responsibilities and risk public opposition to facing the challenges that we need to face.

### **Engage Higher Education**

Purpose: Tap potential of community colleges, 4-year colleges, universities and students to ensure success.

- Policy details – Educational institutions need support for research related to carbon sequestration, gridscale energy storage development, materials mineralization, enhanced food security and nutritional value, and much more.

Why? – We need to tap the research potential of higher education in the state to support research into future technology and policy options. We also need to provide a strong foundation for the education of students for the green-economy. We will need new graduates with diverse skills and backgrounds that will keep the energy transition going. As part of their education, students could learn by being involved in the transition they are experiencing by participating in GHG monitoring programs, public education programs, etc.

#### MEMBER INSTITUTIONS

Beth Israel Deaconess  
Medical Center  
Boston Children's Hospital  
Brigham and Women's  
Hospital  
Dana-Farber Cancer Institute  
Emmanuel College  
Harvard University  
Harvard Medical School  
Harvard School of  
Dental Medicine  
Harvard T.H. Chan School  
of Public Health  
Isabella Stewart Gardner  
Museum  
Joslin Diabetes Center  
Judge Baker Children's Center  
Massachusetts College of Art  
and Design  
Massachusetts College of  
Pharmacy and Health  
Sciences University  
Massachusetts Department  
of Mental Health  
Simmons University  
Temple Israel  
Wentworth Institute of  
Technology  
The Winsor School

#### ASSOCIATE MEMBERS

Boston University Wheelock  
College of Education & Human  
Development  
Fenway Community  
Health Center  
Massachusetts Eye and Ear  
Infirmary  
Merck Research Laboratories

The Massachusetts Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

March 22, 2021

#### Re: Initial Comments on the Massachusetts Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides,

I am writing to provide comment on the Massachusetts Clean Energy and Climate Plan for 2030 (CECP), issued by the Executive Office of Energy and Environmental Affairs (EEA) on December 30, 2020, on behalf of MASCO and its members.

MASCO is the preeminent organization planning, advocating, and providing transportation services for people to get to and around the Longwood Medical and Academic Area (LMA) safely and efficiently. MASCO's membership includes 22 prominent institutions, including three Harvard-affiliated teaching hospitals, three Harvard graduate schools, and six colleges and universities. More than 120,000 people, including employees, patients, students, and visitors, move in and out of the LMA every day—more than the entire population of the City of Cambridge.

The institutions in the LMA provide world-class healthcare, education, and cultural facilities while at the same time developing responsibly:

- The LMA contains thirty (30) LEED certifiable or certified buildings.
- 40% are certified as Gold.
- Two additional LEED buildings are under construction and pending LEED rating as of March 2021.
- Seventy 'Cool Roofs' help reduce the heat island effect in the LMA. Of these, there are 11 green roofs and approximately 59 high albedo (white) roofs.
- MASCO convenes sustainability leadership meetings to advance best practices and help spearhead new initiatives aimed at improving efficiencies, reducing demand for energy, and reducing our carbon emissions.

MASCO has actively participated in the Global Warming Solutions Act (GWSA) Implementation Advisory Committee meetings and we support the Administration's commitment to a people-centered approach to reducing GHG emissions and closing the health and economic disparities experienced in Environmental Justice (EJ) Communities. Our members heavily invest in many EJ Communities and are very supportive of this emphasis in the specific "strategy actions" identified in the Plan.

Specific comments are provided below.

**1. Hospitals, district energy plants and educational institutions have unique energy needs driven by city and statewide populations.**

The LMA's energy needs are driven by the people we serve across the Commonwealth. More than 2.8 million patients seek care in the LMA every year including more than 92,000 inpatients and 2.7 million outpatients. Over 27,000 students attend school, including over half of the City of Boston's four-year small college enrollment. To cater to these populations, our members must operate emergency rooms, operating rooms, patient care spaces, research labs, and specialized teaching classrooms, each of which contain the latest equipment and technologies that can require higher rates of energy usage. In a healthcare setting especially, the need for a reliable and redundant energy supply is essential for the life-saving care that is provided. Opportunities to temporarily decommission and retrofit existing equipment is limited. Hospitals in an urban setting are also very space-constrained, and higher-density with many stories. This makes adding meaningful renewable sources of energy impractical, limiting potential emissions reductions at the buildings level. In addition, post-pandemic new ASHRAE and CDC guidelines will place even greater demands on energy systems in a healthcare setting by requiring increased air changes, air filtration, and extended hours of operation in research and office settings, among other new standards.

**Recommendation:** We agree that there needs to be flexibility in 'timing and the need for technical solutions for buildings that are more complex, like hospitals.' To that end, we request that the State consider:

- Including a healthcare and/or biomedical representative on the Commission or Task Force for Clean Heat. In support of this, a technical advisory committee or official advisory board with industry-specific knowledge, like that in other cities such as NYC, may be warranted to ensure that strategies reflect the unique challenges facing modern-day healthcare facilities and district systems. In the case of the LMA, with a dedicated high efficiency, tri-gen power plant, the path to carbon neutrality is extraordinarily complex, and may require a unique pathway.

**2. To best match strategies to the unique energy needs of healthcare and education, close coordination is needed between State and City.**

Our members have been working with the City of Boston's Technical Advisory Group (TAG) related to their draft Building Emissions Performance Standards. We echo the comments of others representing healthcare and medical district needs who have recommended that it will be important to more clearly define building types and land uses and a corresponding set of achievable emission reduction requirements. In the case of the healthcare and educational institutions, this would address the unique 24/7 needs of providing patient services, and the latest teaching tools and technology.

**Recommendation:** We encourage the state to coordinate closely with the City of Boston and other municipalities when drafting new standards. We also encourage the state to use a similar approach, based on building type or use.

### **3. Non-profits, including hospitals, small colleges, and cultural institutions need financial tools to implement strategies.**

Before the pandemic, smaller educational institutions were already experiencing financial hardship and have suffered further after a year of online learning and loss of demand for on-campus services. Hospitals and research institutions have also eliminated elective procedures for periods of time to ensure the State had the beds available to treat COVID patients through several spikes in positivity rates over the past year. These factors, plus the significant costs of new technologies needed to meet emissions goals pose a big challenge to the non-profit community.

**Recommendation:** Given the significant investments needed in new technologies to meet the State’s energy and emissions goals, we ask the state to further consider developing a large-scale statewide financing program or “climate bank” for building sector decarbonization, and deep energy retrofits. For example, there will need to be research and development of alternative technologies for specialized energy needs, such as replacing hydrofluorocarbons. With large amounts of refrigeration at hospitals, laboratories, and universities, it would be helpful if the state could consider funding of research and development of alternative technologies.

### **4. A broader, more universal set of transportation-sector strategies are critical to realizing targets.**

We support many of the strategies described in Chapter 2: Transforming our Transportation Systems. This includes emissions targets for light-duty, medium and heavy-duty vehicles, and stabilization of VMTs. We also applaud the State’s leadership on the Transportation Climate Initiative Program (TCI-P) and subsidies to help make the EV market more competitive. However, there is opportunity to greatly expand upon the transportation strategies which narrowly focus on subsidizing zero emissions vehicles. Since the transportation sector is the most significant contributor to GHG emissions it will be necessary to develop a broad range of strategies addressing improvements to transit, funding transit management associations (TMAs) and exploring options for congestion pricing.

**Recommendations:** The Plan should greatly expand the transportation strategies contained in the Plan to include funding for more affordable, convenient, electrified, accessible transportation services. This includes incorporating the Administration’s Commission on the Future of Transportation report (2018) which contains the recommendation to prioritize investment in public transit. Public transit produces dramatically less GHG emissions per mile than single occupancy vehicles (SOVs). The LMA relies heavily on public transit to help reduce congestion and conserve limited road capacity for those who have no other choice than to travel by car, such as patients requiring life-saving critical care. Investment in public transit is essential not only to reduce GHG emissions and stabilize VMTs, but also to support the continued growth of the LMA, one of the Commonwealth’s critical economic engines.

Revenues from a cap and invest program recommended by the Commission should be invested in improved transit, walking and biking infrastructure, the State’s transportation management

associations (TMAs)<sup>i</sup> and transportation demand management (TDM) programs. MASCO itself runs a TMA, CommuteWorks, that has worked with our members for decades to reduce drive-alone rates, VMTs, congestion and GHG emissions. We are proud that our efforts have taken hold, with 48% of employees traveling to the LMA via public transportation, while 10% of employees walk, 4% ride a bike, and 4% carpool. Congestion Mitigation Air Quality (CMAQ) funding for TMAs was eliminated a few years ago, leaving a big gap for non-profit organizations to fill.

Thank you for the opportunity to provide input on such an important matter for the future of the Commonwealth. MASCO hopes to continue to serve as a resource to the State and I am happy to answer any questions about our recommendations. Please do not hesitate to contact me at (617) 632-2776.

Sincerely,

A handwritten signature in black ink that reads "Tom Yardley". The signature is written in a cursive, flowing style.

Tom Yardley  
Vice President, Area Planning and Development  
MASCO, Inc.  
tyardley@masco.harvard.edu  
(617) 632-2776



March 22, 2021

**ELECTRONIC SUBMISSION**

Kathleen A. Theoharides, Secretary  
Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Re: **Joint Comments of the Massachusetts Energy Efficiency Program  
Administrators on the Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides:

On December 30, 2020, the Commonwealth's Executive Office of Energy and Environmental Affairs ("EEA") released an interim Clean Energy and Climate Plan ("CECP") for 2030, requesting comments from the public by February 22, 2021, and later extending the deadline for public comment to March 22, 2021. The 2030 CECP outlines EEA's proposed strategies and policies for the Commonwealth to pursue over the next ten years to meet the greenhouse gas ("GHG") emissions reductions goal of 45% below the 1990 baseline level by 2030. The 2030 CECP is based on analysis contained in the 2050 Roadmap, also produced by EEA. The 2050 Roadmap provides for multiple technical and policy pathways to achieve net zero GHG emissions by 2050.

The 2030 CECP relies upon energy efficiency, and more specifically, the Massachusetts energy efficiency Program Administrators'<sup>1</sup> Mass Save® program, to play a key role in achieving the Commonwealth's emissions reduction goals, including goals related to reducing emissions from the building sector. The Massachusetts Program Administrators support the Commonwealth's goal of net zero GHG emissions by 2050, and have been the single most effective contributor to achievement of these goals to-date. Significantly, the Program Administrators have produced more GHG reductions than any other entity in the Commonwealth, with GHG reductions from energy efficiency totaling at least 5.6MMTCO<sub>2e</sub> as of the first quarter of 2020. The Program Administrators have the expertise, relationships, and delivery infrastructure to build on these achievements and deliver long-term energy savings and greenhouse gas emissions reductions, coupled with an emphasis on equity and management of near term and long-term customer energy burdens. The Program Administrators stand ready to build on their strong track record of transformational investments—such as driving the transformation of the lighting market to LED technologies—and on their history of successfully addressing market barriers, to embrace

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<sup>1</sup> The Berkshire Gas Company, Fitchburg Gas & Electric Light Company d/b/a Unitil, Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty, Massachusetts Electric Company, Nantucket Electric Company, Boston Gas Company and former Colonial Gas Company, each d/b/a National Grid, and NSTAR Electric Company, NSTAR Gas Company and Eversource Gas Company of Massachusetts, each d/b/a Eversource Energy (collectively, "Program Administrators" or "PAs"). Due to Governing Board review requirements, the Cape Light Compact JPE is unable to join in these Program Administrator comments at this time, and therefore is not included in the definition of "Program Administrators" for the purposes of this document.

the challenge of achieving climate and equity goals through energy efficiency. The Program Administrators are uniquely well-positioned to leverage their existing infrastructure to help the Commonwealth meet its GHG reduction goals.

For more than a decade since the passage of the Green Communities Act, and for 25 years prior to that, the Program Administrators have developed and implemented energy efficiency plans across the Commonwealth. Drawing upon their deep institutional knowledge of energy efficiency, the Program Administrators offer tactical feedback in these consensus comments in response to several of the Strategy Actions outlined in the 2030 CECP for transforming the building sector. Specifically, the Program Administrators: (1) offer some preliminary data and context in connection with the CECP's strategy to increase building electrification through heat pump incentives; (2) recommend the CECP include a strategy to pursue additional external funding for greater and faster heat pump adoption in the Commonwealth; (3) recommend greater consideration of customer bill impacts associated with the energy efficiency programs in the CECP strategies for the building sector; (4) request that the CECP qualify its strategies on natural gas and delivered fuels heating incentives to include a statement that any strategy going forward will be dependent upon, and consistent with, the findings and directives of the Department of Public Utilities' (the "Department") ongoing investigation in D.P.U. 20-80; and (5) offer their assistance in other areas using the established energy efficiency infrastructure that they have developed and fostered. Accordingly, the Program Administrators hereby submit these joint comments to the CECP for EEA's consideration.

## **A. Background**

The energy efficiency programs in Massachusetts are administered pursuant to the Green Communities Act, G.L. c. 25, §§ 19, 21, 22 (as amended, the "GCA").<sup>2</sup> The GCA requires the Program Administrators to prepare, every three years, an energy efficiency investment plan that provides for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply. G.L. c. 25, §§ 21(b)(1)-(3). Under the GCA, the Program Administrators pursue cost-effective energy efficiency measures, including, but not limited to, weatherization, heating systems, lighting, thermostats, and active demand reduction programs. The Program Administrators also began to pursue strategic electrification, where cost-effective, under the current 2019-2021 Three-Year Plan, following amendments to the GCA in 2018.<sup>3</sup> These energy efficiency measures provide benefits to customers in the Commonwealth in the form of reduced energy costs and reduced GHG emissions, as well as other energy system benefits, such as avoided transmission costs, avoided distribution costs, and low-income benefits. G.L. c. 25, § 21(b)(2); D.P.U. 08-50, at 5 (2008). The Program Administrators' programs also support a robust contactor infrastructure, support businesses and industry in the Commonwealth,

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<sup>2</sup> The Green Communities Act has been amended by the Energy Act of 2012, St. 2012, c. 209, and the Energy Act of 2018, St. 2018, c. 227.

<sup>3</sup> Where the Program Administrators reference strategic electrification, it is in the context of the GCA, which describes "strategic electrification" to include "measures that are designed to result in cost-effective reductions in greenhouse gas emissions through the use of expanded electricity consumption while minimizing ratepayer costs." G.L. c. 25, § 21(b)(2)(iv)(A).

and have a unique focus on serving low-income customers through a partnership with the low-income weatherization and fuel assistance program network.

The Program Administrators work closely with the Energy Efficiency Advisory Council (“EEAC”) to ensure energy, capacity, climate, and environmental goals are met through a sustained and integrated energy efficiency effort. G.L. c. 25, §22(b). While reduction in GHG emissions is not the primary goal of the GCA, the reduction in energy use and reduction in peak demand achieved by the energy efficiency programs also directly lead to a reduction in GHG emissions. Indeed, the energy efficiency plans exceeded expectations for GHG reductions over the past ten years. For example, the 2020 CECP anticipated GHG reductions for all cost-effective energy efficiency of 5.4MMTCO<sub>2</sub>e by 2020. As of the first quarter of 2020, the actual GHG reductions from all cost-effective energy efficiency since 2010 total at least 5.6MMTCO<sub>2</sub>e.

Under the current three-year energy efficiency plan, the Program Administrators expect to weatherize approximately 140,000 homes and provide 179,000 residential heating system incentives. The energy efficiency plans also consistently deliver benefits not only to the individual customers who participate but to the entire energy system, driving down costs associated with energy supply, distribution, and transmission—as well as costs of environmental compliance. This reduction in energy system costs provides benefits to all customers in the Commonwealth, including those who do not individually participate in the energy efficiency programs, because it drives down the distribution and transmission costs included on each customer’s utility bill.

## **B. Program Administrators’ Comments to the 2030 CECP**

### *1. Increased Building Electrification: Preliminary Cost Estimates.*

One of the CECP’s Strategy Actions for the building sector calls for an increase in electrification in the near term using the energy efficiency programs to incentivize air source and ground source heat pumps and to educate consumers. 2030 CECP, at 31. While the CECP does not quantify the number of heat pumps that will need to be deployed in 2022-2024, the 2050 Roadmap’s Building Sector Technical Report, at 7, estimates that heat pumps or other renewable thermal technologies will need to be installed in an average of 100,000 homes per year for the next 25-30 years.

The Program Administrators support the drive to increase electrification in the Commonwealth’s building heating sector, particularly where conversions to heat pumps can cost-effectively displace a current customer’s reliance on delivered fuels (*i.e.*, home heating oil and propane) or electric resistance heat. The Program Administrators have already begun to incentivize heat pumps as part of the current 2019-2021 Three-Year Plan, and preliminary statewide data shows that the Program Administrators installed over 2,000 heat pumps either partially or fully displacing oil or propane heating systems in 2019, and over 3,500 in 2020.

While the Program Administrators support a material increase in conversions to heat pumps, an increase in heat pump installations from 3,500 heat pumps installed in 2020 to 100,000 per year would require a very considerable investment. The current incentive level offered by the Program Administrators for a heat pump installation that displaces an existing heating system

averages about \$4,000 per home for residential customers that do not qualify for the Program Administrator's low-income programs (average costs in low-income programs are higher, as energy efficiency measures in these programs, including heating systems, are provided at no incremental cost to qualified participating customers). Simply multiplying \$4,000 times 100,000 heat pumps per year would equal \$400 million per year in incentives for heat pump conversions. Energy efficiency program incentives for customers would likely need to increase, however, in order to drive the widespread adoption of heat pumps envisioned by the CECP—and increase significantly for the low-income and moderate income customers who will need even higher incentives to make heat pumps economically feasible to install. In addition, there will be costs associated with program expenses such as customer outreach and engagement, workforce development and training efforts, driving contractor awareness and engagement, and system inspections and rebate processing. The Program Administrators estimate total program costs for heat pump installations could exceed \$600-700 million per year in order to meet the 100,000 heat pump per year installation target set by the 2050 Roadmap. These costs would be in addition to the customer contribution costs (the portion of the installed system cost not covered by incentives), which would likely average about \$6,000 per conversion.<sup>4</sup> The customer contribution would likely add at least \$600 million more per year, for a total estimated investment of \$1.2 to \$1.3 billion per year required to achieve 100,000 heat pump conversions.<sup>5</sup>

*2. Sustainable Growth and External Funding are Necessary to Exponentially Increase Heat Pump Installation in the Commonwealth.*

As indicated, a significant level of growth and market penetration will be necessary in the coming years to achieve an exponentially higher number of heat pump conversions per year as envisioned by the CECP and 2050 Roadmap. The Program Administrators will continue to grow their energy efficiency programs in a sustainable manner. 2013-2015 Three-Year Plan Order, D.P.U. 12-100 through D.P.U. 12-111, at 37 (2013). Sustainable growth helps foster long-term investment in the industry by essential market participants, and at the same time builds customer confidence that will contribute to the long-term success of the programs, including strategic electrification. A sustainable market allows market actors to confidently invest in building a business geared towards delivering heat pumps. Having a trained and available workforce will enable optimal equipment installation, which will ensure optimal equipment performance—an essential component of building confidence in heat pumps. Increased consumer education and awareness over time will be critical to gaining market acceptance. Thus, it is important to consider sustainability in building the necessary delivery infrastructure to make strategic electrification a long-term success.

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<sup>4</sup> Even if heat pump unit costs are driven down by the PAs' efforts, installation and labor costs—with wage levels at a reasonable level to support a robust contractor infrastructure—remain a material, and necessary, cost.

<sup>5</sup> The Program Administrators provide this cost estimate to help inform the discussion around heat pump installations going forward. The cost estimate is based on the most current, available data and is intended to set a broad framework for review—the actual numbers could be lower or higher.

In addition, careful consideration of bill impacts helps to ensure that energy efficiency can be implemented in a long-term sustainable manner that enjoys broad public support. The GCA requires the Department to consider the effects of rate increases on consumers prior to approval of cost recovery for energy efficiency efforts. G.L. c. 25, § 19(a). It is imperative that stakeholders, including the Program Administrators, the Department, the Department of Energy Resources, and the Office of the Attorney General, are sensitive to a potential negative backlash from consumers in the event material bill impacts undermine support for essential energy efficiency efforts.

Installation of heat pumps approaching the level of 100,000 per year, as set out by the 2050 Roadmap, will require external funding to ease customer cost burdens. For example, in Maine, the legislature provided supplementary funding to the Program Administrators for the state's energy efficiency programs in order to install a greater number of heat pumps. 2050 Roadmap, Building Sector Technical Report, at 20. The 2030 CECP should include a Strategy Action to pursue additional funding from the legislature for clean heating systems to help achieve the CECP's clean heating goals for the next ten years. The 2030 CECP should also note that the Commonwealth will pursue all available federal funding for building electrification that may become available under the Biden Administration. The CECP should contain contingency plans in case additional supplementary funding is not secured.

*3. Customer Bill Impacts Should Be Considered Holistically in the CECP's Strategies for the Building Sector.*

Bill impacts flowing from an increase in heat pump installations should be considered alongside the bill impacts associated with all other priorities of the energy efficiency programs and the 2030 CECP, including weatherization of existing buildings. See 2030 CECP, at 31. The CECP makes clear that the weatherization of a vast majority of the Commonwealth's existing buildings—which would make buildings as efficient as possible—is an important foundational element for the long-term success of a large-scale deployment of clean heating systems. Id. Weatherization measures such as insulation, air sealing, and duct sealing are essential to optimizing energy use and achieving GHG emissions reductions. The Program Administrators will continue to maintain a strong focus on weatherizing homes and businesses throughout the Commonwealth and see weatherization measures as a key driver of GHG reductions on their own as well as an important step in making buildings electrification-ready.

The CECP also includes a Strategy Action to expand access to energy efficiency and clean heating for low- and moderate income renters and homeowners in environmental justice (“EJ”) communities through targeted community-based incentives and outreach programs. 2030 CECP, at 31. The Program Administrators, working with the Commonwealth's low-income weatherization and fuel assistance network, have had a clear and consistent focus on serving our most vulnerable customers, with over \$900 million invested in low-income programs since 2010. Given the comprehensiveness of service in this sector and the limited resources of these customers, low-income programs are more expensive and require greater funding proportionally than other sectors. The Program Administrators remain committed to expanding access to energy efficiency for the low- and moderate income populations. All stakeholders should understand that the necessary increased resources dedicated to these communities will also increase the costs of the programs, which in turn will ultimately be collected from all customers in the Commonwealth,

including customers in those targeted communities, through surcharges on the electric or gas bill. As spending for the low- and moderate income populations provides the essential benefits of access to energy efficiency, these additional costs must be more expressly considered in finalizing the CECP.

The CECP does not acknowledge that increased costs related to the Strategy Actions outlined above—increased electrification, increased weatherization, and increased access for low- and moderate income renters and EJ communities—would result in high bill impacts for customers, and in particular electric customers. Moreover, if electric rates are too high, it will be that much more difficult to incentivize customers to switch from fossil fuel-based heating to an electric heat pump, as doing so would increase a customer’s electricity usage and costs. Thus, maintaining reasonable electric rates should be a key consideration of any decarbonization strategy, generally, and of the CECP, specifically.

The CECP does not contain any strategies for mitigating the costs that will be borne by customers if the recommended Strategy Actions connected to energy efficiency are implemented as proposed. The Program Administrators acknowledge the importance of each of the Strategy Actions, but the Program Administrators will nevertheless be constrained in implementing the strategies by a budget limited by the need to keep bill impacts reasonable. See G.L. c. 25, § 19(a). Consequently, the CECP should provide guidance as to how implementation of the Strategy Actions related to energy efficiency should be balanced with their significant costs and consequent bill impacts, and should consider additional funding and reasonable ramp-up rates to mitigate cost burdens. In short, to achieve the essential goals of the CECP, other funding sources—beyond energy efficiency surcharge rate recovery from customers—should be identified and significantly contribute to these efforts.

4. *The CECP’s Recommendation to Eliminate Incentives for Natural Gas and Delivered Fuels Heating Systems by 2024 is Premature.*

The CECP contains one Strategy Action to eliminate Program Administrator incentives for natural gas and delivered fuels equipment in new construction in 2022 and another Strategy Action to eliminate all natural gas and delivered fuels heating system incentives by the end of 2024. 2030 CECP, at 30-31. The Program Administrators agree the role of natural gas and delivered fuels heating systems needs to be closely reviewed to see how it can contribute to the 2050 goal of net zero GHG emissions. Indeed, each of the gas Program Administrators is actively involved in the ongoing investigation conducted by the Department into the role of gas local distribution companies (“LDCs”) as the Commonwealth achieves its target 2050 goals, D.P.U. 20-80. The Department’s investigation will solicit utility and stakeholder input to develop a regulatory and policy roadmap for the evolution of the gas distribution industry. D.P.U. 20-80, Vote and Order Opening Investigation, at 4 (2020). The Department will analyze the pathways identified in the 2050 Roadmap to determine whether and how the LDCs can implement each pathway in a cost-effective manner, while maintaining safe and reliable service for their customers. Id. Thus, the findings in D.P.U. 20-80 will be necessary to inform any decisions made regarding future natural gas heating system incentives. Therefore, the 2030 CECP should qualify its strategies on natural gas heating incentives to include a statement that any strategy going forward will be dependent

upon, and consistent with, the findings and directives of the Department's ongoing investigation in D.P.U. 20-80.

Elimination of the natural gas and delivered fuels heating system incentives by 2024 is also premature from a practical standpoint. Over the next several years, the Program Administrators will work to transform the market for clean heating technologies. In the interim, for those customers that do not have the ability or desire to adopt electric heating systems—whether due to financial barriers, technical and feasibility concerns with heat pumps, or concerns with the current generation mix used to produce electricity—there should continue to be incentives available to drive them to install the most efficient heating system, as long as those incentives deliver cost effective savings and benefits. This will ensure that those customers who are not yet ready to adopt electric powered heat pump heating systems will still be incentivized to install a more efficient heating system, thus contributing to immediate reductions in GHG emissions and overall GHG reduction goals. Continuing incentives for natural gas and delivered fuels heating systems will also ensure compliance with the GCA, which requires the Program Administrators to pursue all cost-effective energy efficiency savings for customers, without preference for a specific class or category of energy efficiency. G.L. c. 25, §§ 19(a), 21(a).

Further, in all events, the consideration of natural gas systems and delivered fuels systems should be disaggregated and they should be treated differently. Natural gas is a regulated fuel, offers important consumer protections, has different costs than delivered fuels, and drives significant carbon reductions relative to delivered fuel consumption today. Natural gas is also provided by a gas distribution system that will be further decarbonized in ways that will be a component of, and consistent with, the Commonwealth's climate goals. The 2030 CECP should therefore remain open to the possibility of disruptive technologies, including renewable natural gas, hydrogen blending, and renewable thermal energy, that that can drive reduced carbon emissions while also both leveraging existing gas distribution infrastructure as well as obviating the need for wholesale replacement of customer heating equipment. Accordingly, the Program Administrators recommend that natural gas and delivered fuels heating system incentives remain available in the near-term as a means to achieve the Commonwealth's long-term energy savings and climate goals.

##### *5. The Program Administrators Stand Ready to Assist in New Areas.*

The Program Administrators support the Commonwealth's goal of net zero GHG emissions by 2050 and look forward to helping the Commonwealth reach its GHG goal in a number of ways. The Program Administrators are committed to expanding, diversifying, and upskilling the workforce to meet these new challenges. Moreover, the Program Administrators have demonstrated their capacity to develop an infrastructure employing skilled workers and delivering cost-effective savings to customers, including a focus on equity, all while consistently providing detailed reporting and opportunities for stakeholder engagement. As EEA considers the CECP, it should be aware that the Program Administrators are prepared to explore new avenues and strategies to deliver GHG-reducing benefits and programs to customers at scale. Currently, the energy efficiency programs delivered by the Program Administrators are fundamentally resource acquisition programs subject to cost-effectiveness testing and a well-established regulatory

framework. With appropriate planning and coordination, the Program Administrators' expertise could be leveraged effectively in other areas, such as transportation and other electrification—either within or outside of the GCA framework and current cost-effectiveness structures—in order to help the Commonwealth achieve its goal of net zero GHG emissions by 2050. The Program Administrators have a talented team of dedicated professionals, working with an extensive vendor network and local implementation partners—all of whom are committed to exploring other ways in which they can be of assistance to the Commonwealth as the Commonwealth drives towards its 2050 goal of net zero emissions.

### C. Conclusion

The Program Administrators appreciate the opportunity to provide feedback to the EEA regarding the interim 2030 CECP. The Program Administrators respectfully request that the EEA consider the recommendations and issues discussed herein prior to finalizing the 2030 CECP.

Sincerely,

/s/ Sheri Borrelli

Sheri Borrelli  
Customer Programs and Products Manager  
The Berkshire Gas Company

/s/ Cindy Carroll

Cindy L. Carroll  
Vice President  
Unitil

/s/ Christopher Porter

Christopher Porter  
Director, Customer Energy Management,  
New England  
National Grid

/s/ Frank Gundal

Frank Gundal  
Director, Massachusetts Implementation  
Eversource Energy

/s/ Kimberly Drago

Kimberly Drago  
Senior Manager, Energy Efficiency East Region  
Liberty





March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

To Secretary Kathleen Theoharides,

General Motors LLC (GM) appreciates the Commonwealth of Massachusetts' efforts to address climate change through its policies and study efforts. We welcomed the recent presentation of the Commonwealth's interim Clean Energy and Climate Plan for 2030 ("Interim Plan"), which includes consideration of a broad selection of strategies for reducing greenhouse gas (GHG) emissions in the transportation sector. We value the opportunity to provide comments on this aspect of the Plan.

#### [GM is Committed to a Zero Emissions Future](#)

GM takes the challenge of climate change seriously and recognizes the role of the transportation sector in contributing to GHG emissions. This is a driving force behind our vision of a future with zero crashes, zero emissions, and zero congestion. Ultimately, GM believes that comprehensively addressing climate change in an effective and sustainable manner should begin with a clear, durable, economy-wide approach. The best policies are broadly applied and aim to incentivize economic actors to respond in ways that achieve emissions reductions at the lowest societal cost. GM agrees with the consensus opinion of most economists that predictable policies that leverage market mechanisms and place a monetary value on carbon dioxide emissions are the most cost-effective options and should be at the heart of any policy response. Ultimately, to achieve the greatest reductions and maximize efficiency we believe such policies should be applied on a national basis.

However, as we work toward the longer-term goal of a nationwide market-based policy to reduce emissions, GM recognizes that states can act by adopting state-based initiatives that reflect these principles while also developing complementary policies that accelerate emissions reductions in targeted sectors. The Commonwealth has demonstrated leadership in these areas, for example as a leading proponent for the Transportation and Climate Initiative (TCI), and GM commends Massachusetts for building on this legacy with the Interim Plan, which contains several promising transportation sector strategies.

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**general motors**

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## The Interim Plan Includes Several Positive Strategies Necessary for Reducing Transportation Emissions

Electric vehicles (EVs) are at the heart of any transportation decarbonization plan. As noted in the Interim Plan, for Massachusetts to achieve net-zero emissions, “fossil fuel use must be all but completely eliminated in on-road vehicles.”<sup>1</sup> GM recognizes this imperative, and it is one of the reasons we staked out a position as an industry leader in the design and manufacture of EVs. In fact, we were the first automaker to invest in and launch a mass-market, long-range EV for everyone—the Chevrolet Bolt EV—as the first step on our path to an all-electric future. More exciting EV models have debuted in recent months, including the Cadillac Lyriq, Chevrolet Bolt EUV, and GMC Hummer EV, promising greater variety in EVs than ever before. We know that to realize our aspiration to eliminate tailpipe emissions from our light-duty vehicles by 2035, we will need to offer compelling products with a full range of capabilities and body styles that meet diverse customer needs.

But automaker investments and EV model availability are just two of several important factors that must play a role in transforming and ultimately decarbonizing the transportation sector. Currently the market for EVs remains relatively small, with high battery costs driving up retail vehicle prices and inconsistent charging availability undermining consumer confidence in the utility of EVs. Therefore, there is an urgent need for public policies that support the growth of a profitable EV market. Appropriately, the Interim Plan has taken a broad view and includes several strategies that can effectively address these challenges.

### *T1: Cap Transportation Emissions and Invest in Clean Transportation Solutions*

GM applauds the Commonwealth for including sector-wide, market-based approaches in its Interim Plan. Not only can these approaches be effective at reducing emissions by design, but they can also serve as catalysts for the development of the EV market and for air quality improvements in disadvantaged communities. In fact, the Commonwealth could use revenues generated by these policies to help fund other strategies and goals outlined in the Interim Plan, including purchase incentives and charger deployment.

- **TCI.** GM encourages the Commonwealth to maximize the impact of TCI with strategic investments of the program’s proceeds, for example in meaningful point-of-sale EV purchase incentives—including potentially for used EVs—and charging infrastructure that meets a variety of needs. This should include programs to install highway, workplace, and residential charging for those living in multi-unit dwellings (MUDs).

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<sup>1</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

- **Regional Low Carbon Fuel Standard (LCFS).** LCFS policies have many benefits and GM strongly supports the inclusion of one in the Interim Plan. LCFS programs use the power of markets—introduced through credit/deficit trading mechanisms—and strong economic incentives to reduce GHG emissions and air pollution from the transportation sector. Crucially for transportation electrification, credit trading means such initiatives can create new revenues to fund EV purchase rebates and other consumer-facing incentives. And because typical LCFS program design creates credit generation opportunities specifically for public charging operators and fleet owners who use electricity as a transportation fuel, they can also stimulate private investment in infrastructure and fleet electrification where business cases might otherwise be challenged in the current market. (Similar benefits can extend to school and transit bus fleets.) In fact, regulators elsewhere have referenced LCFS credit revenue as a potential contributor to positive total cost of ownership calculations that would favor fleet-switching to EVs in the medium- and heavy-duty (MHD) segment.<sup>2</sup> With the Commonwealth moving to establish goals for MHD electrification, GM urges decision-makers to implement the full suite of necessary public policies in support of these goals, including LCFS, to maximize the likelihood of success.

### *T3: Reduce Upfront ZEV Purchase Cost Burden*

From our experience in the EV market, GM knows that customers want a no-compromise vehicle that is well designed, fun to drive, and most importantly delivers at least 300 miles of electric range on a full charge. At the same time, they want pricing in line with internal combustion engine vehicles. Battery costs, however, remain high despite advances in the technology and manufacturing, and the need to provide greater range to meet consumer expectations continues to put upward pressure on retail EV costs. Addressing this cost premium is critical for building sales momentum while the market and underlying technology matures.

Consequently, GM strongly supports the Interim Plan's emphasis on incentives across all vehicle segments. For light-duty vehicles, the best incentives offer a substantial discount and are available at the point of sale. Research finds that every \$1,000 offered as a rebate or tax credit increases the average sales of ZEVs by 2.6 percent.<sup>3</sup> In the MHD segment, high upfront vehicle prices are often cited as one of the most significant barriers to electrifying MHD vehicles and those costs can exceed the capital means of many fleet owners.<sup>4</sup> Incentives can make the difference for those looking to switch. Best practices in MHD incentives include a first-come, first-served approach that minimizes paperwork for fleets, meaningful rebate amounts, no scrappage requirement, and providing sufficient,

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<sup>2</sup> <https://ww3.arb.ca.gov/regact/2019/act2019/fsor.pdf>

<sup>3</sup> <https://www.sciencedirect.com/science/article/abs/pii/S0301421518302891>;  
<https://phev.ucdavis.edu/wp-content/uploads/2017/09/purchase-incentives-literature-review.pdf>

<sup>4</sup> <https://www.electrificationcoalition.org/wp-content/uploads/2020/11/Electrifying-Freight-Pathways-to-Accelerating-the-Transition.pdf>

durable funding. Rapidly growing demand for established incentives such as the California Heavy-Duty Vehicle Incentive Program (HVIP) only underscores the need for a substantial resource allocation to underpin these initiatives.<sup>5</sup> The Interim Plan appears to recognize all of this and showcases the Commonwealth's desire to accelerate the ZEV market's early momentum with effective public policy. Bringing these vehicles fully into the mainstream before 2030 will likely require incentives for much of the coming decade and GM encourages Massachusetts to remain committed to these programs.

*T4: Deploy Electric Vehicle Supply Equipment and Enable Smart Charging*

The Interim Plan's focus on charging infrastructure and smart charging is appropriate. In GM's experience, the lack of charging infrastructure causes significant anxiety among potential EV buyers and there are large unmet needs in both private and public settings, including workplaces, residences and in particular MUDs, and highway locations.

As noted above, GM believes both TCI and a regional LCFS represent valuable opportunities to accelerate installations in diverse locations, and the Interim Plan has taken an additional positive step in proposing the exploration of a utility-based residential charging incentive program. But the Commonwealth should also think creatively about other means of removing barriers to installation, including permitting reform and other "soft-cost" reduction measures, much as it has already demonstrated a willingness to innovate through smart charging initiatives and a rethinking of rate structures. Electricity rates are central to transportation electrification efforts and, as the Interim Plan notes, can adversely affect the business case for public Direct Current Fast Charging (DCFC) sites. However, the benefits of thoughtful rate design extend beyond DCFC operators, helping build and sustain consumer and fleet interest in EVs by ensuring cost savings compared with gasoline. Overall, GM believes that making progress in these areas will be key to the success of the Interim Plan and we support the Commonwealth's efforts.

*T5: Engage Consumers and Facilitate Markets*

All stakeholders have a role to play in improving consumer awareness of EVs and their benefits for the environment, public health, and owners and users. For its part, GM contributes to and participates in public-private partnerships focused on this very issue, including the "Drive Change. Drive Electric." campaign in the Northeast states, a collaborative project involving automakers and the Northeast States for Coordinated Air Use Management (NESCAUM).<sup>6</sup> Nonetheless, more is needed, and GM welcomes the Interim Plan's call for greater efforts by the Commonwealth. The actions described—funding pilot programs in high-impact, high-visibility applications like urban delivery and offering technical assistance for fleet owners and operators—appear positive, but the details matter. GM stands ready to engage with these efforts by offering our insights and perspectives to maximize impact.

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<sup>5</sup> <https://californiahvip.org/impact/>

<sup>6</sup> <https://www.nescaum.org/documents/drive-change-drive-electric-press-release-20180329.pdf/>

GM also suggests that Massachusetts consider how other actions could support this strategy. For instance, leading by example with an accelerated electrification program for the state fleet or promoting workplace charging installation. Seeing state-owned EVs on the road or a colleague's EV parked and charging at one's worksite offers the exciting possibility of creating a "second showroom" in the very places potential EV buyers live and work and drive, underscoring the day-to-day utility of EVs in settings and circumstances familiar to typical drivers and consumers.

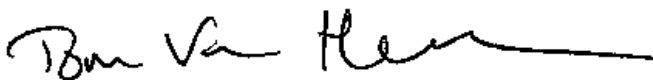
*T6: Stabilize Light-Duty VMT and Promote Alternative Transportation Modes*

GM recognizes that stabilizing VMT and supporting a full range of transportation options are potentially important elements of a climate plan that achieves deep emissions reductions in the transportation sector. Arresting growth in VMT or even achieving vehicle travel reductions could also deliver targeted improvements in air quality in communities bordering or in the vicinity of major roadways. To achieve this, a redoubled focus on smart growth policies, holistic investments in transportation infrastructure including transit services and bicycle and pedestrian facilities, and demand management tools could all play a valuable part. We look forward to working in partnership with stakeholders to explore these opportunities and welcome the Interim Plan's consideration of this important issue.

**GM Commends the Commonwealth for its Balanced Interim Plan**

Massachusetts' Interim Plan demonstrates a refreshingly balanced approach to achieving transportation emissions reduction goals—one GM particularly appreciates for harnessing the power of markets, elevating direct purchase incentives, and recognizing the importance of charging infrastructure. GM has always stressed that building a sustainable market for clean transportation that meets the challenge of climate change will require commitments and investments by all stakeholders and a full suite of strategies that tackle all aspects of the problem. The Interim Plan represents a welcome step in that direction. We appreciate this opportunity to provide comments and look forward to the final updates to the Plan.

Sincerely,



Tom Van Heeke  
Policy Lead, Mobility and Climate Change  
Global Public Policy  
General Motors Company

March 22, 2021

Kathleen A. Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
[gwsa@mass.gov](mailto:gwsa@mass.gov)

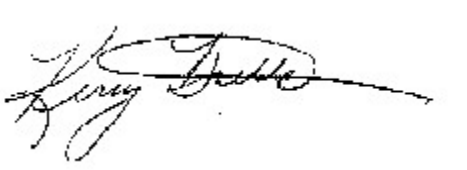
Re: Massachusetts Interim Clean Energy and Climate Plan for 2030 – Comments of Eversource Energy

Dear Secretary Theoharides:

On behalf of Eversource Energy, I am enclosing comments on the interim Clean Energy and Climate Plan for 2030 as submitted by William Akley, President, Gas Business and Craig Hallstrom, President, Regional Electric Operations (MA and CT).

Thank you for the opportunity to submit these comments. Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Kerry Britland", enclosed in a thin black rectangular border.

Kerry Britland

**EVERSOURCE ENERGY**  
**COMMENTS ON INTERIM 2030 CECP**

March 22, 2021

Submitted by:

William Akley, President, Gas Business

Craig Hallstrom, President, Regional Electric Operations (MA and CT)

## EXECUTIVE SUMMARY

The long-term interests of the residents and businesses of the Commonwealth of Massachusetts are well served by the Massachusetts 2050 Decarbonization Roadmap (“2050 Roadmap”)<sup>1</sup> and the interim Clean Energy and Climate Plan (“CECP”) for 2030 (“2030 CECP”).<sup>2</sup> The Commonwealth’s leadership in charting a path to a net zero carbon future is evidenced by the 2050 Roadmap and 2030 CECP, demonstrated by the thoughtful and thorough analysis characterizing the work product.

Eversource Energy is ready, willing and able to contribute to achievement of the ambitious carbon reductions contemplated by the 2050 Roadmap and 2030 CECP. Eversource has already committed to achieve carbon-neutrality in its operations by 2030, investing in clean energy and helping customers and the region reduce carbon emissions to secure a clean energy future.

As efforts move forward to achieve the clean energy future delineated by the 2050 Roadmap and 2030 CECP, it is important to maintain a line of sight on the practicalities involved in transitioning the energy delivery system to a new paradigm. Access to safe, reliable and reasonable cost energy is a necessity for every home, business and public-support function comprising the Commonwealth’s societal and economic foundation. Even a relatively limited failure or displacement of the energy delivery system is prone to create costly economic impacts, along with a human toll that escalates exponentially in relation to the loss or impairment of reliable and affordable energy service. Reliable and resilient energy service is a fundamental public necessity, critical to all facets of our society and economy, as well as our safety and security.

In that regard, it is easy to see how reliable and resilient energy service is vital to sustaining a high-tech economy encompassing technical, knowledge-based industries such as digital and biotechnologies, robotics, banking and institutions of higher education -- and how clean energy technologies would be utilized by these industries with success. However, the transition to a clean

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<sup>1</sup> On December 30, 2020, pursuant to the Global Warming Solutions Act of 2008, the Executive Office of Energy and Environmental Affairs (“EEA”), in consultation with the Department of Environmental Protection (“MassDEP”), the Department of Energy Resources (“DOER”) and other Commonwealth agencies, developed and issued to the public the 2050 Roadmap. The goal of the Roadmap is “to provide the Commonwealth with a comprehensive understanding of the necessary strategies and transitions in the near- and long-term to achieve Net Zero by 2050 using best-available science and research methodology.” 2050 Roadmaps at 7. Net zero emissions are defined as the “balancing of gross emissions with removals of greenhouse gases from the atmosphere.” *Id.* at 87.

<sup>2</sup> On December 30, 2020, Secretary of Energy and Environmental Affairs, Kathleen A. Theoharides, established a 2030 interim emissions limit of 45 percent below the 1990 greenhouse (“GHG”) emissions level to maximize the ability of the Commonwealth to achieve the 2050 GHG emissions limit. On the same day, EEA issued a request for comment on the interim 2030 CECP. Public comment on the interim 2030 CECP is open until March 22, 2021. The interim 2030 CECP builds on the 2050 Roadmap, the 2020 CECP, and the 2015 Update to the 2020 CECP. The interim 2030 CECP details the Administration’s plan for continuing to equitably and cost-effectively reduce GHG emissions through 2030. Interim 2030 CECP at 6.



energy future also needs to account for the fact that each and every dwelling in the densely urban, suburban and rural areas of the Commonwealth, as well as innumerable small and medium businesses, have a critical dependence on the availability of safe, reliable *and affordable* energy service. As the Commonwealth progresses through the essential effort to transform the energy model for a clean energy future, the *feasibility* of this transformation for all affected stakeholders is paramount. The interests of all constituencies must be considered, including businesses, residential customers, low-income customers, environmental justice communities and the investors providing necessary capital resources to support Massachusetts energy infrastructure, who must have confidence that these investments are predictable and sustainable. This continued investment is vital to support not only the infrastructure delivering energy to homes and businesses in the Commonwealth, but also the new sources of clean energy that will be necessitated by implementation of the 2050 Roadmap and 2030 CECP.

The 2050 Roadmap appropriately recognizes these considerations. Accordingly, to achieve the goals contemplated by the 2050 Roadmap and associated 2030 CECP, close collaboration and coordination among a broad range of stakeholders representing both public and private interests will be necessary.

There are three principles that should apply throughout the effort to achieve the goals of the 2050 Roadmap and 2030 CECP, while taking care to avoid overly deleterious impacts on any one sector:

- ❖ **Transparency.** The 2050 Roadmap and 2030 CECP should be informed by robust stakeholder engagement and should explicitly delineate the manner in which competing interests are balanced to achieve the expected result. Hard decisions will have to be made that will have an impact on customer costs and convenience. The general public -- and utility customers -- should be able to have a line of sight into the changes that will affect them and the associated costs.
- ❖ **Feasibility.** The strategies that will be adopted to implement the vision underlying the 2050 Roadmap and 2030 CECP should be feasible, meaning that the strategies, methods and approach are reasonably achievable from a technical, financial and logistical perspective and reasonably affordable given the important goals at hand.
- ❖ **Prioritization.** The strategies, methods and approach that will be adopted to implement the vision underlying the 2050 Roadmap and 2030 CECP should be prioritized so that the transformation of the energy delivery platform will be accomplished without damaging disruption of the economy. An orderly, transparent transition will be effective in achieving the important goals of the 2050 Roadmap and 2030 CECP with the greatest amount of public support for the adoption of changes.

Eversource Energy is inspired by the 2050 Roadmap and 2030 CECP and is rolling up its sleeves to innovate and advance the effort to achieve a net zero energy delivery platform in the Commonwealth. Undeniably, stopping the degradation of our environment and advancing climate change cannot be achieved by any one company, industry or state jurisdiction. For this reason, Eversource has abundant support for the Commonwealth's leadership in the decarbonization of the Massachusetts energy delivery model.

## COMMENTS OF EVERSOURCE ENERGY

### **Eversource Energy Operations in the Commonwealth**

**Eversource Energy** is a public utility holding company with dual headquarters in Boston, Massachusetts and Hartford, Connecticut. Eversource Energy is engaged primarily in the electric, natural gas and water distribution business through its wholly owned utility subsidiaries, including: NSTAR Electric Company, NSTAR Gas Company, and Eversource Gas Company of Massachusetts, operating in Massachusetts; The Connecticut Light and Power Company and Yankee Gas Services Company, operating in Connecticut; and, the Public Service Company of New Hampshire, operating in New Hampshire. Eversource Energy also operates Eversource Aquarion Holdings, Inc, a utility holding company serving water customers in all three states. Together, the Eversource Energy companies serve approximately 4 million electric, natural gas and water customers in Connecticut, Massachusetts and New Hampshire. In Massachusetts, Eversource Energy serves more than 2 million electric, natural gas and water customers.

**NSTAR Gas Company** is a Massachusetts natural gas distribution company, pursuant to G.L. c. 164, § 1. NSTAR Gas is engaged in the retail distribution and sale of natural gas to approximately 300,000 customers in 51 communities in central and eastern Massachusetts. Some of the larger communities served by NSTAR Gas include Cambridge, New Bedford, Plymouth, Worcester, Framingham, Dedham and the Hyde Park area of Boston.

**Eversource Gas Company of Massachusetts** is a Massachusetts natural gas distribution company, pursuant to G.L. c. 164, § 1. Eversource Gas is engaged in the retail distribution and sale of natural gas to approximately 330,000 customers in more than 60 communities in the greater Springfield area, southeastern Massachusetts and the Merrimack Valley.

**NSTAR Electric Company** is a Massachusetts electric distribution company, pursuant to G.L. c. 164, § 1. NSTAR Electric provides electric distribution service to more than 1.44 million in 139 communities in the Commonwealth. NSTAR Electric's service area encompasses the City of Boston and surrounding communities, extending west to Sudbury, Framingham, and Hopkinton, as well as communities in southeastern Massachusetts extending from Marshfield south through Plymouth, Cape Cod and Martha's Vineyard, and west through New Bedford and Dartmouth. To

the west, NSTAR Electric's service area encompasses the City of Springfield and surrounding communities, extending west the New York border and north to Greenfield and the Vermont border.

### Guiding Principles

As efforts move forward to achieve the clean energy future delineated by the 2050 Roadmap and 2030 CECP, it is important to maintain a line of sight on the practicalities involved in transitioning the energy delivery system to a new paradigm. Access to safe, reliable and reasonable cost energy is a necessity for every home, business and public-support function comprising the Commonwealth's societal and economic foundation. Even a relatively limited failure or displacement of the energy delivery system is prone to create costly economic impacts, along with a human toll that escalates exponentially in relation to the loss or impairment of reliable and affordable energy service.

Progress through the critically essential effort to transform the energy delivery model for a clean energy future must contemplate and account for the *feasibility* of this transformation for all affected stakeholders, including low-income customers and environmental justice communities, businesses as well as shareholders of investor-owned utilities that provide necessary capital resources for investment in Massachusetts energy infrastructure.

To assure that the implementation of strategies, methods and approach in pursuit of the goals of the 2050 Roadmap and 2030 CECP are embraced by the public, accepted by customers and are *successful* in the final result, there are three principles that should apply throughout the effort:

- ❖ **Transparency.** The 2050 Roadmap and 2030 CECP should be informed by robust stakeholder engagement and should explicitly delineate the manner in which competing interests are balanced to achieve the expected result. Hard decisions will have to be made that will have an impact on customer costs and convenience. The general public -- and utility customers -- should be able to have a line of sight into the changes that will affect them and the associated costs.
- ❖ **Feasibility.** The strategies that will be adopted to implement the vision underlying the 2050 Roadmap and 2030 CECP should be feasible, meaning that the strategies, methods

and approach are reasonably achievable from a technical and logistical perspective and reasonably affordable given the important goals at hand.<sup>3</sup>

- ❖ **Prioritization.** The strategies, methods and approach that will be adopted to implement the vision underlying the 2050 Roadmap and 2030 CECP should be prioritized so that the transformation of the energy delivery platform will be accomplished without damaging disruption of the economy. An orderly, transparent transition will be effective in achieving the important goals of the 2050 Roadmap and 2030 CECP with the greatest amount of public support for the adoption of changes.

Below, Eversource addresses each of the principles in relation to the economic and societal sectors that comprise the 2050 Roadmap and 2030 CECP.

### **Building Sector**

Eversource Energy supports the Baker Administration’s decision to establish the *Creation of Heat Commission/Task Force* (“Heat Task Force”) (2030 CECP at 32-33). As envisioned, the Heat Task Force would: (1) propose mechanisms needed to ensure the development of reliable and affordable clean heat solutions for buildings; and (2) help inform MassDEP’s long-term declining emissions caps on heating fuels (B3 Strategy Actions, 2030 CECP at 33).

The Heat Task Force is tasked with making critical decisions on emissions caps and building code standards (2030 CECP at 32-33). The Heat Task Force will make a recommendation to EEA before the end of 2021 regarding the structure and levels for long-term emissions caps on heating fuels based on the 2050 Roadmap, the 2030 emissions limits and the 2030 CECP. In addition, the Heat Task Force will propose statutory, regulatory, and financing mechanisms for the development of reliable and affordable clean heat solutions by the end of 2022, after considering findings from the investigation by the Massachusetts Department of Public Utilities (the “MDPU”) into the “Future of Heat,” which is docketed in D.P.U. 20-80.<sup>4</sup>

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<sup>3</sup> The distinction between technical potential and achievable potential will be important when assessing feasibility for certain decarbonization strategies. Although certain technologies or approaches may be commercially viable, it does not necessarily mean that there is widespread opportunity for deployment of that technology for a number of other reasons.

<sup>4</sup> This proceeding is officially docketed as: Investigation by the Department of Public Utilities on its own Motion into the role of gas local distribution companies as the Commonwealth achieves its target 2050 climate goals, D.P.U. 20-80 (October 29, 2020) (“D.P.U. 20-80”).

At the heart of this process, there should be transparency to implement policies effectively. Specifically, the Heat Task Force must have cross-sector representation to ensure a transparent process that results in equitable recommendations taking into consideration customers, communities and the economy. The Heat Task Force should include diverse representatives, including but not limited to individuals from the environmental, building, low-income, labor, contractor and utility industries. It is imperative that the voice of the customer is represented. Also, the Heat Task Force should not eliminate or obviate customer choice without the direct input and involvement of customers, helping them to understand the implications of the policies at issue. The Heat Task Force should be looking for ways to facilitate customer adoption and mitigate future backlash, including a cost analysis when developing new policies associated with emission caps, high-performance stretch energy codes, and state appliance standards. Eversource welcomes the opportunity to be a part of the Heat Task Force to offer its utility perspective.

As referenced above, the Heat Task Force will also have a direct and specific role in determining the future of heating sources. The 2030 CECP notes that the number of buildings using natural gas, fuel oil and propane for space and water heating must begin to steadily and permanently decline, and the deployment of heat pumps and building envelope improvements retrofits must become widespread. The implementation of this approach will have a material impact on the work necessary to maintain and operate the gas distribution system. Consequently, the impacts to the Eversource workforce should not be ignored in terms of both job loss and the cost and practicalities of workforce retraining and job creation in other economic segments, which would be implicated where the distribution of energy through the underground pipeline system is reduced or eliminated.

With regard to alternative heating sources, the 2030 CECP includes only limited mention of other low/no-carbon solutions, specifically geothermal network technology and renewable natural gas. Eversource is currently piloting a geothermal network demonstration on the distribution system and lessons learned from this pilot have the potential to inform all stakeholders about the technology and the contribution that it will make to emissions reductions goals. The 2030 CECP and the Heat Task Force should explore these and other options in more detail. Moreover, the 2030 CECP and the Heat Task Force should acknowledge overall cost implications in greater detail, specifically in the context of recommendations on greater electrification and lower carbon natural gas.

In addition, the 2030 CECP should specifically acknowledge and incorporate inputs from the parallel efforts of the MDPU to explore the Future of Gas in its D.P.U. 20-80 docket, to ensure that the regulatory structure governing the natural gas distribution system complements the Commonwealth's heating goals and appropriately structures the role of gas distribution companies in delivering safe and reliable energy to distribution customers. The investigation into the Future of Gas is designed to complement and further the objectives of the 2050 Roadmap by exploring all decarbonization pathways feasible to meet the Commonwealth's targets and provide the safe, reliable and affordable energy service that is critically needed by customers. Eversource and its gas distribution counterparts expect to run a robust stakeholder process throughout the proceeding so that many diverse stakeholders have the opportunity to provide feedback on the investigation and help guide the process as the gas distribution companies develop proposed regulatory structures and revised business models.

The Heat Task Force must also take specific note of the legal mandates on natural gas distribution companies to implement gas system enhancement plans ("GSEPs") that reduce methane through the repair and replacement of leak prone pipes. This critical link between gas system safety and emissions reductions should necessarily influence future methane regulations to ensure that GSEPs can meet both of these important public policies. Gas system reliability needs to be addressed further, specifically focused on the role of gas as it relates to the electric power grid and the electric power grid build-out that will be necessary before the electric system could be relied on to provide heating service to customers. Since implementing the GSEP in 2014, Eversource has reduced its overall methane emissions by over 30 percent through GSEP replacement projects. As a result, the GSEP program represents an important, ongoing and successful effort to reduce carbon emissions consistent with the goals of the 2050 Roadmap and 2030 CECP.

Eversource Energy has long experience working with residential, commercial, and industrial customers in reducing energy consumption and associated greenhouse gas emissions through the energy-efficiency programs administered by Eversource operating affiliates. Eversource operating affiliates in Massachusetts offer a wide array of energy-efficiency solutions for customers and has been a pioneer in developing innovative offerings such as Passive House and Net Zero initiatives. A key component of this success is the emphasis on finding the right solution for each customer. This may entail a highly customized solution for a complicated industrial process. For example, due to the presence of relatively old housing stock in the region, the solution that provides the

greatest amount of customer cost savings, emissions reductions and increased customer comfort may be something as simple as weatherization. Eversource has helped weatherize more than 40,000 homes in the Commonwealth in just the last three years; however, a large amount of untapped potential exists to achieve cost-effective greenhouse gas savings from weatherization. Given Eversource's deep understanding of the building thermal sector and previous efforts to decarbonize that sector, a more holistic approach to reducing emissions from within this sector is likely to be more productive than a narrow, technology-based approach.

Below, Eversource outlines specific recommendations related to the CECP and the building thermal sector. However, at a high level, it is important to retain all technology and savings pathways while in parallel allocating appropriate levels of funding and effort to dismantling non-financial barriers that prevent even more widespread adoption of energy efficiency. To that end, the CECP should explicitly contemplate strategies such as making additional funding available for stricter code compliance/enforcement, additional funding for the remediation of pre-weatherization health and safety barriers such as asbestos or knob and tube wiring, and legislation that encourages landlords to undertake more energy efficiency upgrades in rental units.

In the interim 2030 CECP, the Massachusetts Department of Energy Resources ("DOER") is charged to work to electrify heat; increase energy retrofits; and eliminate fossil fuel incentives. The interim 2030 CECP also lays out ambitious targets for carbon reductions in the building sector. Eversource appreciates the urgency of the climate crisis and supports the goal of deep retrofits of the Massachusetts building stock coupled with strategic electrification.

Although Eversource is broadly supportive of decarbonizing the heating sector through heat pumps and electrification efforts, it needs to be done in way that makes sense for all affected constituencies. Transitioning customers that currently heat their homes with delivered fuels or electric resistance heating to heat pumps may provide immediate economic benefits for those customers; however, a transition from natural gas heat to heat pumps may not result in similar benefits. Therefore, the 2030 CECP should prioritize converting customers with delivered fuels or electric resistance heating to heat pumps as these customers will reap immediate financial benefits while also generating greenhouse gas reductions.

In addition, Eversource is concerned about the assumed pace of these changes, as outlined in the 2030 CECP. Electrifying 1,000,000 housing units by 2030 would require profound changes to the

Massachusetts heating system market on the part of manufacturers, installers and, most importantly, customers. The number of residential heat pumps currently installed annually in Massachusetts through the MassSave energy efficiency program is around 15,000.<sup>5</sup> To achieve 1,000,000 installations by 2030 would require an installation rate of approximately 100,000 heat pumps annually. A shift of that magnitude is not likely feasible by 2030, for the following reasons:

1. Nearly 60% of Massachusetts households currently heat their homes with natural gas.<sup>6</sup> As referenced above, the customer economics of electrification as compared to gas are currently poor. In the absence of changes to the pricing of either fuel or continued substantial improvements to the efficiency of heat pumps, widespread adoption of heat pumps by natural gas customers would not be expected.
2. Adding 1,000,000 electric air-sourced heat pumps to the existing distribution system will add load that is not currently contemplated by the system design and existing infrastructure. Time and investment may be required to accomplish this feat, including the need to upgrade and/or replace individual electric service line capacity constraints.
3. Manufacturers will need time to increase production and distribution capacity.
4. The workforce needs time to become familiar with heat pump installation best practices.
5. Customers will need to be educated on the pros and cons of heat pumps and how to properly use heat pumps once they are installed.

Given these concerns, Eversource recommends that the 2030 CECP examine alternative near-term strategies for meeting the climate targets that are more easily accelerated over time, allowing for a more realistic transition and adoption pace.<sup>7</sup> Laying the foundational groundwork to prepare the heat-pump industry and customer base for a “market transformation” to heat pumps is an appropriate near-term goal. This necessarily includes elements of workforce development, customer education and working with heat pump manufacturers to increase product efficiencies and to ensure production capacity is able to meet anticipated demand.

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<sup>5</sup> <https://www.masssavedata.com/Public/MeasuresDetails>

<sup>6</sup> <https://ma-ecac.org/wp-content/uploads/RES-1-Residential-Baseline-Study-Comprehensive-Report-2019-04-30.pdf>

<sup>7</sup> The goal in the 2050 Roadmap of 3,000,000 households electrified by 2050 is achievable with an interim 2030 CECP target of 500,000 homes, allowing for a much more reasonable short-term ramp rate and giving the market time to transform.



Further, this also includes strategies like doubling down on the installation of weatherization measures to ensure that heat pumps can properly heat and cool spaces when the units are eventually installed. This may also include discontinuing energy efficiency incentives for central air conditioning units and substitution of MassSave incentives that exclusively incentivize central heat pumps, which may initially be used only for cooling, but that could eventually be used to offset existing fossil fuel heating systems. Similarly, another near-term strategy would include getting more mini-split heat pumps into homes and businesses that are initially used for cooling purposes only but could subsequently be used for heating purposes. This would help get customers familiar and comfortable with heat pump technology and would demonstrate to manufacturers that there is a viable market for these products.

Any heat pump efforts have to take into account the potential disproportionate impacts on low- and moderate-income customers, customers in Environmental Justice Communities, and renters. Depending on a customer's existing heating source, encouraging customers to adopt heat pumps may have ongoing operating cost implications, which may have an outsize impact on financially vulnerable customers. An increased focus on mitigating pre-weatherization barriers and subsequently installing more weatherization measures is a future proof investment that will produce an immediate benefit for these customers and will also better enable heat pump opportunities in the future. The 2030 CECP should explicitly acknowledge this as a goal in the short term in furtherance of the longer-term goal of heating electrification.

Lastly, Eversource has serious concerns about the 2030 CECP's proposal to discontinue MassSave support for high-efficiency fossil fuel heating systems. Until it is confirmed that the heating system market will be transformed fully to electrification, it is important that every heating system be installed as efficient as possible. The MassSave incentives are an important component to ensuring that efficiency and should be continued until independent third-party evaluations indicate the incentives are not necessary.

Eversource is supportive of the 2030 CECP's building envelope improvement targets. Although these targets are ambitious, the market for these services has been well established through the efforts of the MassSave Program Administrators over the last decade. Making the existing building stock as efficient, safe, and comfortable as possible is an absolute priority for Eversource.

Eversource is confident that the substantial experience gained to date can be leveraged to expand these efforts and accelerate the pace of weatherization over the next decade.

### Electricity Sector

The interim 2030 CECP identifies that offshore wind will be the supply backbone with solar, energy storage and other clean energy resources relied on as needed (Strategy E4 and E5, 2030 CECP at 41-42). Eversource agrees that offshore wind will play a significant role in the development of a low-cost decarbonized electric system and supports the 2030 CECP goal of developing a mature offshore wind industry. As the Commonwealth looks to procure an additional 6 GW of offshore wind between 2030 and 2040, it will be important to fully consider alternatives to the current long-term contracting model under the Green Communities Act. As noted by the DOER's May 2019 Offshore Wind Study, having a high amount of clean energy procured under long-term contracts may result in impacts to the wholesale markets and ultimately shift risks to customers as energy markets change.<sup>8</sup> Supporting a mature offshore wind industry will necessarily require supporting pathways to cost-competitive market solutions.

In the near-term, Eversource is committed to supporting the upcoming and planned offshore wind solicitations. Eversource encourages the Commonwealth to provide more clarity regarding the procurement schedule through 2030. This will allow for better planning not only for procurements, but also for the broader development of the offshore wind workforce, supply chain and interconnection planning. The Commonwealth should also fully explore opportunities to coordinate procurements with other states in the region to sustainably develop the offshore wind industry and ultimately better capture savings for Massachusetts customers.

Importantly, bringing a large volume of offshore wind beyond that currently contemplated under Massachusetts law will require interconnection and transmission solutions not present on today's system. To drive renewable deployment at the scale contemplated by the 2030 CECP, it will require a flexible, responsible, reliable and cost-effective grid. As noted above, Eversource

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<sup>8</sup> Department of Energy Resources Offshore Wind Study at 12 (2019), *available at* <https://www.mass.gov/doc/offshore-wind-study/download>.

supports regional siting reforms to streamline the development that will be needed to support growth in offshore wind.

Additionally, the energy transformation envisioned in the 2030 CECP will require siting and building energy infrastructure not only in Massachusetts, but across the region. Creating more favorable conditions for siting infrastructure will be a historic undertaking and require a fundamental shift in mindset. Under current conditions, it will not be possible to build the infrastructure necessary to support the 2050 Roadmap energy future. Additionally, the amount of offshore wind contemplated to be contracted by utilities in the 2030 CECP will have significant ramifications on the utilities and will need policy support.

The success of decarbonizing the electric sector will also require collaboration with state, regional and federal stakeholders.

In addition to supporting further offshore wind development, Eversource is committed to enabling the interconnection of clean resources while maintaining system reliability and resiliency. To that end, Eversource is actively participating in the MDPU's investigation in D.P.U. 20-75, which is exploring ways to reform system planning for distributed generation interconnection and new methods of cost allocation to more proactively build out the distribution and transmission system to accommodate significant growth of solar in the near term. Eversource is enthusiastic about the direction of the MDPU's investigation and would like to emphasize that successfully following through on the comprehensive policies to address system investments will be critical to meeting the 2030 CECP goal of facilitating a path for an additional 2 GW of new distributed generation between 2025 and 2030. To better inform and facilitate comprehensive system planning for future distributed generation, the CECP should consider more granular annual deployment targets within the five-year 2 GW target.

Eversource supports the premier role of solar and offshore wind in the future energy supply mix. However, it is critical to avoid over-reliance on a solitary energy resource. A lack of diversity in energy supply creates a potent risk of failure for energy delivery, which has an excruciating human toll when exigencies occur. Therefore, the Commonwealth should support an "all solutions" approach that does not overly favor any specific technology. Current solutions such as co-optimization of reliability and offshore wind on Cape Cod, for example, should also be supported. The most effective pathway to achieve a clean energy supply will utilize all resources, including

solar, storage, offshore wind, new transmission, distributed energy resources and natural gas supply for balancing.

As part of an “all solutions” approach, the Commonwealth should also further study the impact of intermittent resources to ensure peaking resources are properly considered in the mix.

### **Transportation Sector**

The Commonwealth has laid out laudable, but ambitious transportation goals in the 2050 Roadmap and 2030 CECP, particularly in relation to the goals of near-complete electrification of light-duty vehicles and low- and zero-carbon fuels for medium and heavy-duty vehicles.

Overall, these goals and the strategies outlined to achieve the goals align with the Eversource’s strategy of becoming a catalyst for clean energy by promoting EV adoption, investments in EV infrastructure and the development of solutions to optimize the resulting increased electric load.

Eversource recognizes that electric utilities are uniquely positioned to enable many of the transportation electrification solutions. The 2030 CECP strategies provide a framework to continue to pursue opportunities and execute programs to expand public charging networks for light duty vehicles, while recognizing the significance of an increased focus on residential charging, including load shifting solutions.

Eversource also appreciates that the 2030 CECP develops strategies for medium and heavy-duty fleets with practical challenges in mind. Load increases will be significant, requiring load-shifting strategies as well as resiliency and redundancy strategies. Significant system planning will be needed for transit and other large fleet deployment. The inclusion of long-term system planning, resiliency and redundancy will become critical as fleet electrification accelerates.

Eversource is supportive of the strategies in the 2030 CECP, including encouraging the development of a rate that supports initially low load factor DC Fast Charger installations; the further development and expansion of load-shifting solutions (including managed charging); and, developing fleet advisory engagement services and pilots for medium and heavy-duty fleets. Eversource also appreciates the emphasis on equity in achieving these goals and will continue to work with stakeholders to find solutions to meet the needs of all customers.

### **Other Sources of Emissions**

The 2030 CECP recommends exploring additional regulations to minimize SF<sub>6</sub> emissions from electric distribution and transmission equipment. Any modifications to SF<sub>6</sub> regulations need to reflect current available technology, prudence, and other considerations. Alternatives to SF<sub>6</sub> are not readily available. The increase of electrification envisioned by the 2030 CECP will necessarily require expansions of the electric system and, therefore, increased use of SF<sub>6</sub>. Overly restrictive regulation of SF<sub>6</sub> may be counterproductive to the overall electrification and emissions reductions goals of the Commonwealth. Eversource encourages a holistic view of these potentially competing issues.

### **Conclusion**

Eversource Energy is ready, willing and able to contribute to the ambitious efforts to reduce carbon emissions as contemplated by the 2050 Roadmap and 2030 CECP. Eversource is prepared to innovate and actively advance the effort to achieve a net zero energy delivery platform in the Commonwealth. Eversource looks forward to collaboration with the Baker Administration and interested stakeholders to develop plans to achieve the Commonwealth's 2050 net zero emissions goal. The comments and recommendations put forth herein are intended to enable progress and to assure that the interests of all constituencies, including individual customers, are devoutly considered throughout in terms of transparency, feasibility and priority.



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March 22, 2021

Secretary Kathleen A. Theoharides  
Secretary of Energy and Environmental Affairs  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St. Suite 900  
Boston MA 02114  
Submitted via email to [gwsa@mass.gov](mailto:gwsa@mass.gov)

**Re:** Massachusetts Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides,

These comments are submitted by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI), on behalf of our member companies, regarding Massachusetts Interim Clean Energy and Climate Plan for 2030.

AHRI is the trade association representing manufacturers of heating, cooling, water heating, and commercial refrigeration equipment. More than 300 members strong, AHRI is an advocate for the industry and develops standards for and certifies the performance of many of the products manufactured by our members. In North America, the annual output of the HVACR and water heating industry is worth more than \$44 billion. In the United States alone, the HVACR and water heating industry supports 1.3 million jobs and \$256 billion in economic activity annually.

Many of AHRI's members include the nation's largest manufacturers of products, such as electric equipment used for space and water heating equipment for use in residential and commercial end-use applications, that can assist the Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC) goal of emissions reducing policies, programs, or actions that contribute to achieving the statewide emissions reductions established in Massachusetts Interim Clean Energy and Climate Plan for 2030. As an industry, we believe there are important considerations that must be made by policymakers when assessing electrification and building decarbonization policies. AHRI hopes to be a resource and partner in Massachusetts's decarbonization efforts.

## AHRI Recommendations

AHRI reviewed the Interim Clean Energy and Climate Plan for 2030<sup>1</sup> and recommends that Massachusetts work to:

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<sup>1</sup> Accessed via <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

- conduct emissions and cost savings analyses consistent with the full spectrum of product efficiencies and available technologies in North America;
- use available data sources (EIA, CBECS, etc.) to establish a base line distribution of fuels and equipment within the state at the household and individual commercial building level;
- shift building codes to performance-based requirements and require that existing large commercial buildings track energy usage;
- ensure that any recommendations demonstrate cost effectiveness and equity for all residents;
- consider grid reliability and capacity as it impacts critical services provided by HVACR and water heating equipment for all residents;
- adopt an incentive program to encourage the adoption of emissions-reducing appliances, and update its study of market efficiency to include a market shift anticipated by programs that incentivize improved efficiency equipment;
- follow a technology agnostic approach; and
- adopt the latest version of ASHRAE 90.1 or its equivalent into their building codes.

AHRI recommends that Massachusetts conduct emissions and cost savings analyses consistent with the full spectrum of product efficiencies and available technologies in North America.

AHRI appreciates the Massachusetts' diligence in accurately capturing the full spectrum of products installed in the state as reported in its Buildings Sector Report.<sup>2</sup> A thorough analysis of electricity generation capabilities and limitations is an important step in determining a pathway to minimize greenhouse gas emissions. For example, locations where coal is a dominant electricity-generation fuel, building electrification could result in an increase in greenhouse gas emissions and would benefit more from market-based incentives to upgrade the current mix of heating equipment.

Performance-based decarbonization policies that do not favor certain technologies over others will prevent inadvertent emission increases while electricity generation still relies on inefficient and carbon-intensive power plants. For example, dual-fuel heating systems are comprised of an electric heat pump and a natural gas furnace. The heat pump is used to meet the heating load of a building until it reaches capacity, at which point the gas furnace is used to meet the supplemental building heating load and maintain the heating setpoint temperature. Incorporating these systems into decarbonization policy in Massachusetts is a critical step to avoiding increased emissions and ensuring sufficient heating in colder climates.

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<sup>2</sup> Buildings Sector Report. December 2020. Accessed via <https://www.mass.gov/doc/building-sector-technical-report/download>.

A study by U.C. Davis explains that natural gas and other fossil fuels supply baseload and peak electricity demand in Massachusetts. Due to this higher marginal emissions rate, additional electricity use will generate higher emissions than that of natural gas.<sup>3</sup> This should be incorporated into life cycle analyses of emissions of heating equipment.

AHRI strongly supports further development of Massachusetts study of the full range of HVACR equipment within the state including all efficiencies and capacities of furnace, heat pump, and other potentially targeted products to better understand the distribution of fuels and equipment used within the state. This will allow Massachusetts to create more effective policies that help achieve its goals in the instances where there are cost-effective market-based drivers for consumers to switch to new or more appropriate technologies. Use of this inventory will better estimate the energy savings potential the state can achieve.

**AHRI recommends that Massachusetts use available data sources to establish a base line distribution of fuels and equipment within the state at the household and individual commercial building level.**

Based on AHRI's analysis of the U.S. heat pump market,<sup>4</sup> Massachusetts likely contains approximately one percent of all heat pumps installed across the country. Residential buildings are powered primarily by natural gas in Massachusetts (46% in 2018, according to the Lawrence Livermore National Laboratory (LLNL)).<sup>5</sup>

Massachusetts can use its understanding of the baseline market of HVACR equipment to analyze the efficacy of its policies. With this understanding, Massachusetts will also be able to share how its market transformation can occur. AHRI looks forward to sharing data and resources with Massachusetts to compare data to ensure this robust analysis is as accurate as possible.

**AHRI recommends that Massachusetts shift building codes to performance-based requirements and require that existing large commercial buildings track energy usage.**

The preliminary draft recommendations state that Massachusetts should measure energy usage and make that information accessible to inform later energy performance standards for commercial buildings. AHRI supports the requirement for private commercial buildings greater than 10,000 square feet where the benefit is more likely to justify the significant cost of energy

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<sup>3</sup> Nelson Ditcher, Aref Aboud, [Analysis of Greenhouse Gas Emissions from Residential Heating Technologies in the USA](#) p.8 (2020).

<sup>4</sup> The installed base of HVACR and water heating equipment is publicly available from the Energy Information Administration (EIA) [Residential Energy Consumption Survey](#) (RECS) and [Commercial Building Energy Consumption Survey](#) (CBECS).

<sup>5</sup> LLNL Energy Flow Charts. Accessed via <https://flowcharts.llnl.gov/commodities/energy>.



modeling that is unique to each building.<sup>67</sup> AHRI believes this will help Massachusetts achieve its future goals, as identified in the Interim Clean Energy and Climate Report for 2030.<sup>8</sup>

**AHRI recommends that Massachusetts ensure that any recommendations demonstrate cost effectiveness and equity all residents.**

AHRI encourages Massachusetts to consider consumer equity in its decarbonization policies. Policies dependent upon building electrification for reducing emissions, if not carefully executed, may place an undue burden on low-income housing. Cost impacts from this switch are likely to disproportionately affect low-income households. AHRI recommends that Massachusetts perform a holistic cost-benefit analysis of any decarbonization policy and ensure that any recommendations are equitable to all its residents.

**AHRI recommends that Massachusetts consider grid reliability and capacity as it impacts critical services provided by HVACR and water heating equipment for all residents.**

Separately, as decarbonization policies become more pervasive, load on the grid increases which could limit energy reliability in Massachusetts. In addition, in rural areas where the electricity grid is unreliable, families and businesses may have to rely on other energy sources especially for heating due to frequent failures in power supply.

**AHRI recommends that Massachusetts adopt an incentive program to encourage the adoption of emissions-reducing appliances and update its study of market efficiency to include a market shift anticipated by programs that incentivize improved efficiency equipment.<sup>9</sup>**

AHRI supports incentive programs (including for training) to encourage the adoption of high efficiency appliances, such as air source heat pumps (ASHP), water source heat pumps (WSHP), and ground source heat pumps (GSHP). As Massachusetts has identified, incentive programs have

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<sup>6</sup> New York City Mayor Michael Bloomberg signed the Greener, Greater Buildings Plan in 2009 that required facility owners of private buildings over 50,000 square feet to annually benchmark energy. The area requirement for public buildings – 10,000 square feet – was considerably lower and conducted for public benefit rather than a cost justified emissions reduction measure. Only after a decade of benchmarking was the market ready to extend the requirement for private buildings to 10,000 square feet. Buildings with complex systems have greater opportunities to improve efficiency through lower-cost options, such as updates to the building automation system, whereas smaller buildings, with simpler systems, have few opportunities beyond schedule optimization and proper equipment maintenance.

<sup>7</sup> Note that energy modeling costs were not included in the report and should be considered as they are significant and unique by building.

<sup>8</sup> Interim Clean Energy and Climate Report for 2030. December 30, 2020. Page 33. Accessed via <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>.

<sup>9</sup> Incentives for the adoption of high-efficiency appliances provides states with an effective means of driving the use of high efficiency appliances without adopting requirements that conflict with Department of Energy regulations federal preemption clause to ensure that the unintended consequences of the creation of a patchwork of regulations do not develop across the country.

been effective in driving the adoption of high efficiency appliances in other jurisdictions. For example, groups like the [Consortium for Energy Efficiency](#) (CEE) have been successful in driving the installation of higher efficiency equipment across the U.S. In 2017, demand side management (DSM) programs saved approximately 33,246 GWh of electricity.<sup>10</sup>

Massachusetts should update its study of market efficiency to include a market shift anticipated by programs that incentivize improved efficiency equipment as the federal equipment efficiency incentives will likely lead to a market shift that Massachusetts should include in its assumptions. For example, AHRI has found that owners of existing buildings can achieve substantial energy savings by replacing outdated technology with both fuel-burning and electric new space heating products. This replacement of equipment should also be incentivized.

AHRI supports Massachusetts' consideration of the potential for incentivizing dual fuel heat pump/furnace systems – which do not require a heavy increase on electrical service panel load as these systems can dramatically lower building emissions and help manage peak electric loads. Any transition to pumps in existing homes should be incentivized and include the cost of an electric service panel increase.

Also, homes that do not have air conditioning, ducting will increase the cost to consumers. Beneficial electrification programs should consider these costs (e.g., electrical service panels and ducting) and prioritize whole-home and whole-building solutions to ensure any policy results in reduced greenhouse gas emissions.

**AHRI recommends Massachusetts follow a technology agnostic approach.**

All technology providing significant energy and environmental benefits should be evaluated, regardless of fuel type considering consumer choice, technological neutrality, and ultimate affordability in terms of both upfront and operating costs.

**AHRI recommends that Massachusetts adopt the latest version of ASHRAE 90.1 or its equivalent into Massachusetts's building codes.**

ASHRAE 90.1 is a model code that sets standards for HVAC equipment, boilers, and water heaters and is regularly updated to ensure its applicability to the latest technologies. Updating Massachusetts building codes with the latest version of ASHRAE 90.1 or its equivalent will maximize the efficiency of equipment and the relevance of building requirements within the state. Adopting the latest version of ASHRAE 90.1 would also introduce an opportunity to align building requirements among both state and local jurisdictions.

AHRI is appreciative of these opportunities to provide feedback and welcomes a dialogue with Massachusetts on this important issue.

Should you have any questions regarding this submission, please do not hesitate to contact me.

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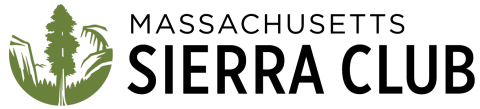
<sup>10</sup> [CEE Annual Industry Report 2018 State of the Efficiency Program Industry](#)

Respectfully,

*Helen Walter-Terrinoni*

Helen Walter-Terrinoni  
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cc: Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC)



*March 22, 2021*

*Kathleen Theoharides  
Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114*

Dear Secretary Theoharides,

Thank you for accepting public input on the interim 2030 Clean Energy and Climate Plan. We are grateful for the Executive Office of Energy and Environment Affairs' (EEA) work and leadership to craft a vision for the future. As you know, and as indicated in the UN's 2018 Intergovernmental Panel on Climate Change (IPCC) report, the next 10 years are a "make or break" opportunity to respond to the climate crisis.

Please incorporate the following suggestions into the final 2030 CECP. The CECP should lead with an equity-focus on each policy. Environmental justice communities and energy burdened residents must be prioritized in the state's work to cut emissions. Impacts should also be measured to ensure equity of access. Clarify the obligations of cities and towns. The plan should be a master plan that provides a centralized statement of necessary municipal actions and obligations. The plan should call for an annual progress report on metrics that are easily discerned, such as the number of new EVs on the road and rebates awarded and the amount of TCI-P revenue invested in underserved and overburdened communities.

### **Transportation**

- The 2030 CECP should set 100% electrification targets for transit and school buses (2030), commuter rail (2035), and municipal and state (2035) fleets
- The 2030 CECP should include a new strategy action focused on public transit and active transportation options like biking and walking. In addition, mixed-use development near transit and active mobility options is critical to reducing vehicle miles traveled (VMT).
- The Commonwealth should commit to offering the MOR-EV rebate at the point of purchase by 2021 and implement a new and used EV rebate program for moderate- and low-income residents by 2022.
- Massachusetts should begin TCI-P equity work immediately and create a detailed plan for public engagement and decision making process on how TCI-P revenue will be spent, indicating investment targets for transit, walking, and



biking infrastructure. In addition, the 2030 CECP should commit to increasing investment of TCI-P proceeds in EJ communities from 35% to at least 70%.

- Adopt higher sales targets of the Advanced Clean Truck (ACT) Rule and commit to 50% of medium- and heavy-duty vehicle sales being electric by 2030 and 100% zero-emission sales by 2045.

### **Buildings**

- The 2030 CECP should establish net-zero opt-in stretch code in 2022 and statewide base code adoption by 2025.
- The plan must stop all fossil fuel incentives through MassSave by 2022.
- Set mandatory GHG emissions reduction limits on the building sector statewide by 2022 (enforcement starting by 2025) via a declining limit on CO<sub>2</sub>e from heating fuel suppliers and investment in comprehensive whole home retrofits for low and moderate income households and small businesses that include health and safety repairs, weatherization, and electrification.
- Finally, a climate bank funding program should be created to help pay for the transition.

### **Electric Generation**

- The 2030 CECP should raise the clean energy standard to 100% renewable electricity by 2035, including a minimum target of 6 GW offshore wind installed by 2030 and a minimum target for 9300 MW of solar by 2030.
- Create targeted incentive programs for local renewable electricity for low and moderate-income, energy burdened residents, and residents of EJ communities. These communities should receive at least 50% of statewide clean energy investments at no cost.
- Remove clean energy incentives for woody biomass or solid waste combustion
- Do an assessment of grid infrastructure upgrade needs for electrification of housing and transportation and significant additional renewable generation by 2022 and start implementation in 2023 with a prioritization investment in low income communities at no costs to energy burdened residents.
- Stop further procurements of electricity from large Canadian hydro generators.

Thank you for your consideration of these important issues.

Signatures and additional member comments continue on the following pages.

*A strong climate action plan does NOT include burning fossil fuels like wood. Biomass has no place in Massachusetts and must not be supported by taxpayers!*



Sincerely,

Dianne Plantamura  
22 Mill St  
Groveland, MA

*Action to mitigate climate change is essential for the welfare of our children, grandchildren and all future generations. What we do now, MATTERS! If we don't take action now, we will be condemning future generations to a sick planet and an environment that will cause great harm to them.*

Sincerely,

Brian Gingras  
52 Bradford Commons Ln  
Braintree, MA

*As new residents of the state we are very excited about the proposed plan, S. 9, the Omnibus Bill. It has become the envy of friends in our previous home state. Let's set the standard!*

Sincerely,

Michael Kline  
50 S Silver Ln  
Sunderland, MA

*As someone who enjoys kayaking, skiing, fishing and plenty of outdoor activities I believe we need to do everything possible to protect our environment so future generations have the same opportunities in a clean and wildlife rich outdoors!*

Sincerely,

Michael Guilbault  
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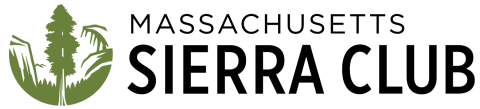
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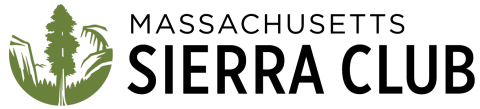
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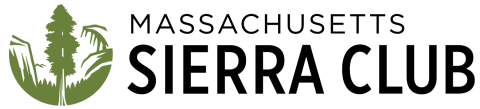
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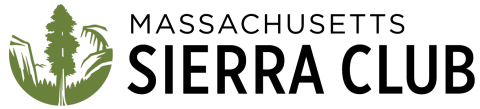
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**VIA EMAIL AND ONLINE PORTAL**

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
gwsa@mass.gov

**Subject: Environmental Entrepreneurs (E2) comments on the Interim Clean Energy and Climate Plan**

**To Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:**

I write on behalf of the 600+ members and supporters of the **New England Chapter of Environmental Entrepreneurs (E2)**, a nonpartisan group of business leaders, investors, and professionals from every sector of the economy, with comments on the interim 2030 Clean Energy and Climate Plan (CECP).

Thank you for developing this important and helpful update to the original Global Warming Solutions Act (GWSA) plan, as well as the new greenhouse gas reduction goal for 2030. We appreciate your hard work in creating this plan and the underlying 2050 De-carbonization Roadmap study. We saw first-hand at the Implementation Advisory Committee meetings and public workshops your effort to build a strong plan that incorporates stakeholder concerns and moves the Commonwealth toward our Net-Zero economy and future,

Nonetheless, we believe that the final plan could be better if revised in the following ways.

**The Plan will be stronger if it further emphasizes the common policies and measures that apply to all sectors of the clean economy we seek.** Cross-sector commitments and investment priorities should be highlighted in a top level, separate section.

**It must commit to using equity and justice and the social cost of carbon in all reviews as a requirement for all Commonwealth decisions.** These requirements should be spelled out in a separate section of the CECP and apply across all Administration branches. The Commonwealth will make smarter and more sustainable regulatory actions and investments if these are part of its review and decisions.

**Environmental Entrepreneurs • [www.e2.org](http://www.e2.org) • [facebook.com/e2.org](https://facebook.com/e2.org) • [@e2org](https://twitter.com/e2org)**

Mid-Atlantic • Midwest • New England • New York • Northern California • Pacific Northwest • Rocky Mountains • San Diego • Southern California

**The Plan must support innovation and implement existing, sustainable measures in all economic sectors for all of the people of Massachusetts.** Our workforce must have good training and access to clean mobility and jobs in both urban and rural areas.

**Energy efficiency and power generation without carbon emissions must continue to be emphasized as a means of achieving the needed reductions.** Solar energy as a local generation source has been severely stymied due to an older electric grid. Every effort should be made to modernize the system before 2030 to effectively accommodate local generation, including wind. The cost of these generation technologies may no longer require the previous level of public incentives to become major market forces. However, in the next ten years, we must make the transmission and other electrical infrastructure completely ready to allow full deployment.

**Specific timelines, public oversight and tracking processes** should be included in every part of the Plan to assure that Massachusetts is on the path to a sustainable future.

The climate crisis demands rapid and ambitious action. We applaud your leadership on promoting clean energy and the many Massachusetts and regional programs to reduce greenhouse gas emissions. This plan can show the nation what climate leadership really looks like.

Sincerely,  
Sarah Simon, Chapter Director  
E2 - New England

cc: Hong-Hanh Chu, Program Manager, GWSA Implementation  
Claire Miziolek, Decarbonization Roadmap Study Manager





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Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
March 22, 2021

RE: EOEEA – Draft Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides:

The Nature Conservancy thanks the Baker/Polito administration for its leadership on climate change mitigation, adaptation, and resiliency. We appreciate the opportunity to comment on the Executive Office of Energy and Environmental Affairs’ (EEA) Draft Interim Clean Energy and Climate Plan for 2030 (CECP).

Founded in 1951, The Nature Conservancy (The Conservancy) is a global environmental nonprofit working to create a world where people and nature can thrive. We have over 34,000 members in Massachusetts supporting our mission to protect the lands and waters on which all life depends. The Conservancy is committed to tackling climate change and to helping vulnerable people and places adapt to the impacts of a changing climate. We are doing this by working to reduce fossil fuel emissions, using the power of nature to remove carbon emissions already in the air, and helping people and nature become more resilient to the impacts we are already experiencing.

Since its establishment in 2012, the Conservancy has appreciated our appointment to a seat on the Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC). We are grateful for the opportunity to chair the Land Use and Nature-Based Solutions Work Group (NBS Work Group) and to provide input on the CECP.

The Conservancy believes the CECP is essential to providing a clear path to a people-centered approach to tackling the climate crisis and decarbonizing our way of life during the critical next ten years. We appreciate the Baker/Polito administration’s continued leadership in setting a strong 2030 gross emissions goal, and then doing the even more challenging work of laying out an ambitious but feasible plan to reach that goal across all sectors of the Commonwealth’s economy. The Conservancy offers these comments with great respect for the EEA staff who have toiled, despite the pandemic, to collaborate with stakeholders, manage consultants, and prepare the Decarbonization Road Map, technical analyses, and the CECP.

### **Overarching Recommendations for the CECP:**

#### **1. Strengthen focus on climate justice**

We strongly support the policy recommendations to reduce emissions and mitigate climate change that were developed by the five IAC Work Groups—Electricity, Transportation,

Buildings, Land Use and Nature-Based Solutions, and Climate Justice—and approved by the full IAC. Reaching consensus on these strategies involved considerable work by the Climate Justice Work Group to educate and collaborate with each of the other work groups and the IAC. **The IAC unanimously voted to recommend that the CECP include and prioritize climate justice.** Including these strategies as a link within a footnote of the CECP, as opposed to in the text of the document and integrated into the top strategies, is extremely problematic.

As one example of the information that was lost by not including these strategies more visibly in the CECP: although EEA highlighted the success of the Greening the Gateway Cities tree planting program in its CECP listening sessions, the CECP itself does not contain any mention of urban or rural (reforestation) tree planting, let alone a recommendation to expand the program or increase work of this nature.

## 2. Make the plan SMART(er): specific, measurable, achievable, relevant and time-bound

Each sector and related strategies should:

- Set measurable and achievable numeric goals with clearly identified metrics of success;
- Make stronger commitments to strategies (ex. rather than ‘exploring’ policies and actions, provide a clear pathway and timeframe for action);
- Be bolder by augmenting incentives with requirements and regulations;
- Develop timelines and set deadlines for actions;
- Determine the roles, responsibilities, and accountability of agencies in carrying out the plan;
- Identify existing legal authority and funding for strategies and propose new/more where needed; and
- Provide opportunities for collaboration and partnerships with NGOs.

## 3. Include cross-cutting strategies

The most efficient use of climate change policy and funding is for strategies that have more than one benefit. For example, strategies that have benefits in both the building and land sectors, or that achieve both greenhouse gas emissions and resilience goals. **We strongly recommend that the CECP include the cross-cutting actions recommended by the IAC in its memo to EEA,** whether as a stand-alone chapter or otherwise more clearly highlighted within each sector chapter.

## 4. Provide parity of urgency and numeric goals for natural and working lands

Chapter 6, which focuses on “Protecting our Natural and Working Lands,” lacks the urgency and call to action of the other chapters. This is problematic, because one of the reasons that nature is a powerful tool in addressing climate change is that its benefits compound over many years. Trees planted or wetlands restored now will yield increasing benefits each year through 2030, 2040, and beyond. Conversely, natural and working lands that are lost or degraded now have compounding impacts, with lost carbon sequestration now and each year through 2030, 2040, and beyond.

**For these reasons, the most important actions the Commonwealth can take now regarding natural and working lands are “no-regrets actions,”** such as permanently protecting forest land and avoiding the degradation of coastal wetlands. As we get closer to 2050, the more challenging and expensive the remaining emissions reductions will be, and we cannot afford to

wait until 2030 or 2040 to minimize the loss of natural and working lands and release of the carbon stored on them. If we act now, by 2030, natural climate solutions in Massachusetts can reduce and/or remove an additional 1-2 MMtCO<sub>2</sub>e (million metric tons of carbon dioxide equivalent) every year, the equivalent of taking ~215,000 to 435,000 cars off the road.<sup>1</sup>

## 5. Enhance stakeholder process

As an advisory body, the IAC has worked to inform the Administration's efforts to develop both a roadmap to achieving net zero carbon emissions by 2050 and a policy framework that will guide GWSA implementation for the next five years to a decade. We know this is challenging work, and we appreciate EEA's restructuring of the IAC and creation of Work Groups, especially the creation of the Climate Justice Work Group. We also appreciate EEA's efforts to provide presentations and public forums (and provide translation in multiple languages), especially given the disruptions to process and planning caused by COVID-19.

As EEA moves forward to either revisit the CECP under new law or to implement a final CECP, we believe EEA and the IAC should figure out a mutually beneficial process and path forward through discussion, evaluation, and joint decision-making. **In addition to working alongside the IAC, we request that EEA follow through on the NBS Work Group's recommendation to reach out to additional stakeholder groups that have relevant data and different perspectives that could have informed elements of the CECP.** In addition. Finally, we urge EEA to adopt the recommendations of the IAC, as drafted by the Climate Justice Work Group, to ensure that community engagement influences state decision-making, with environmental justice population representation on advisory committees and with consultation of the Environmental Justice Advisory Council -- all in advance of decisions.

### Sector-based recommendations:

The Conservancy has also submitted detailed comments on chapter 2, 4, and 6 through EEA's on-line portal. Given our expertise in this area, high-level comments on chapter 6 follow below.

#### CECP Chapter 6: Protecting our Natural and Working Lands

The following recommendations were submitted to EEA by the NBS Work Group in June 2020. We urge EEA to incorporate these best practices into the strategies within this chapter:

1. Monitor negative and positive emissions from the natural and working lands sector compared to a start date and a projected business as usual scenario. If the chosen start date is different than 1990 (which is the baseline year for the other sectors under the GWSA), transparency in explaining a different start date is needed.
2. Establish a numeric goal for the land sector, both for reducing positive emissions (greenhouse gas emissions from loss and management of natural and working lands), and for increasing negative emissions (increasing the carbon dioxide equivalent that is removed from the atmosphere and added to carbon stocks).

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<sup>1</sup> Natural Climate Solutions US Mapper: <https://nature4climate.org/u-s-carbon-mapper/> ; Average vehicle emissions: <https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle>

As a reminder, the IAC as a whole voted unanimously to recommend that EEA “Define and codify land use as a separate sector and set numeric goals for reducing greenhouse gas emissions and for increasing carbon sequestration measured against the 1990 baseline and business as usual projections, as in other sectors.” We should not let perfection be the enemy of the good. As EEA further develops science and analysis in this sector, we should set interim goals for acres of land protection, program spending on management and restoration, and so on, that are based on best currently available science.

3. To reach this goal, follow the implementation hierarchy – first protect, then manage, and restore natural and working lands. Protecting lands and carbon stocks does not mean stopping forestry and agriculture. It also does not mean stopping all development of natural and working lands, but rather using careful planning and low-impact development to minimize that loss wherever possible. Protection is the base of the hierarchy and the preferred action because a portion of the carbon lost when we lose natural and working lands is essentially irrecoverable carbon and cannot be regained even with intensive management or expensive restoration.
4. Consider both global (carbon) and local (water, air, biodiversity, economic) impacts of investments in strategies to protect, manage, and restore natural and working lands. Who is harmed or helped by those local impacts? Use the principles and guiding questions created by the IAC Climate Justice working group to prioritize funding for those actions that correct past environmental injustices and make historically marginalized communities more resilient to climate change.
5. Look across sectors at ways that energy affects natural and working lands, natural and working lands affect buildings, and all other cross-sector impacts. Similarly, consider both climate mitigation and adaptation when evaluating strategies, and consider prioritizing investments in policies and programs that help with both mitigation and adaptation.
6. Establish a robust public stakeholder process, including groups far broader than the IAC and its working groups, to review recommendations and policies included in the Clean Energy and Climate Plan for 2030.

#### CECP Strategy L1: Protect Natural and Working Lands

We appreciate the CECP’s ambitious goal of ‘no net loss of farms and forests,’ as well as the alignment with the Resilient Lands Initiative, of which The Conservancy was a stakeholder. In addition, this section references “land conservation and stewardship initiatives;” however, these are not elaborated upon. We believe this section would be strengthened by referencing specific opportunities to increase the pace and scale of conservation and restoration across the Commonwealth, such as by increasing the Conservation Land Tax Credit, increasing funding to existing land conservation and restoration programs, and adopting a mitigation hierarchy for development.

We also appreciate the inclusion of blue carbon systems in the CECP. Although these ecosystems cover a small amount of area, they store decades to hundreds of years of carbon in sediments; therefore, degradation or loss of blue carbon systems has an outsized impact on the Commonwealth’s carbon inventory. Currently, the CECP calls for “maintaining protections” for blue carbon systems. Unfortunately, current protections are not sufficient to prevent the

degradation and even outright loss of salt marshes and eelgrass beds. More than “maintenance” is required. We recommend revising the Massachusetts Wetlands Protection Act regulations to reduce climate change impacts by reflecting future climate change projections (sea level rise, shifting temperatures, changing precipitation projections); and revising clean water protection regulations and programs to address nutrient pollution.

Finally, we were disappointed to see reforestation and urban tree planting completely omitted from the CECP. The Conservancy completed an analysis of reforestation areas that offer water quality and other benefits, in addition to carbon benefits. These areas, primarily owned by private landowners and municipalities, provide a significant opportunity to increase our carbon storage. This natural climate solution should be clearly included in the CECP, and the Commonwealth should develop programs and funding to support it. In addition, the very successful Greening the Gateway Cities program, which has energy saving and public health co-benefits, should clearly feature in this section, with a recommendation to expand it within existing and into new communities.

### CECP Strategy L2: Manage for Ecosystem Health and Enhanced Carbon Sequestration

We appreciate the CECP’s support for the programs that incentivize farmers, forest landowners, and wetland restoration projects to store and sequester more carbon in soils and plants. The focus on the Resilient Lands Initiative goal of enrolling ~100,000 acres of land in a climate-smart forest management program by 2030 is especially appreciated, as is the commitment to act on the findings and best management practices outlined in the Healthy Soils Action Plan.

To further strengthen this section, we recommend adding a priority action to provide additional rebates, or ecosystem service payments, to landowners/managers who manage or restore lands in ways that store more carbon on the land and in usable products over the medium term (through 2050). For example, the CECP could recommend adding incentives to the chapter 61 program for landowners who implement the carbon-beneficial management practices developed by stakeholders as part of the Family Forest Carbon Program and Mohawk Trail Woodland Partnership pilot of the Forest Resilience Program. To make this program accessible to as many landowners as possible, we recommend using a fixed rate of payment for different land classes, or for each management practice, to decrease the bureaucratic load on landowners.

Finally, while we understand that EEA has determined the need for additional analyses, the CECP lacks specificity. The plan should include a clear rationale for what additional analyses of natural and working lands carbon are needed, when they will be done, and how the results of analysis will directly inform action.

### CECP Strategy L3: Incentivize Regional Manufacture and Use of Durable Wood Products

The CECP unfortunately does not account for the embodied carbon in steel and concrete within the building sector. However, we appreciate that this section of chapter 6 makes the connection between the building sector and the use of sustainably harvested wood, and the carbon benefits of substituting wood for more carbon-intensive traditional building materials.

We suggest that the CECP get much more specific than to “continue exploring opportunities” to incentivize the use of sustainably harvested wood. For example, the CECP could recommend enforcement of existing procurement policies, or expansion of those policies, to require the use

of local wood when available. EEA could use a quantitative measure of embodied carbon for all building materials for state-funded construction, similar to California’s “Buy Clean California Act”. Such a policy would set a maximum global warming potential for building materials eligible to be used in state projects, whether wood, concrete, steel, or other products. Finally, the CECP can refer to the ongoing Regional Dialogue on Incentivizing Mass Timber to Reduce Climate Change for additional recommendations for ways to incentivize the manufacture and use of wood building products in our region.

#### CECP Strategy L4: Develop Sequestration Accounting and Market Frameworks

We appreciate EEA’s commitment to first achieve deep greenhouse gas emissions reductions (gross emission reductions) across all sectors before considering ways to absorb or offset the remaining unavoidable greenhouse gas emissions. This is another reason that setting a goal for reducing emissions within/from the land use is critical, since offsets must be used as a last resort, after deep emissions reductions in all six sectors (including land).

Developing sequestration accounting and market frameworks is challenging, but many other countries and regions have already done so. We urge EEA and the Massachusetts Department of Environmental Protection to use best management practices aligned with international standards of carbon accounting and inventories, for example by considering the resources, principles, and lessons learned in the “Natural Climate Solutions Handbook” and the IPCC and other international reports listed within. This guide for countries considering natural climate solutions within their national climate commitments will be published next month at [nature4climate.org](http://nature4climate.org). Finally, as an offsets framework is developed, we urge EEA to convene a robust stakeholder process to consider offsets in the context of other emissions sources and especially to ensure representation of environmental justice communities. Without early and genuine representation, we risk creating a regional market that allows pollution in underserved communities while concentrating funding and non-carbon benefits elsewhere.

#### Conclusion:

We appreciate the opportunity to comment on the CECP and to participate in the IAC and its various work groups to move from planning to acting on the strategies identified in the CECP. The Conservancy recognizes and appreciates that moving to a net zero framework is just the latest example of the Commonwealth acting at the scale and pace needed to address the problems of climate change. The CECP and 2050 Decarbonization Roadmap are important steps in providing a clear path to decarbonize our economy and to create a world where both people and nature thrive.

Thank you for your time and consideration. Please feel free to contact me should you have any questions.

Sincerely,



Steve Long  
Director of Government Relations

## Appendix: Recommendations of the IAC Land Use and Nature Based Solutions Working Group for the Decarbonization Roadmap and the Clean Energy and Climate Plan for 2030, Submitted 9/28/2020

### **PREAMBLE**

The Land Use and Nature Based Solutions Working Group supports the work of the Massachusetts Global Warming Solutions Act Implementation Advisory Committee (IAC); and we coordinate closely with the GWSA IAC Climate Justice Working Group. We are focused on creating and improving state policies, programs and incentives that use nature to help reach the state's Net Zero goals. The Nature Conservancy is coordinating the efforts of this Working Group. Other members include Appalachian Mountain Club, the Environmental League of Massachusetts, Mass Audubon, Metropolitan Area Planning Council, and The Trustees of Reservations. Reducing greenhouse gas, especially from fossil fuels, is the most critical action we must take to mitigate climate change. However, only by harnessing the power of natural climate solutions to remove and store carbon can Massachusetts reach Net Zero greenhouse gas emissions targets. Natural climate solutions (NCS) are **actions to protect, restore, and better manage natural and working lands, such as forests, farms, and wetlands, to reduce and remove carbon emissions, with many co-benefits including resilience**. With currently available practices, Massachusetts' lands have the potential to remove and reduce **an additional 1-2 million metric tons CO<sub>2</sub>e per year**.

As we move toward net zero goals, and emissions reductions from other sectors become more challenging and expensive, NCS will become increasingly needed and important. *Nature is the only viable tool we have right now to remove carbon pollution already in the air at scale.*

To meet emissions reduction and carbon drawdown goals while making the best use of limited funding and resources, the NCS Working Group recommends that this hierarchy be followed in sequence:

- 1) **Protect** natural and working lands (NWL). Much of the carbon in these lands is irrecoverable; this carbon is emitted into the air when land is developed, and it is not possible to regain that lost carbon through management or restoration for over 30 years (the net zero timeframe).
- 2) **Manage** NWL in ways that sequester carbon in soil and plants over time. This includes monitoring agricultural and forest carbon stocks, including soil health, while ensuring steady supply of wood and food coming from Massachusetts' working lands.
- 3) **Restore** NWL when it has not been possible to protect or sustainably manage NWL. These actions include reforestation, city tree planting, restoration of wetlands, and actions to repair soil health.

For the purposes of this plan, the Land Use and Nature Based Solutions Working Group has focused on policy recommendations that are not already being implemented through state government. These recommendations are based on the full expectation that the Executive Office of Energy and Environmental Affairs will implement the recommendations of both the Healthy Soils and Resilient Lands Initiatives, and these priorities should be viewed as additive to those initiatives.

The Working Group's policy recommendations are offered with the following overall principles and guidance in mind:

Massachusetts should accurately and effectively utilize natural and working lands to achieve the benchmarks and goals in the state's Clean Energy and Climate Plan for 2030. The Commonwealth needs to take immediate and robust actions today, as investments in NWL need time and will pay enormous dividends in the future.

To effectively utilize NWL, the state should set numeric goals to:

- Reduce greenhouse gas emissions caused by the loss and poor management of NWL (emissions reductions), including the urban and suburban tree canopy; and,
- Increase the carbon dioxide that is removed from the atmosphere and stored in NWL (sequestration).

The state should establish a baseline for NWL to monitor changes in carbon emissions and removals, understand return on investment, and measure progress towards the state's carbon goals. If the chosen start date is different from 1990 (the date used in other sectors under the Global Warming Solutions Act), then state agencies should provide a transparent and comprehensive explanation for the different start date.

The state should create and maintain an annual greenhouse gas inventory of NWL emissions reductions and sequestration, including but not limited to, forests, farms, inland and coastal wetlands, and urban and suburban tree canopy. In the case of forest and agricultural products produced in Massachusetts but consumed elsewhere, and vice versa, carbon pools shall be counted, but not double-counted.

Overall, the state shall use the best available data and science when developing an annual NWL greenhouse gas inventory, numeric goal, and baseline.

The state should approach NWL strategies through a holistic lens. Strategies should consider co-benefits of investments in NWL and ways to achieve multiple objectives, including benefits of such lands to environmental justice populations, enhancing and improving climate resiliency and adaptation, protecting drinking water supplies, conserving fish and wildlife habitat, providing habitat connectivity, creating quality jobs, stimulating the economy, and creating and expanding outdoor recreational opportunities. Solely focusing policy on the carbon value of land-based resources could lead to unintended consequences and missed opportunities.

To reach the Commonwealth's climate and equity responsibilities, the state should develop partnerships, policies, programs, and funding mechanisms to protect, manage, and restore NWL. The state should incorporate the principles created by the IAC Climate Justice Working Group when forging said partnerships, policies, and programs and prioritize funding that corrects long-standing environmental injustices and makes historically marginalized communities more resilient to climate change.

Finally, in addition to meeting Massachusetts' carbon reduction goals, the inclusion of NWL is critical to meet the U.S. Climate Alliance Natural and Working Lands Challenge, and to align with international standards of carbon accounting and inventories.

The Land Use and Nature Based Solutions Working Group has identified a broad suite of actions that could be taken to activate NWL in the state's climate strategy. The following recommendations are a subset of the most urgent actions the Working Group believes the state needs to take between now and 2030 to maximize NWL contribution to the Commonwealth's climate goals.

These six recommendations have been drafted based on input on the broader list of strategies developed by the Working Group.

## **Top 6 Recommendations:**

### **Category 1: Avoid Forest Conversion**

Avoid the loss of forests in all geographies (rural, suburban and urban) by establishing new and increasing and streamlining existing grant and incentive programs for forest protection within the Executive Office of Energy and Environmental Affairs (EEA), and other state agencies, policies and programs. Programs should include priority set-asides for 1) conserving land near Environmental Justice (EJ) communities and water supply lands; 2)



maintaining mature urban tree canopy; and 3) conserving large, interconnected forests (which contain the highest carbon). To further protect forests in all geographies, add tree removal as a mandatory threshold under Massachusetts Environmental Policy Act for an Environmental Impact Review, for trees of a size to be determined by geography. Measure the carbon loss from deforestation as well as urban tree loss in greenhouse gas inventories.

### **Category 2: Restoration and protection of wetland systems' greenhouse gas sequestration and services (Blue Carbon)**

Protect, manage, and restore inland and coastal wetland systems and their carbon flux by establishing new and strengthening existing regulations and guidance and compliance and enforcement that maximize ecosystems vitality, carbon capture and other ecosystem services and expanding wetlands and stream restoration programs 1) to reduce climate change impacts by reflecting future climate change projections (sea level rise, shifting temperatures, changing precipitation projections) under the Massachusetts Wetlands Protection Act and regulations; and, 2) to prevent water quality degradation from pollution, especially in nutrient sensitive areas with combined sewer systems, Total Maximum Daily Loads for nutrient pollution, septic systems, and stormwater MS4 permits.

### **Category 3: City trees and Reforestation**

Retain existing city trees and set targets for planting new trees and for survival of planted trees in Environmental Justice communities, all 26 Gateway Cities and other urban centers. Prioritize the siting of trees where they will reduce heat island effects and lower the heating and cooling energy needs of nearby buildings and to absorb stormwater. Collect additional data on urban trees, where losses occur, and the types of development that are associated with loss. In suburban and rural areas, expand programs to reforest riparian and flood-prone areas (for example, by matching USDA Natural Resources Conservation Service cost-share funding).

### **Category 4: Net Gain of Ecosystem Functions/Services**

Enact legislation to achieve a Net Gain of ecosystem functions/services (TBD), and the ability for natural resources to provide clean air and water, carbon sequestration, adaptation benefits, etc. The law should require that EEA 1) set a Net Gain goal; 2) measure and report land use conversion and trends, including trends in Environmental Justice communities that impact urban tree canopy cover; 3) create a spatial decision support tool to calculate net losses and gains, to quantify impacts and benefits, and to guide decision-making at all scales and across land use types; 4) provide incentives for protection and restoration; and, 5) promulgate regulatory requirements to avoid, minimize, and mitigate land use conversion.

### **Category 5: Increase carbon on working lands**

Increase carbon stored on working lands and increase the quality of forest and agricultural products by employing a range of strategies including using grants and state and local incentives to: 1) pay and incentivize forest landowners to practice carbon-beneficial forestry practices (through existing programs, like the Family Forest Carbon Program and by creating new forest resilience programs); and, 2) pay and incentivize farmers to apply silvopasture, cover crops, no till, and the best management practices described in the Healthy Soils Action Plan.

### **Category 6: Operationalize nature-based solutions for new and redevelopment.**

Create incentives for reforming local ordinances, bylaws, and permitting processes to ensure no net loss of ecosystem services through protection and maximization of green infrastructure/nature-based solutions in all

new and redevelopment and combine gray/green infrastructure where needed. Some examples include Open Space Residential Design, Natural Resource Protection Zoning by right, Transfer of Development Rights, green infrastructure and natural climate solutions design requirements in subdivision regulations and site plan review, and tree retention ordinances with unavoidable tree removals requiring payments into a local fund for tree planting. Make adoption of these rules a requirement for continued qualification as a Municipal Vulnerability Preparedness community, Green Community, other existing grant programs, and create new state incentives for communities to adopt these rules and to incorporate these principles into municipal projects.



Via Electronic Mail and [Online Portal](#)

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
[gwsa@mass.gov](mailto:gwsa@mass.gov)

**Subject: Sierra Club Massachusetts Chapter Comments on the 2030 Clean Energy and Climate Plan**

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

On behalf of the 100,000 members and supporters of the Sierra Club's Massachusetts Chapter, we are grateful for the opportunity to provide recommendations to improve the 2030 Interim Clean Energy and Climate Plan (the Interim CECP). We hope these comments will help EEA with the finalization of the 2030 CECP.

The finalized 2030 CECP must more quickly frontload the decarbonization of our economy so that we reduce our emissions sooner. The CECP must also better define the actions, dates and resources needed to remove the barriers to achieve the state's 2030 emissions reductions goals. Our recommendations to improve the Interim CECP are organized into the following 6 sections:

- **Overall** comments
- **Cross sector** comments
- **Transportation** comments
- **Buildings** comments
- **Energy** comments
- **Natural lands** comments

**OVERALL COMMENTS**

We encourage EEA to strengthen the CECP by:

- Defining the obligations of the state legislature and timeline for those actions.
- Clarifying the federal actions critical to the implementation of the plan.
- Specifying necessary local and municipal actions including timelines.
- Identifying the resources necessary to implement this plan.



- Making the strategy goals of the plan measurable on an annual basis.
- Identifying contingency options in the face of possible setbacks.

**Define the obligations of the state legislature.** “*The Massachusetts Legislature has and will continue to play a critical role*” (page 9), but the Interim CECP does not identify necessary legislative actions.<sup>1</sup>

We need a master plan for all of state government that identifies actions and requirements beyond EEA and related agencies. The 2030 CECP should identify:

- Needs to update the statutory authority and mission statements of several agencies such as DPU, EFSB, DOER, BBRS and others
- Needs for funding that are likely to require legislative action.

**Clarify the federal actions critical to the implementation of the plan.** “*Continued engagement with, and action by, the federal government is ... critical*” (page 9). The table on page 10 should identify which federal actions, such as actions by FERC, are critical and the provisions and timeframes of those actions necessary to the plan. For instance, if we need Federal action in order to achieve electrification goals, those should be spelled out.

**Clarify the obligations of cities and towns.** “*Continued action by local government ... is required.*” (page 9) Achievement of the plan requires “*action at all levels of government*”. The 2030 CECP should be a master plan that provides a centralized statement of necessary municipal and/or local actions and timelines to guide municipalities in their climate planning objectives and activities.

**Identify resources needed to achieve the plan.** The transition to a clean economy is beneficial on many levels. It will build a more healthy and equitable society, while growing our state’s middle class. It creates an opportunity to build a nation leading sustainable state economy. The CECP should identify the resources we need in the next decade (and when) to ensure that we invest appropriately to meet or exceed the targets necessary to make Massachusetts a leader in the burgeoning international green economy.

**Make the plan measurable.** The majority of the Interim CECP’s identified Strategy Actions are not measurable:

- At least 23 of the 55 Strategy Actions do not commit to results or to actions. They are expressed with verbs such as “will explore”, “will seek”, “will work to develop”
- The Interim CECP lacks dates and milestones for the promulgation of the majority of identified Strategy Actions.

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<sup>1</sup> The only mention of legislative action is on page 43: “*EEA will work with DPU, DOER, the Office of the Attorney General, and the Legislature to ensure the Interim Planning, development, and cost-benefit analysis for the Massachusetts distribution system are designed ... to achieve Net Zero in 2050*”



To make the plan measurable, it should require an annual progress report with tracked specific metrics for all Strategy Actions. Such metrics could include: the number of new EVs on the road; the number of EV's registered to residents of EJ communities; the level of increased ridership on public transit; the reduction in vehicle miles traveled (VMT) by light passenger vehicles; the number of government fleet vehicles which are electrified; the number of miles of new bike and bus lanes; the number of heat pumps deployed; the percentage of whole home retrofits in rental units, ej communities, low and moderate income households, and small businesses; the number and demographics of graduates of workforce training programs; the levels of methane, particulate matter and other pollution in the air in environmental justice communities; the number of MW of solar projects built near load centers on impervious or brownfield surfaces; and the number of new net zero buildings constructed; etc.

**Identify contingency options in the face of possible setbacks.** As the Covid-19 pandemic has shown, reality can deviate greatly from planning. What additional options are there if EV adoption rates remain low? What additional options are there if heating system replacements continue to be largely fossil fuel replacements? What are the alternatives if relying on stock turnover dates does not yield sufficient activity?

## **CROSS SECTOR COMMENTS**

There are several fundamental considerations that need to be incorporated across the 2030 CECP:

- **Prioritize low income and EJ communities to benefit first and most**
- **Adjust Strategy Actions to accelerate near term emissions reductions.**
- **Recognize the real costs and benefits.**
- **Do not allow actions that are contrary to the net zero 2050 goal**

**Prioritize low income and EJ communities to benefit first and most from the plan.** Transitioning our economy to a renewable energy economy must happen as quickly as possible. Without support, moderate income, low income, and poor populations will find it near impossible to make this transition because of cost. These same communities often bear the brunt of decades of dirty fossil fuel infrastructure and little investment by the state in housing, health or resilience. The plan to get to netzero emissions simply will not work without prioritizing state programs to invest in and benefit immediately and first those who can least afford these technologies.

Without such prioritization, and the metrics by which to measure and ensure program efficacy, these populations will be left behind in the transition, subject to the spiraling costs of maintaining outdated fossil fuel technologies in their homes and vehicles.

**Adjust Strategy Actions to accelerate near term emissions reductions.** It's a mistake to think that the 2030 limit doesn't matter for climate impacts as long as the 2050 emissions are the same.



The climate impacts of greenhouse gases (GHG) are a function of both how long those gases have been in the atmosphere and the composition of those emissions. A reduction 30 years from now has much less impact over time than that same reduction being made this year.

In the building sector, as written on p. 54 of the [Massachusetts 2050 Decarbonization Roadmap](#): The adoption of a high-performance (the equivalent of Net Zero or Passive House) new construction code would reduce annual 2050 emissions from residential and commercial new construction by 0.8 MMT CO<sub>2</sub> (54% reduction) if implemented in 2030 and by 1.30 MMT CO<sub>2</sub> (87% reduction) if implemented in 2023. Total emissions saved over 30 years reach 22 MMT CO<sub>2</sub> by 2050 if this code is implemented in 2023 and 10 MMT CO<sub>2</sub> if implemented in 2030.

The emissions reductions achieved today dramatically reduces the total amount of GHG the Commonwealth will have emitted at the 2050 milestone date. For instance, by following the draft CECP path that reduces emissions 45% by 2030 and 65% by 2040, the total emissions would be approximately 1,237 MMTCO<sub>2</sub>e from 2021 through 2050. In contrast, by following the Climate Bill's faster path with 50% by 2030 and 75% by 2040, the total emissions would be about 13% LESS on a cumulative basis: approximately 1,087 MMTCO<sub>2</sub>e over the same 30-year period. The difference in these two paths represents more than 2 years of statewide emissions, even though both paths achieve the same percentage reductions in 2050.

The remaining global carbon budget to limit warming to 1.5°C with a probability of 67% is roughly 420,000 MMTCO<sub>2</sub>e starting in 2018. **Based on population as one basis for allocation, the share for the state of MA is about 375 MMTCO<sub>2</sub>e, which would be exhausted during 2023 at our current rate of emissions.** The carbon budget is essentially just a different way to quantify the urgency of climate action, that is, it should be used to supplement the GWSA metric of percent reduction by particular years. A fair reading of the science should tell us that 2050 is too late to reach net zero, and 50% is too small a reduction by 2030.

The 50% target attributed to the IPCC 1.5 Degrees Report was a global figure and a floor— clearly not a credible basis for setting a 2030 emission limit in a developed country in a state that wants to be a leader. We should be more aggressive than the world average because Massachusetts:

- Is wealthier than most regions of the world: [we have the highest GDP per capita of any US state](#)
- Is responsible for substantial cumulative historical GHG emissions
- Has less hard-to-abate industry, e.g., steel and cement
- Is resourced with ample offshore wind
- Has a better education system than other regions so it will be easier to educate energy consumers and to train and retrain workers.

**Recognize the real costs and benefits.** The interim CECP attempts to minimize costs in buildings and transportation by relying on end-of-service dates as the transition points. The underlying cost model,



based only on immediate direct costs, is invalid because it ignores the external costs such as health impacts and quality of life impacts of inaction from the continued reliance on fossil fuels. Furthermore, it overlooks the direct cost benefits of lower utility bills and operating costs to residents and consumers associated with electrification. The sooner our citizens begin to receive these benefits the better. Assumptions about retiring old assets should be based on community, financial, and health benefits and not simply traditional asset lifetimes.

**Do not incentivize emissions reducing strategies in this decade that will make it more difficult to reach netzero by 2050.** An example of this risk is providing incentives for new gas furnaces with a useful life measured in decades. Such incentives should be eliminated immediately, as in the MassSave 3-Year Energy Efficiency Plan for 2022-2024.

**The guiding principle in the CECP needs to be the rapid elimination of fossil fuels in our energy systems,** not new or altered ways of using them through incentives, enhancement of fossil fuel infrastructure or fuel blending. Continued or altered use of the gas infrastructure is:

- *Contrary to the net zero by 2050 goal.* We cannot combust our way to lower emissions in the short timeframe.
- *A safety and financial threat to the public.* A series of high profile natural gas accidents over the past decade (Merrimack Valley, San Bruno, New York City, various places in Pennsylvania) combined with an antiquated pipeline distribution network requires consideration of the potential financial and human consequences of another major pipeline accident. The cost of rebuilding the entire gas system would be astronomical. However, anything short of a complete rebuild of the system poses an unacceptably high accident risk. If San Bruno had happened in Massachusetts, the cost to ratepayers would have been severe. Pumped hydrogen into a pipeline system will further raise safety risks. Depending on the magnitude, a single gas pipeline gas accident could cost the Commonwealth more than a decade of sustained high levels of investment in clean energy.
- *An ever increasing cost problem.* In the pipeline gas pathway, average gas rates increased by 2-3 times due to a combination of biogas cost, operation of a large system with fewer customers, lower gas pipeline throughput, and impacts of the marginal cost to abate carbon emissions elsewhere in the economy required to allow the continued combustion of natural gas in buildings.

## **TRANSPORTATION**

To reduce emissions from the transportation sector-- the largest source of emissions in the Commonwealth-- it is critical that the transportation Strategy Actions include measurable goals rather than the current “exploring’ and ‘investigating’ of program ideas. The Administration’s Future of Transportation Commission Report identified many strategies that will equitably lower emissions in this



sector. Implementation of these strategies must be swift, with identified funding sources, and annually tracked metrics. We offer the following transportation sector recommendations.

**Add a Strategy Action to Expand Public Transit and Active Transportation Options Statewide.**

We are alarmed at the plan’s glaring omission of expanding transit as a strategy to encourage mode shift and reduce emissions, congestion, and vehicle miles travelled. For many, public transit is a lifeline to economic opportunity and is often the only means to get around. The 2030 CECP should include a new strategy action focused on public transit and active transportation options. In addition to public health co-benefits, improvements and modernization of our transit system and active mobility options like biking and walking is critical to supporting a mode shift from single occupancy vehicles. The 2030 CECP should include a commitment to:

- Full bus fleet electrification at the Massachusetts Bay Transportation Authority (MBTA) by 2030 and prioritize electric bus operations on routes serving EJ populations that currently host polluting fossil fuel buses. To support an all-electric fleet, the MBTA should expedite and complete the planning, design, and construction of new bus maintenance facilities by 2030.
- Full bus fleet electrification at Regional Transit Authority’s (RTA) by 2035.
- Electrify the commuter rail system by 2035 and prioritize electrification of the Fairmount Line, Providence, and Newburyport/Rockport line by 2024. This will not only reduce carbon impacts but also reduce travel time which should encourage mode shift.
- Electrify state and municipal fleets by 2035 prioritizing the transition in air pollution hot spots across the state.
- Increase access to public transit for environmental justice (EJ) populations by adopting low-income transit fares.
- Increase performance and destinations reachable by public transit across the state. For rail, this means projects such as North-South Rail Link, MBTA commuter rail to the Cape, East-West Rail via Springfield and Northern tier, Housatonic service. This will advance regional equity, serve gateway cities, and provide jobs. Level boarding should be standard which also increases adoption (reduce VMT) especially for populations with limited mobility. All commuter rail lines should be double-tracked at a minimum (or more where needed such as the Worcester line).

**Strategy T1:Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions**

**1. Establish the Transportation and Climate Initiative Program (TCI-P) Equity Advisory Board by Summer 2021 and Start Equity Work Before 2023**

We strongly urge you to create a “strategy action” to **begin TCI-P equity work immediately** and not wait till 2023 to implement complementary policies like low-income fare programs, air monitoring stations, and congestion pricing. The Commonwealth should complete the process to establish an Equity Advisory Board (EAB) by summer of 2021 with a majority of appointed members representing overburdened and underserved communities. Massachusetts should create a detailed plan for public engagement and decision making process on how TCI-P revenue will be





spent and indicate investment targets for transit, walking, and biking infrastructure. In addition, the 2030 CECP should commit to increasing investment of TCI-P proceeds in EJ communities from 35% to at least 70%.

**2. Provide more specificity about the Low Carbon Fuel Standard**

The 2030 CECP should provide more details on biofuels that would qualify under the Low Carbon Fuel Standard (LCFS). For instance, will LCFS include conventional or advanced biofuels? What measures will be put in place to ensure that this program does not divert agricultural land for the production of biofuels or impact low-income residents at the pump? We recommend that the Commonwealth commit to an early and meaningful public engagement process, specifically with environmental justice populations, many of whom might be directly impacted by air pollution caused by the creation, storage and transportation of biofuels. Equity recommendations and findings from engagement should influence and be incorporated into policy design right at the outset.

**Strategy T2: : Implement Coordinated Advanced Clean Vehicle Emissions and Sales Standards**

**1. Adopt the higher sales targets of the Advanced Clean Truck (ACT) Rule for the medium-and heavy-duty vehicle sector, begin rulemaking and public engagement process**

We support the decision to adopt California’s Advanced Clean Car Standard, Advanced Clean Truck (ACT) Rule, and Advanced Clean Fleets Rule. However, California needs a waiver from the EPA before the Advanced Clean Truck rule can come into effect and be adopted by Massachusetts. Further, California is expected to finalize regulations for the Clean Car Standard II in 2022 and the policy comes into effect only in 2026. Instead of waiting for later in the decade to take action, it is crucial that Massachusetts immediately develop and implement policies and programs to accelerate EV adoption and begin the rulemaking process as soon as California undertakes the waiver request.

As the Commonwealth has committed to both the multi-state medium-and heavy-duty zero emission vehicles MOU and the ACT Rule we urge Massachusetts to adopt higher sales targets of the ACT Rule and commit to 50% of sales being electric by 2030 and 100% zero-emission sales by 2045, which is five years faster than the goal of 100% by 2050 in the MOU.

**Strategy T3: Reduce Upfront ZEV Purchase Cost Burden**

**1. Commit to MOR-EV rebates at point of purchase and implement a rebate program for moderate-and low-income residents**

We commend the Commonwealth’s goal for all new light-duty vehicle sales to be 100% electric by 2035 and to deploy 750,000 to one million electric vehicles in the next decade. To reach this goal, rebates to lower the higher upfront costs of electric vehicles are an important tool to



accelerate adoption levels and make EVs accessible to more residents. The Commonwealth should commit to offering the MOR-EV rebate at the point of purchase by 2021 and implement a new and used EV rebate program for moderate and low-income residents by 2022. In addition, the MassEVIP subsidies<sup>2</sup> municipal and state agencies should be paired with a group purchasing program to further lower electric vehicle procurement costs for light-duty fleets and be implemented by 2021.

**2. Prioritize electrification of the medium-and heavy-duty vehicle sector in this decade and commit to electrification of transit and school buses**

We are glad that the MOR-EV program was recently expanded to include a rebate for medium-and heavy-duty vehicles. However, the interim 2030 CECP does not reflect actions to reduce emissions from this sector. We recommend that the 2030 CECP include policy strategies and programs to reduce emission from the medium-and heavy-duty vehicle sector in this decade instead of delaying this important action. As the medium-and heavy-duty vehicle MOU already commits Massachusetts to a minimum of 30% of new sales being electric by 2030, a good starting point is for the state to accelerate the electrification of transit and school buses to help reach that goal. Electric transit and school bus technology is now mainstream and can be on the road in the near term while model availability for other medium-and heavy-duty vehicles continues to develop.

**Strategy T4: Deploy Electric Vehicle Supply Equipment and Enable Smart Charging**

**1. Accelerate Deployment of Charging Infrastructure and Implement Alternative Utility Rate Structures**

Easy access to charging stations is critical to the widespread adoption of electric vehicles. The 2030 CECP should identify and set a numeric target for the number of charging stations needed in the next decade to meet our zero emission vehicle goals. Massachusetts should not explore but **commit to** analyzing alternative utility rate structure and addressing barriers to improve DCFC financial viability in 2021 and implementing time-varying rates and residential charging incentive programs by the summer of 2022 to encourage off-peak charging and maximize consumer participation.

**Strategy T5: Engage Consumers & Facilitate Markets**

**1. Provide Details of Market Facilitation Programs Beyond 2021 and Report Progress Annually**

We support the MassCEC pilot programs focused on medium-and heavy-duty (MDHD) fleet electrification, MDHD depot make-ready program, and workforce development by the end of

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<sup>2</sup> MassEVIP Workplace and Fleet Charging Incentives, <https://www.mass.gov/how-to/apply-for-massevip-workplace-fleet-charging-incentives>



2021. The 2030 CECP should include details of proposed policy actions beyond 2021. In addition to ongoing programs like MassEVOlve that will help raise consumer awareness and education, Massachusetts should implement policies like EV access to HOV lanes, preferential parking locations, and reduced parking fees. The EEA should provide an annual report on the strategy actions and programs undertaken to expand market development and raise consumer awareness.

### **Strategy T6: Stabilize Light Duty VMT and Promote Alternative Transportation Modes**

#### **1. Reduce not Stabilize Light Duty Vehicle Miles Traveled (VMT), Expand Transit, and Implement Smart Growth Policies**

The 2030 CECP should commit to reducing and not just stabilizing VMT. An accessible, reliable, and expanded transit system combined with ‘Smart Growth’ policies like affordable, mixed-use development near transit is central to promoting mode shift and reducing VMT. This also has several co-benefits including reducing traffic congestion and carbon emissions, improving public health outcomes, expanding access to economic opportunity for those without personal vehicles, and land preservation.

Further, a robust, affordable transit system together with compact growth near transit, and safe biking and walking infrastructure can provide alternatives to car travel and reduce car ownership. Depending on electrification and telecommunication alone without a commitment to maintaining and expanding transit and active transportation options will not result in substantial VMT reduction and would exacerbate inequities.

## **BUILDINGS**

Reducing emissions from the building sector is a challenge that needs to be met with significant initiatives. We strongly urge the adoption of the following:

### **Strategy B1: Avoid Construction of Building Systems That Are Not 2050-Compliant**

- 1. Establish a non combustion netzero opt-in stretch code in 2022** with statewide adoption as a base code in 2025. As noted in the Roadmap technical analysis quoted above, early adoption yields significant savings in CO<sub>2</sub>e emissions by 2050; and [netzero construction costs have reached parity with conventional buildings in Massachusetts](#). New wholly electrified buildings will save the Commonwealth the costs of electrification retrofits that must be in place by 2050.
- 2. Strengthen the current stretch energy code in 2021** to improve efficiency and building performance for those Green Communities who don’t opt in to the 2022 netzero stretch code.
- 3. Add equity standards to the State Building Code.** Project developers must take into account existing pollution in a community and require ethical sourcing of building materials. They must provide a living wage and safe job conditions for construction workers; ensure that buildings comply with accessibility best practices; and maximize the health benefits of efficiency upgrades.



## **Strategies B2 & B3: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems and Cap Heating Fuel Emissions**

- 1. Set mandatory GHG emissions reduction limits on the building sector** statewide by 2022 with enforcement starting by 2023 via the proposed heating fuel emissions cap on CO<sub>2</sub>e from heating fuel suppliers, with declining cap levels over time, and investment in comprehensive whole home retrofits for low and moderate income households and small businesses that include health and safety repairs, weatherization, and electrification. *Concurrently with the cap, EEA must take aggressive action with other policies, to ensure that the cap drives carbon reductions primarily through electrification and a swift phase-out of fossil fuel combustion in buildings, rather than through biofuel blending.*
- 2. Establish a comprehensive health and safety repairs, weatherization and building electrification program, through MassSave and/or Income Eligible Programs.** Prioritize low and moderate-income residents, renters, non-English speakers, with rigorous increasing of mandatory enrollment levels, and set clear policy directives by the end of 2022 to lower barriers to electrification for these populations. This program should include policies which disallow displacement and gentrification, with annual metrics to ensure that current residents are not displaced from improved housing.
- 3. Collect data on building performance in EJ communities and couple this with strict building code enforcement** particularly in low-income rental units whose tenants may not be able to effectively seek enforcement of health and safety requirements. This program should include policies which disallow displacement and gentrification, with annual metrics to ensure that current residents are not displaced from improved housing.
- 4. Set strict standards for both energy efficiency and indoor air quality and work to enforce these standards,** particularly in low-income communities and communities of color living in aging housing stock, in public housing facilities, attending public schools located in EJ populations, and in prisons.
- 5. Target outreach to EJ populations** where there is low uptake of energy efficiency benefits to inform residents about the economic benefits of weatherization and the availability of income adjusted programs.
- 6. Set mandatory annual targets in Mass Save for enrollment of low- and moderate-income** ratepayers, renters, small businesses, those with limited English proficiency, EJ communities and schools predominantly serving Black and Brown populations.
- 7. Create workforce development and training programs** with labor partners. These programs should include training for members of historically marginalized, rural, and environmental justice communities to ensure good paying jobs and a knowledgeable workforce for the building sector throughout the Commonwealth.



8. **Align MassSave with decarbonization goals** by removing all incentives by 2022 for fossil fuel appliances, including gas furnaces and stoves, and providing incentives to turn over fossil fuel appliances before end of life.
9. **Working with labor unions, create HVAC workforce training and development programs** to ensure a knowledgeable and trained workforce for the installation and operation of electric space and water heating systems. These training programs should include workforce from environmental justice, low income, and rural communities.
10. **Direct DPU to develop, with meaningful stakeholder input, a comprehensive and equitable methane gas transition plan** as required by Docket 20-80.
11. **Establish a large-scale statewide financing and investment program or climate bank** to pay for the transition:
  - a. Identify and include ample funding support for, but not limited to, deep energy retrofits (building on models of Energiesprong and RetrofitNY), equitable workforce development, local and district-scale projects, renewable energy generation, and projects that advance both GHG reductions and climate adaptation or resilience.
  - b. Identify funding for renewable energy infrastructure and microgrid technologies built close to load to add resiliency to communities across the Commonwealth.
  - c. Require that barriers to building decarbonization be removed in other state funding/financing programs, such as the Community Preservation Act (CPA) and Massachusetts School Building Authority (MSBA), as well as MassSave.

## **ENERGY SUPPLY**

A clean electricity and energy supply is an essential element of decarbonizing other sectors and thus is essential to reaching net zero.

### **Strategy E1: Develop a Mature Offshore Wind Industry in Massachusetts**

1. **Place the base target of OSW procurements at 6,000 MW by 2030.** This will ensure a market for the development of a mature OSW industry in the next decade.

### **Strategy E2: Develop and Coordinate Regional Planning and Markets**

1. **Ensure that the markets, transmission planning, and governance reform processes at ISO New England are transparent and support the participating states' energy justice and decarbonization goals.**
2. **While participating in the regional markets planning, continue immediate procurements of offshore wind, and facilitate the interconnection to scale up solar and storage deployment.**



### **Strategy E3: Align Attribute Markets with GWSA Compliance**

- 1. By 2022, remove clean energy incentives for biomass, solid waste combustion ("waste-to-energy") and any fossil fuels or carbon emitting generation.**
  - a. Effective for all EEA programs, including the RPS, APS, CES, and CPS.
  - b. By 2028, EEA should conduct a strategic review of the impact of clean energy incentive programs on the Commonwealth's ability to meet the 2050 net zero requirement; to guide further adjustments to program eligibility.
- 2. Revise 310 CMR 7.75 to reach 100% electricity from non-emitting sources by 2035. Revise 310 CMR 7.74 to stop further procurements from large Canadian hydropower.**
- 3. Address the localized public health impacts of other air pollutants (PM2.5, ozone, NOx, etc.) that co-occur with GHG emissions from combustion.**
  - a. Conduct consistent and annual reviews of the location of GHG emissions tracked under MA's carbon accounting system for the electric sector.
  - b. Use said reviews to compare impacts in EJ communities relative to non-EJ communities to inform policy implementation.
- 4. Adopt a definition of the Social Cost of Carbon that accounts for the impact that CO2e has on agriculture, public health, and property damage.**
- 5. Require electric distribution companies to solicit input from community based organizations about programs and rate design.**
- 6. Work with the legislature to include MLPs in GWSA targets and incorporate climate justice in MLP decision making.**
- 7. Reject regressive rates and tariffs that disproportionately burden EJ and low income residents.**
- 8. By 2022 EEA should conduct a comprehensive assessment of the resilience of the electric transmission and distribution system in extreme heating demand conditions:**
  - a. Assuming high electrification and advanced utilization of active demand management.
  - b. EEA should then sequence the upgrades and enabling technology needed to meet those assumptions and begin implementation of those changes by 2023.
  - c. As part of implementation, the DPU should ensure that low and moderate-income customers are able to benefit from grid modernization and do not see their energy costs rise as a result of any necessary capital investments.
- 9. EEA to support EJ populations in accessing the benefits of renewable energy generation**
  - a. **Require that grid modernization projects prioritize low- and moderate-income customers first.**
  - b. **Bolster existing customer-facing programs like the MA Solar Loan and Heat Smart to better service EJ populations.** Remove financial barriers to access by mandating that a minimum percentage of participants in customer-facing clean energy programs are from environmental justice communities and low and moderate-income electric customer categories.



- c. **Create and enhance incentives and regulatory carve-outs to encourage development of community shared distributed energy resources, microgrids, and renewable energy cooperatives in environmental justice communities.**

#### **Strategy E4: Continue to Deploy Solar in Massachusetts**

1. **Scale up solar deployments in Massachusetts with a goal of 9000 MW by 2030 concentrated primarily near load centers and on impervious surfaces.**
2. **Create targeted incentive programs for local renewable electricity for low and moderate-income, energy burdened residents, and residents of EJ communities.**
3. **EJ communities should receive at least 50% of statewide clean energy investments at no cost.**
4. **Include municipalities, EJ communities, and the solar production and installation industry along with the electric utilities (including MLPs) in carrying out the E4 Strategy Actions, particularly:**
  - a. Supporting the integration of distributed energy resources and reducing barriers from the interconnection process.
  - b. Planning for solar development to ensure best land management and conservation practices - identifying market mechanisms to incentivize brownfield and impervious surface siting.

### **NATURAL AND WORKING LANDS**

#### **Strategy L1: Protect Natural and Working Lands**

1. **Allocate a minimum percent of conservation funds and technical assistance resources for forests and wetlands that are located in close proximity to EJ populations or around water supplies for those populations**
2. **Create and maintain “blue carbon” job training opportunities for residents of EJ populations.**
3. **Set annual targets for planting new trees in urban communities**
4. **Add criteria for climate adaptation and resilience projects that create public health benefits in EJ populations**
5. **Set a deadline for shutting down polluting sites that operate in and adjacent to wetlands, such as the Saugus Wheelabrator facility.**
6. **Allocate a specific portion of state funds for ecological restoration and rewilding of forests, wetlands, rivers and other ecosystems in EJ populations or around water supplies for those populations to add ecosystem services as well as increase public access and open space in underserved EJ neighborhoods.**



## **SUMMARY**

We commend EEA for the strategies included in the Interim 2030 CECP however, the finalized 2030 CECP must be stronger. We hope to work with EEA to implement a forceful master plan for the Commonwealth that will identify the responsibilities of all elements of government, discern necessary resources, and mandate concrete, measurable actions and target dates. Together, we can plan a just transition to a renewable energy economy which will bring health, safety, and economic benefits to people and businesses across the state.

Yours Sincerely,

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Via Electronic Mail and [Online Portal](#)

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
[gwsa@mass.gov](mailto:gwsa@mass.gov)

Subject: Joint Comments on the 2030 Clean Energy and Climate Plan to Ensure  
Inclusion of Climate Justice

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

We write on behalf of 26 organizations to thank the Executive Office of Energy and Environmental Affairs for its hard work on the Roadmap Report and 2030 Interim Clean Energy and Climate Plan (“interim CECP”) and to offer the following recommendations to better integrate climate justice into the final plan (“2030 CECP”). EEA has the opportunity and responsibility to integrate more precise language into the 2030 CECP that provides details about actions that will advance climate justice. Climate justice focuses on the root causes of climate change — human-made greenhouse gas emissions (“GHG”) and related pollution — and making systemic changes that are required to address unequal burdens to our communities and realign our energy systems and economy with our natural systems. Unless justice, equity, and worker rights are central components of our equitable climate agenda in the 2030 CECP, the inequality of the carbon-based economy will be replicated in the new pollution-free economy. Below are specific recommendations, organized by chapters of the 2030 CECP.

## **I. Chapter 1 Overview**

### **A. Add Additional Policies to Commit to Equity and Justice.**

In Section 1.3 (Commitment to Equity) of the 2030 CECP, we request that EEA add the following policies:

- **Prioritize and Anchor Equity and Justice** to avoid further harm to populations most vulnerable to and most at risk from climate impacts, pollution, displacement, energy burden and cost while prioritizing climate, environmental, energy, and health benefits to such populations. Establish enforceable protections against disparate impacts. Prioritize analysis of cumulative impacts, while reducing burdens and increasing benefits to environmental justice populations.
- **Support a People-Centered Approach to Policy Making, Program Design, and Implementation**, providing for and ensuring broad-based stakeholder participation, input, and oversight. The interests of and people from populations most vulnerable to effects of climate change and most at risk of pollution,

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displacement, energy burden, and cost must be represented and influential in this process.

- **Take a Holistic Approach to Achieving Climate Goals/Net Zero by 2050/GWSA Compliance.** Recognize that EEA has an obligation to meet and/or achieve compliance with multiple laws, policies, and Executive Orders 552 and 569. Account for and accurately value co-benefits and health impacts of action, but also costs and risks associated with delay and inaction. Ensure that actions in one area do not conflict with other key goals.

The above additions to Section 1.3 will indicate that all CECP strategies should be centered in equity and justice, and that they be respectfully developed and deployed with the input, feedback, leadership, and engagement of the communities most vulnerable to the effects of climate change and most at risk from pollution, displacement, energy burden, health impacts, and other systemic inequities. Ensure that actions in one area do not conflict with other key goals.

**B. Improve Community Engagement**

Agencies should routinely engage in robust stakeholder processes to seek public input in advance of decisions. The final CECP should include, within each sector, a directive for agencies to implement a robust public engagement process. We applaud EEA for offering virtual webinars with simultaneous language interpretation and translation of written materials. EEA should use the lessons learned from convening the Roadmap and CECP webinars to ensure future meetings about climate policy also are accessible to residents who speak Spanish, Cantonese, Mandarin, Portuguese, Haitian Creole, Arabic, Amharic, Vietnamese, and additional languages other than English.

In addition to ensuring language access, the 2030 CECP should also include a commitment that community engagement will influence state decision-making. All state advisory committees should include representation from EJ populations. The Environmental Justice Advisory Council, created pursuant to state law, should be routinely convened and invited to participate in decisions about transportation, electricity, buildings, nature-based solutions, development, and housing.

**C. Support A Stringent, Science-Based Emissions Target for 2030.**

In Section 1.4 (New Goal, 45 percent in 2030), we support a stringent 2030 emissions target that will maximize the Commonwealth's ability to achieve net zero emissions by 2050. The state's GHG reduction limits must be *science-based*, meaning not just meeting the IPCC's 2030 global target of cutting emissions 45-50 percent by 2030, but also cutting *faster* than that global average to take into account our high "historical contributions to emissions," which should be

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acknowledged explicitly and quantified in the CECP along with a remaining carbon budget.<sup>1</sup> The CECP tables demonstrate that the state can get to an emissions reduction by 2030 of 45-48 percent, which is only 2 percent away from 50 percent.<sup>2</sup> Massachusetts is required to include goals in the 2030 CECP that “maximize the ability of the [C]ommonwealth to meet the 2050 emissions limit.”<sup>3</sup> The Commonwealth could meet the additional 2 percent through a variety of measures.

Further, Section 10 of *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (“Roadmap Bill”) would increase the 2030 emissions target to a 50 percent GHG reduction. We recommend that the final 2030 CECP incorporate any changes to the 2030 emissions limit based on the outcome of the Roadmap Bill and include EEA’s determination of the costs of achieving that target, accounting for the full benefits of improved public health, quality jobs, strong economy, and benefits for environmental justice (“EJ”) populations.

D. Require Diverse Hiring and Workforce Development Practices Across All Sectors to Achieve Quality Jobs.

The 2030 CECP should add a commitment for agency staff to work with an independent advisory council to oversee job creation. The jobs created through procurement, infrastructure projects, and implementation of climate policies should create a pathway out of poverty, with family-sustaining wages and benefits. The contract opportunities should incentivize domestic and local quality job creation. Funding should be allocated for programs that directly recruit, train, and retain those underrepresented in the workforce, including women, people of color, veterans, formerly incarcerated people, working class immigrants, and people living with disabilities. Training should also be provided for workers who need to learn new skills to support the just transition away from fossil fuels to clean energy.

E. Clarify Throughout the 2030 CECP Need for New Authority and Funding and Set Clear Timelines.

The 2030 CECP should indicate throughout each chapter whether EEA has existing authority or needs new statutory authority to achieve each policy recommendation/strategy action (or commit to a timeline for doing so). The interim CECP contains vague language like “consider” incentives or “explore” policies. The 2030 CECP should include requirements (i.e., regulations; eligibility criteria and/or preferential scoring for grant funding) in the appropriate policy recommendation/strategy action. We encourage EEA to integrate timelines to commence each strategy and establish target dates for policy adoption.

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<sup>1</sup> IPCC 2018 Summary for Policymakers at 9, available at: [https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15\\_SPM\\_version\\_report\\_LR.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf). See [sciencebasedtargetsnetwork.org](http://sciencebasedtargetsnetwork.org).

<sup>2</sup> “Range of GHG reductions estimated for the full and timely implementation of strategies and policy actions outlined in the 2030 CECP,” Table 1, page 13.

<sup>3</sup> M.G.L. c. 21N, § 3(b).

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The transition to a clean economy is about capital investment. The only funding sources identified in the CECP are the Transportation and Climate Initiative and the Volkswagen settlement. Additional funding will be essential to the just and equitable transition that we all desire. Low-income residents do not have the discretionary funds or credit to buy new cars, to insulate their homes, or to upgrade heating systems, or are renters with no control over building upgrades. Furthermore, the interim CECP lacks mention of how EEA and its agencies will be funded to carry out their many new tasks. It will take sustained funding to implement the 2030 CECP. We recommend clarifying in each chapter whether the relevant agency can achieve the strategy actions with existing funding and staff or whether it needs additional funding and new sources of revenue and staff.

F. Net-Zero Emissions Considerations and the Role of Bioenergy.

While the 2050 Roadmap acknowledges that net emissions impacts of different bioenergy feedstocks can vary, and appears to call for a carbon accounting approach that can distinguish these impacts, the document does not acknowledge that use of forest biomass is particularly undesirable due to its long carbon payback time. The modeling used in the Roadmap assumes a GHG emissions value of zero for biogenic fuels, including wood wastes. Such an assumption is not compatible with the science on biogenic carbon accounting and is bound to skew modeled results to a more favorable assessment of biogenic fuels than is actually justified. As the inefficiency of bioenergy is a simple function of physical qualities such as fuel energy density and moisture, there is no basis for assuming that these factors will be mitigated by improvements in technology. Massachusetts must not assume that any biogenic feedstocks are “zero emission” or “net zero.”

**II. Chapter 2: Transforming our Transportation Systems**

The transportation sector is the largest contributor of GHG emissions in the Commonwealth and it is the area in which we must make the most improvement in the next nine years.

A. Add A Specific Strategy to Address Public Transit.

The 2030 CECP has six strategies to reduce transportation sector emissions, yet none of them is focused on investments in public transportation. Pursuant to Executive Orders 579 and 580, the Commission on the Future of Transportation issued its report identifying transportation initiatives to achieve by 2040 that will both reduce GHG emissions and expand access to transportation options. The first recommended strategy in that report concludes that “investing in and expanding public transit service is critical.”<sup>4</sup> The report further goes on to add that “all buses purchased with state resources should be zero emissions by 2030.”<sup>5</sup> It would be absurd for

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<sup>4</sup> Commission on the Future of Transportation, *Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1*, at 35 (December 2018),

<https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.

<sup>5</sup> *Id.* at 54.

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the 2030 CECP to have an entire section devoted to the transportation sector that omits strategies to: (1) maintain and expand transit; and (2) electrify our buses and trains. We urge EEA to include a seventh transportation strategy that calls attention to investments in our public transit systems so that various reports and decisions from the Baker Administration are in lockstep with one another. Investing in public transportation has many co-benefits for public health beyond reducing congestion and reducing single occupancy vehicle trips.

We further recommend adding a climate justice component to the public transit strategy. To promote more equity in the transit systems and increase access to public transit for environmental justice (“EJ”) populations, the Massachusetts Bay Transportation Authority (“MBTA”) and Regional Transit Authorities (“RTAs”) should adopt low-income fares and consider free fares. Access to transit is a lifeline to many who have no other means of transportation to reach destinations, such as jobs, schools, grocery stores and healthcare facilities, safely and reliably.

**B. Add Requirement to Strategy T1 That the Administration Will Commit Much Higher Investments in Overburdened and Underserved Communities.**

Strategy T1 is focused on the Transportation and Climate Initiative Program (“TCI-P”). TCI-P needs to redress longstanding impacts of the transportation sector for EJ populations, which have been disproportionately impacted by pollution from transportation. This is specifically evident in the diesel pollution by transit buses in urban environments. Specifically, 2030 CECP should include the commitment for the Administration to develop a detailed public plan for a public engagement/decision-making process to determine how to spend TCI-P revenue, including specifying investment targets in walking, transit, and biking infrastructure. In addition, the 2030 CECP should note plans to increase the investments of TCI-P revenue in EJ communities from 35 percent to at least 70 percent and commit to appointing the equity advisory board by summer 2021.

We further recommend adding a climate justice component to Strategy T1. The 2030 CECP should commit to launching air quality monitoring programs in EJ populations that are the most overburdened by air pollution from the transportation sector in the Commonwealth by 2022. To fully account for health impacts/co-benefits of proposed policies, the Commonwealth needs to expand the air monitoring network, actively analyze air monitoring data, and consistently review environmental and energy policies to assess what is working and what needs to be tweaked to achieve air quality improvement. This will require monitoring for black carbon, ultrafine particulate matter, and nitrogen oxides, since these pollutants are commonly associated with transportation fuels. Strategy T1 should also include a commitment for the Baker Administration to incorporate the needs and experiences of overburdened and underserved communities into the TCI-P policy-making process.

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C. Add Requirement in T1 for the Commonwealth to Reduce Air Pollution in Hotspots.

In Massachusetts, expanded air monitoring for fine particulate matter (PM<sub>2.5</sub>) and ultrafine PM is necessary for the state to determine baseline conditions and track improved air quality trends. A Harvard study found that an increase in long-term air pollution exposure (1 µg/m<sup>3</sup>) leads to a COVID-19 death rate that is eight percent above the risk borne by residents of communities without such exposure.<sup>6</sup> The Commonwealth lacks sufficient baseline data to even begin to address this inequity and prevent further harm.

We recommend that the 2030 CECP require working with a broad stakeholder group that includes representatives of environmental justice organizations, academic institutions, and labor, to determine air pollution hotspots throughout the Commonwealth. Once those hotspots are determined, the Commonwealth should update its Air Quality Monitoring Network and Annual Plan to expand its monitoring network. To do so, the Massachusetts Department of Environmental Protection should establish baseline air quality conditions in 2021 and set annual targets to reduce the average air pollution for ultrafine particulates, black carbon, and nitrogen oxides in those locations. Data from the air monitors should be publicly accessible and provide near-time information. By 2022, the Commonwealth should set enforceable annual air pollution improvement targets to ensure that air pollution hotspots have significantly improved air quality by 2032. We support using funding allocated for clean transportation to support the costs associated with improving air quality in pollution hotspots. For example, funds from the Regional Greenhouse Gas Initiative, already allocated for clean transportation purposes through the MOR-EV program, could be used to expand the Commonwealth's air quality monitoring network along with other funding sources, such as TCI-P

D. Add Specificity to Strategy T1 That Addresses Biofuels.

While we support a Low Carbon Fuel Standard ("LCFS"), the 2030 CECP should specify which fuels qualify. For example, how will the Commonwealth determine which biofuels meet the LCFS? The Roadmap Report inaccurately assumes that biofuels are zero emission. If biofuels will be incorporated into the LCFS, then the 2030 CECP must acknowledge the need to maximize safety associated with the transportation of biofuels. The transportation of biofuels could occur by truck or rail, which would result in increased local air pollutants from tailpipes in communities along truck routes and near fuel blending facilities. At present, those facilities are disproportionately located in EJ populations. Moreover, biofuels, such as ethanol, are highly flammable, especially when transported in large quantities. The CECP needs to outline a plan that avoids negative impacts associated with the transportation of biofuels and eliminate potential burdens on EJ populations.

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<sup>6</sup> Wu, X., Nethery, R. C., Sabath, M. B., Braun, D. and Dominici, F., 2020. Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. *Science advances*, 6, p.eabd4049, <https://projects.iq.harvard.edu/covid-pm>.

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E. Require Public Fleet Electrification Targets for Medium- and Heavy-Duty Vehicles in Strategy T2.

Electrifying our public transit systems and school buses will result in improved air quality and will reduce the burdens associated with air pollution hotspots. We recommend that the 2030 CECP include:

- Implementing the MBTA Bus Transformation Office approved by the Fiscal and Management Control Board recommendations from November 2019 by prioritizing new electric bus procurements on routes serving EJ populations. The MBTA must begin immediate planning and design work for 100 percent electric bus facilities to meet the goal of having a 100 percent electric bus fleet by 2030. Similarly, the Regional Transit Authorities should electrify their fleets by 2035.
- Implementing the MBTA Rail Vision approved by the Fiscal and Management Control Board in November 2019 with priority electrification for the Fairmount Line, Newburyport/Rockport Line through Lynn, and Providence/Stoughton Line by 2024. Plan to electrify the remainder of the commuter rail system by 2035.
- The 2030 CECP must set targets to electrify state and municipal fleets by 2035: Fleets owned, leased, or operated by the Commonwealth or municipalities should transition to zero-emission vehicles with priority in locations that are air pollution hotspots in EJ populations.

F. Ensure that Strategy T3 Commits to Issuing Incentives at the Point of Sale.

The interim CECP notes that the Department of Energy Resources (“DOER”) “will explore providing MOR-EV rebates at point of sale in 2021” and “investigate the development of a low and moderate income (“LMI”) consumer program for ZEVs.”<sup>7</sup> We recommend that the language be revised to commit to these actions so that it reads: “the Department of Energy Resources will provide MOR-EV rebates at point of sale in 2021” and will “develop an LMI consumer program for ZEVs by 2022.” To incentivize EV adoption for larger fleets including municipalities and the Commonwealth, Massachusetts should establish a group purchasing program to lower costs for state/municipal ZEV procurements by the end of 2021.

G. Strengthen Strategy T6 by Stabilizing Light-Duty Vehicle Miles Traveled and Promote Alternative Transportation Modes.

While rapid electrification of the transportation sector is essential, without long-term investments in a robust and reliable public transit system and changes in our land use policy to support more dense, affordable, mixed-use development near transit, this transportation decarbonization strategy is incomplete. By depending almost exclusively on electrification and telecommuting, this approach runs the risk of perpetuating the inequities evident in our transportation system today.

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<sup>7</sup> Interim CECP at 22.

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As noted in the interim CECP, “the increase in VMT and vehicle size has largely offset the emissions benefit from more stringent federal fuel efficiency standards.”<sup>8</sup> To mitigate the increase in emissions associated with rising VMT, the interim CECP relies heavily on vehicle electrification. This misses an opportunity to address the problem at its source and to achieve the multitude of co-benefits associated with reducing VMT through enabling more compact growth near transit. These include:

- Alleviate traffic congestion and promote job access: Massachusetts has been home to some of the nation’s worst traffic congestion. Furthermore, reducing VMT through investments in public transit will help improve access to jobs and services for residents without a personal vehicle.
- Improve public health outcomes: In addition to the economic benefits, there are several public health advantages to getting more people out of cars and onto public transit, walking, and biking. Auto travel causes 360 deaths annually in Massachusetts due to crashes.
- Reduce building energy demand: Multifamily housing has a more efficient building envelope and shared systems which enable more cost-effective implementation of high efficiency systems during construction.

Furthermore, smart growth ensures more land is available for preservation and carbon sequestration and alleviates pressure on the grid to accommodate the influx of electric vehicles. Importantly, land use strategies are much more cost-effective than the proposed investment in EV subsidies. They can also be designed equitably so that low-income residents are benefitted and not harmed by changes in land use, pricing, and transit service. State programs supporting development and infrastructure should be fully aligned with smart growth strategies. These strategies fall into a “no-regrets” zone in which there are few reasons the state would regret acting on them.

These strategies are only an effective pathway forward if we have long-term investments in a robust, reliable, and affordable public transportation system. The interim CECP greatly underestimates the important role public transit plays in advancing an equitable decarbonization strategy. We strongly urge the EEA to elevate the need to invest in a robust, reliable, and affordable public transportation system in the 2030 CECP. The primary way to achieve this outcome is to move more trips from single-occupant vehicles to public transit.

### **III. Chapter 3: Transforming our Buildings**

- A. Cap on heating fuel emissions must be implemented in 2023, in conjunction with other measures toward deep energy retrofits, weatherization, and electrification for existing buildings accompanied by funding, financing, and technical support for low- and moderate-income people and EJ populations.

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<sup>8</sup> Interim CECP at 25.



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As the majority of the 2.5 million buildings in Massachusetts will still be standing in 2050, the need to decarbonize existing buildings is paramount. The proposed heating fuel emissions cap (“the cap”) is the most critical solution proposed in the interim CECP to tackle this subsector. We agree with EEA that the cap is essential to reaching the 9.4 MMTCO<sub>2</sub>e reduction in emissions from buildings by 2030, the largest cut by sector in the CECP. Concurrently with the cap, EEA must take aggressive action with other policies to ensure that the cap drives carbon reductions, primarily through electrification and a swift phase-out of fossil fuel combustion in buildings, rather than through a focus on biofuel blending. DOER must not delay in convening the Commission on Clean Heat and the Task Force on Clean Heat, and must endow these bodies with a strong mandate to advance complementary policies that are needed to decarbonize existing buildings, including development of a statewide building performance standard and benchmarking and disclosure requirements. These should not just be performance-based, but also prescriptive when appropriate to move the market, such as through the use of turnover cycles as mandatory conversion points. The cap must be in effect by 2023, with declining cap levels over time.

Of equal importance to the cap mechanism is the need to ensure that this program is science-based and advances equity and climate justice. EEA must ensure that revenue from the cap is used toward a just transition for low-and-moderate income people, EJ populations, and renters, through subsidies, incentives, rebates, and technical assistance in making their homes weatherized and more energy efficient and converting their heating and cooling to non-fossil fuel systems.

### B. Improve Strategy B1 to Make New Net Zero Opt-In Code Available and Update Existing Stretch Code in 2022.

We applaud EEA for committing to a new high-performance stretch code option with passive-house level efficiency for Green Communities by 2022. Yet, the 288 Massachusetts communities currently on the stretch energy code also need the existing stretch code to be updated to be much more energy efficient (i.e., higher performance). This update should be in addition to a new net zero code pathway that cities and towns can opt into now that would enable new construction to be built not just to high levels of energy efficiency but more fully to net zero. The new opt-in net zero code for all new construction should integrate passive-house level energy efficiency, accelerate the shift to electrification, and optimize renewable energy, and should be available – in addition to the stretch code update – in 2022.

We also commend EEA on the proposal to integrate the new opt-in code into the base code by January 1, 2028. This timeline, as captured in the image below, is critical not only for new construction but should also include high-performance requirements for rehabs. To enable the transition to 2028 and ease more of the Commonwealth onto a high-performance net zero code in advance of that date, we recommend that by 2025, the existing stretch code be consolidated with the net zero opt-in code. By 2028, the stretch code would then become the base building code. Such codes are necessary to reach high levels of energy efficiency, electrify buildings, and maximize renewable energy, either onsite as practical or offsite, and to meet the needs of cities and towns – as well as the state – in both the near- and longer-term. Robust stakeholder

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engagement, including extensive outreach to EJ populations from the start, must accompany all of these code development processes.



C. Focus Mass Save/Energy Efficiency Programs on Pre-Electrification, Weatherization, and Electrification and Diversify and Develop Workforce in Strategy B2.

The CECP relies heavily on heat pumps to reach its goals, requiring at least 100,000 per year on average in residential dwellings plus a large amount in commercial space. We support these quantities, as necessary, to meet the 2030 limit. Yet the current Three-Year Energy Efficiency Plan for 2019-2021 targets roughly 15,000 heat pump installations per year. Many uncertainties exist within the interim CECP, regarding how the 100,000 annually will be attained, whether the cap on heating fuel emissions will be sufficient, and whether the plan to end all Mass Save fossil fuel heating system incentives by the end of 2024 will enable us, along with higher incentives, to shift consumers to heat pumps. EEA and DOER must demonstrate how they will achieve the annual level of heat pumps needed, including the necessary funding, financing, training, incentives, and mandates. The 2030 CECP should be clear, begin early, and transparently chart out benchmarks and milestones for success.

We urge training, education, and funding to enable whole-home conversions that do not retain back-up systems, and we urge EEA to factor realistic retention levels into their calculations. Significant funds must be devoted to deep energy retrofit programs, which will help to rightsize heat pumps and renewable systems to achieve optimal performance. Massively scaled-up workforce development funding and training will be key. Transitioning the buildings sector requires training laborers in climate-smart building technologies, especially related to HVAC, onsite solar, heat pumps, deep energy retrofits, and building operations. The expansion of a largely static industry offers new opportunities for thousands of long-term, sustainable, good paying jobs installing and maintaining new technologies. Further, the 2030 CECP should commit to resources for training workers in the fossil fuel industry to be ready for employment opportunities and benefit from decarbonization.

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During the pandemic, Mass Save offered 100-percent incentives for weatherization, an offer that thankfully continues for moderate-income customers and renters. In addition to retaining this offer in future plans, we recommend that Mass Save additionally offer a 100-percent weatherization incentive for buildings that agree to also electrify their space heating equipment, as this could help to drive adoption. Moreover, we urge the full funding and data availability needed for pre-weatherization and pre-electrification barrier mitigation, particularly for LMI and EJ customers.

Mass Save should set annual targets for enrollment of low- and moderate-income ratepayers, renters, and schools predominantly serving Black and Brown students. To meet emissions reduction targets, it is essential to enroll low- and moderate-income homeowners and renters who currently do not participate in energy efficiency programs by making the program economically feasible for all participants. The Commonwealth should consider carrots and sticks. We should align incentives between landlords and renters, such as by developing “green leases” that share the costs and benefits of efficiency upgrades. The Commonwealth should target outreach to EJ populations where there is low uptake of energy efficiency benefits to inform residents about the economic benefits of weatherization and the availability of income-adjusted programs.

### D. Calibrate the Appropriate Use of Fuel Blending as a Strategy in B3.

The Building Sector Technical Report states that for our 2050 requirements “[T]he findings of the Energy Pathways Report indicate that widespread adoption of electrification and increased efficiency measures together is likely to be a lower cost decarbonization strategy than an approach that continues to rely on pipeline gas.” For 2030, however, the interim CECP proposes a primary focus on a “Decarbonized Fuel Blending Strategy.” Fuel blending may be attractive as a short-term means to emissions cuts (depending on the true emissions profile of the biofuel), but a primary focus on fuel blending rather than fuel switching will have disproportionate long term impacts on low- and moderate-income customers and renters, who are less able to respond to changing markets and switch fuel technologies. These customers would be most impacted by industry disruption in the fuel oil delivery and most impacted in rising costs in gas delivery.

For this reason, the Commonwealth must ensure that any use of fuel blending to reduce gas and fuel oil emissions in the short term is not a “dead end” in our pathway to net zero. We must avoid misdirection of time and resources to technology that cannot scale to a long term solution, as such regrettable substitutions could impede our capacity to meet our long term emissions mandates. For gas in particular, fuel blending must not be a rationale to invest in the state’s existing distribution infrastructure beyond what is necessary for short term safety. Rather, the state must plan for a dramatic reduction in the demand for oil and gas and design an orderly and just transition away from these fuels both for residents and the workers in these industries. The Decarbonized Fuel Blending strategy is inconsistent with our climate justice values as well as the trajectory best needed to meet our 2030 and 2050 commitments.

## **IV. Chapter 4: Transforming our Energy Supply**

Out of all sectors, electricity has to lead decarbonization efforts because it is the platform for other sectors to decarbonize. Clean energy targets should be set so that, in combination with

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goals for other sectors (transportation, buildings, etc.), the overall reduction in greenhouse gas emissions for 2030 is at least 50 percent.

A. Integrate Community Engagement and Air Pollution Reduction into Strategy E1.

As the Commonwealth works to execute procurements, develop standards, and promulgate regulations to increase clean energy sources, it must ensure that there is robust public engagement to refine the details. To center frontline communities and climate justice, the CECP needs to put more emphasis on reducing air pollution and targeting health impact benefits of clean energy, as featured in the Economic and Health Report.

B. Integrate a Process to Ensure Appropriate Siting of Energy Infrastructure in Strategy E2.

Future electric and gas distribution system infrastructure should not be sited in EJ populations, except after cumulative impact reviews for projects proposed in EJ populations that include consideration of potential public health impacts and long-term harms, as well as meaningful community engagement processes wherein community concerns and ideas inform and influence decision-making starting at the initiation of the project proposal process.

When looking at the role of solar and other onshore resources to meet our goals, we need a geospatial plan for where solar will go, what is feasible on specific sites, and plans to eliminate barriers to building on brownfields and impervious surfaces. After creating this plan, the Commonwealth should then limit renewables siting on greenfields to ensure least harm to such green spaces. The Commonwealth should develop a strong incentive to put solar where it can benefit the grid and has community support while avoiding siting where it is not needed. For community solar projects, there is concern that the way some projects are structured is driven by developer financing needs rather than good planning around land use and community input. To ensure that renewables siting has the greatest benefit, we recommend adding the following points to Strategy E2:

- Integrate strategies that result in building solar facilities near load.
- When siting solar on agricultural land, preserve the opportunity for food production and other agricultural dual-use options.
- Any new incentives for solar projects must prioritize opportunities for ownership of renewable energy assets in EJ populations. Increase low income and EJ access to solar and harmonize with land use considerations.
- Support expansion of microgrids and renewable energy cooperatives: The Commonwealth should support EJ populations in accessing the benefits of renewable energy generation, including through microgrids and solar co-operatives.

C. Support for Strategy E3 to Adjust Clean Energy Standard (“CES”).

The CES should be increased to at least 60 percent by 2030 to capture the GHG emissions reduction value of our clean energy procurements. Without this increase, approved clean energy procurements from Hydro Quebec, Vineyard Wind, and Mayflower Wind will flood the REC

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market and render the CES and RPS ineffective. EEA should carefully calibrate the CES to ensure that the clean energy credit value purchased under other clean energy incentive programs is retained in our GHG emissions accounting profile.

D. Revise Strategy E3 to Remove Woody Biomass and Municipal Solid Waste Combustion as Forms of Clean Energy.

We recommend that EEA and its agencies act immediately by regulation and/or proposed legislation to remove woody biomass and municipal solid waste combustion from eligibility under all clean energy incentive programs, including the Renewable Portfolio Standard, Alternative Portfolio Standard, Clean Energy Standard, and Clean Peak Standard. Further, the 2030 CECP should include a commitment to conduct a strategic review of the impact of clean energy incentive programs on the Commonwealth's ability to meet the 2050 net zero requirement to guide further adjustments to program eligibility. Eligibility for these programs does not include a rigorous examination of the emissions profile of the included technologies, and in some cases the scientific understanding of their emissions profiles and public health impact has evolved significantly since the technology first became eligible. Massachusetts cannot meet its 2050 requirements if we continue to incentivize highly polluting technologies like woody biomass and municipal waste combustion as carbon neutral or zero carbon. Non-emitting resources are essential to achieving the net zero requirement, thus with an eye towards improving air quality and public health, Massachusetts must begin to phase out emitting resources in the near term.

E. Close Existing Facilities and Prohibit the Development of New High Heat Waste Facilities in Strategy E3 and Strategy N2; Add Zero Waste Policies.

High heat facilities in the Commonwealth, including its seven municipal waste combustors are toxic, harmful, and unnecessary. The use of pyrolysis, gasification, and incineration represent false solutions to the plastic waste reduction crisis because they do not fit into the "circular economy" of plastic waste.<sup>9</sup> Rather than produce new plastic, these processes produce either fuel that is combusted off-site or air emissions.<sup>8</sup> Thus, additional fossil fuels are needed to manufacture virgin plastics.<sup>10</sup>

We recommend that the 2030 CECP prohibit the development of new high heat facilities and establish target deadlines to close certain solid waste facilities, such as incinerators and other facilities that create a public health burden, especially for EJ populations and other vulnerable communities. Further, the 2030 CECP should include the following laws and policies that incentivize waste reduction and divert waste from high heat facilities and landfills:

- Municipal unit-based pricing policies, such as Pay-As-You-Throw.

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<sup>9</sup> See [https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment\\_June-2020.pdf](https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment_June-2020.pdf) at 11.

<sup>10</sup> See [https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment\\_June-2020.pdf](https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment_June-2020.pdf) at 8.

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- Container deposit return laws that pay redemption fees to consumers and cover a broad variety of covered containers divert more materials and lead to more recycling that produces better quality materials than curbside recycling programs, all at no expense to taxpayers.
- Producer responsibility for packaging policies which, if properly designed, can spur reduction, recycling, and redesign of material so they are reusable or more recyclable.
- Regulatory amendments to phase out incinerators.
- Regulatory amendments that would strengthen existing commercial food waste bans and create residential food waste bans.
- Increase enforcement of waste bans.

F. Set a Deadline to Achieve Clean Energy Project Deployment By 2030 in E5.

In addition to the six gigawatts of renewable energy that EEA will pursue between 2030 and 2040, Massachusetts' offshore wind procurements should total a minimum amount of clean energy deployment by 2030. We recommend that Strategy E5 set a target of at least six megawatts by 2030.

**V. Chapter 6: Protecting Our Natural and Working Lands**

Reducing fossil fuel emissions is the most important thing we can do to fight climate change, but it is also important to preserve natural and working lands (“NWL”) and increase their capacity to sequester and store carbon. NWL provide important climate resilience benefits such as cooling and shade, flood protection, and air and water filtration, as well as other benefits, such as production of food and fiber, wildlife habitat, and human recreation, scenery and quality of life. The Commonwealth should accurately and effectively value NWL as a part of our climate change strategy using best management practices aligned with international standards of carbon accounting and inventories, including conducting an inventory, establishing a baseline, and setting a numeric goal.

We recommend that the Commonwealth consider the existing research to cover the aspects of carbon flux that the technical evaluation did not already evaluate. Although the interim CECP states that additional analysis will be commissioned, we recommend that the 2030 CECP be specific about what aspects of NWL will be covered, when it will be done, how the analysis will inform strategies and action. Further, the 2030 CECP should drive more significant investment and more tangible policies among strategies to achieve lofty goals and policies.

A. Amend Strategy L1 to Preserve Trees in Urban Communities and Plant New Trees.

It is critical to increase canopy cover and sequestration in the built environment. In addition to the no net loss policy, the Commonwealth should go beyond providing incentives for protection, management and restoration, such as promulgating regulatory requirements, including through the Massachusetts Environmental Policy Act regulations, to avoid, minimize, and mitigate land

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use conversion, and incorporation of green site design within all projects. We encourage the 2030 CECP to establish annual goals for acreage and investment, improved incentives and regulations especially working with private landowners and municipalities.

It is imperative that Strategy L1 include an explicit directive to preserve healthy, mature trees and naturally vegetated areas, especially but not exclusively in the urban environment. Too often, EJ populations are waging campaigns to preserve mature trees providing many existing public health benefits in the face of development plans to remove such trees in the name of new housing or safer streets. In addition to the Resilient Lands Initiative, we recommend adding a specific action to the CECP that agencies should avoid the removal of healthy, mature trees, and mitigate any loss for transportation, development, or energy infrastructure projects. All projects undertaken by the state or receiving state funding or permits should evaluate impacts of tree removal and the ability to retain existing tree cover and add additional carbon sequestration features.

The Commonwealth needs to establish a bold goal to plant a specific number of urban and suburban trees by a certain date, with a focus on EJ populations, and along rivers, streams and meadows. We further recommend an action that requires the Commonwealth to identify priority locations to convert concrete and asphalt to green spaces in EJ populations and ensure that trees will survive and not violate accessibility laws and regulations. This recommendation is interconnected to the work to repair gas leaks and make sure that new trees are not planted in places that will be killed by gas leaks. Priority locations for tree planting should include public transit bus stops, school bus stops, and school grounds. The action should also include creating a network of shady green spaces in high-density neighborhoods across the Commonwealth using vacant lots, tax title parcels and other areas.

### B. Amend Strategy L2 To Allocate Funds and Jobs for Climate Adaptation Projects That Benefit EJ Populations.

The 2030 CECP should allocate a set amount of funds for climate adaptation projects that create public health benefits in EJ populations. The cost benefit formula of adaptation measures should consider public health benefits, reduced heat island impacts, reduced flooding damage, and first prioritization to EJ populations. Current formulas and pending legislation are based on property value instead of minimizing harm from extreme weather events, climate change, air and water quality, etc. This action requires investing in grants to non-profit organizations, cities, and towns to conserve, manage and restore NWL by expanding existing grant programs and creating new ones.

We recommend adding an action to Strategy L2 that requires developers to quantify the heating and cooling implications of their projects. To ensure that transportation, housing, and commercial development do not exacerbate heat and air quality, developers should be required to quantify the effects of new construction and tree and forest removal on urban heat levels and air

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pollution when applying for MEPA approval. The impact of gas leaks on tree health should also be considered when deciding whether to install or repair natural gas pipes or to replace them with renewable energy sources. The Commonwealth should ensure that tree planting jobs are marketed towards and accessible to EJ populations and should quantify annual forestry jobs filled by members of EJ populations.

## VI. Conclusion

Climate justice will only be achieved if EEA enacts policies that bring about concrete improvements in the health and lives of communities in the Commonwealth that continue to be disproportionately impacted by pollution and experience the worst impacts of climate change and COVID-19. The policies must be holistic and be developed and implemented with community participation. Unless climate justice is a central component of the Commonwealth's path to net zero emissions, the inequities of the Commonwealth's past energy policies will be replicated. Moreover, the final CECP should provide additional details to ensure we achieve widespread transportation and building electrification in a way that works for low- and moderate-income families and workers, expand our renewable energy supply, achieve a 50 percent reduction in GHG emissions by 2030, and maximize opportunities for NWL throughout the Commonwealth.

Thank you for your careful consideration of our comments and your current and future work to get us on the path to achieving net zero emissions by 2050 in a way that benefits all Massachusetts residents. Please contact Staci Rubin ([Srubin@clf.org](mailto:Srubin@clf.org)) or Eugenia Gibbons ([egibbons@hcwh.org](mailto:egibbons@hcwh.org)) with questions.

Sincerely,

Acadia Center  
Acton Climate Coalition (Acton, MA)  
Alternatives for Community & Environment  
Appalachian Mountain Club  
Ceres  
Conservation Law Foundation  
Clean Water Action  
Climate X Change  
Coalition for Social Justice  
Elders Climate Action - Massachusetts Chapter  
Environmental League of Massachusetts  
Green Energy Consumers Alliance  
GreenRoots, Inc.  
Health Care Without Harm  
Mass Audubon  
Mass Solar  
Massachusetts Climate Action Network  
Massachusetts Public Health Association  
Metropolitan Area Planning Council



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Mothers Out Front Massachusetts  
PipeLine Awareness Network for the Northeast  
Partnership for Policy Integrity  
Sierra Club Massachusetts  
Transportation for Massachusetts  
Union of Concerned Scientists  
Unitarian Universalist Mass Action

Francis H. Cummings  
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Via Electronic Mail and Online Portal  
March 22, 2021  
Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
gwsa@mass.gov

Subject:           Comments on the Interim 2030 Clean Energy and Climate Plan (CECP)

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

I thank the Executive Office of Energy and Environmental Affairs for your work on the 2030 Interim Clean Energy and Climate Plan and to urge you to better reflect the Climate Emergency in the final plan (“2030 CECP”) and in future plans. I am a semi-retired energy consultant with experience that includes, among other things, helping to direct preparation of Governor Weld’s 1993 Massachusetts Energy Plan.

The idea of “50x30” has become a common refrain and now represents “business as usual”. To the extent this is more ambitious than the refrain at some prior time, that’s progress. But now that 50% has apparently been nailed down as a 2030 limit by the Legislature, it would be a good time to consider whether this is sufficiently responsive to the demands of climate science to represent our state’s contribution to protecting the global climate system from breakdown or collapse, potentially during our planning horizon. The next time that EEA reconsiders the GWSA limits for any of the required years, planners should not start with a 2050 goal and work back to the present, especially if the framework assumes something like a straight line through time. In setting near-term limits, it must be recognized that the sooner an investment is made to reduce emissions, the greater will be the cumulative reduction over time. (The word “cumulative” does not seem to appear in the interim CECP.) Going forward, cumulative emissions must be disclosed for any scenarios in a CECP plan, through the target year (e.g., 2030) and though 2050. This will also enable stakeholders to compare our state’s emissions to the remaining global “carbon budget” and to combine future emissions with our historical emissions to compare our level of ambition with other states and countries, as well as with the urgent need.

As I said in my comments at the March 4, 2020 roadmap meeting in Worcester, “It seems clear that for the entire world economy to achieve net zero by 2050, some countries and states will have to be leaders by doing better than net zero, or reaching net zero sooner, to demonstrate what can be done and to compensate for the parts of the world that are likely to have difficulty

achieving net zero by 2050 themselves. Massachusetts should be a leader and do better than the global average, which could maximize [our] economic and other benefits ... (e.g., cost savings, clean energy jobs).”

The interim CECP and the underlying roadmap modeling appears to treat the level of emissions in 2030 as an INPUT. Instead, the next round of climate planning must focus on MINIMIZING 2030 emissions. While policy makers may need to make tradeoffs, the public needs to know what the options are. As I said in my Worcester comments a year ago “I urge you to include one or more scenarios in modeling ... that will substantially accelerate GHG reductions between now and 2030 consistent with climate science and the most up-to-date information on the global climate emergency, in order to identify the lowest level of 2030 GHG emissions that could be feasible with the most favorable state and federal policies.”

In view of the calls from scientists and the UN for more urgent mobilization (“Over 11,000 Scientists Declare Climate Emergency, Share 6 Steps To Save The Future”, [Forbes](#), Nov. 5, 2019), the Commonwealth would be prudent to have in place a system or person to monitor the global climate emergency and raise the alarm if our climate and energy plans may need to be strengthened. If the climate emergency becomes more extreme in some ways between now and 2030, the public’s urgency may increase for more ambitious policies and results. That would not be the time to start a new long-range planning process, but to pull some contingency plans from the proverbial shelf, that could kick in and accelerate progress.

To focus on the building sector, the final CECP should, as directed by the “Act creating a next-generation roadmap for Massachusetts climate policy” (S.9), which appears likely to be enacted soon, “quantify the emission reductions to be realized due to the electric and gas energy efficiency programs”. Then, the 3-Year Plans for those programs “shall be constructed to meet or exceed the goal set” by EEA and a report will be required immediately after each 3-year plan period on “the degree to which the activities undertaken ... met the goal for the plan set by the secretary”.

In contrast with that mandate, there is too little detail and specificity in the CECP provisions on Strategies B1 and B2 to provide clear quantitative direction to the Program Administrators and the EEAC and DPU on the emissions reductions to be realized “due to” the programs. Each quantitative measure of emission reductions in the draft CECP (see Table 4, page 29) is split between the efficiency programs and other strategie(s) such as B3 for the “Heating Fuel Emission Cap”. Going forward, the efficiency programs will be complemented by multiple other influences such as MassCEC programs, PACE financing, etc., so the CECP should specify a goal against which the efficiency Program Administrators can track the impacts of their particular programs. Notably, the emission reductions also appear to be expressed in the draft CECP in terms of the annual reductions in 2030, whereas the “Next-Generation Roadmap” bill requires each CECP to specify “emissions reductions to be realized due to the ...efficiency programs”, meaning cumulative reductions over the 3-year period.

About the only relevant quantitative detail provided in the CECP (for the whole 10-year period) is the number of households installing heat pumps (1 million) and the square footage of commercial buildings installing heat pumps and related technologies (300-400 million s.f.), and the percent of building stock completing deep retrofits (20%). For one thing, these goals should be allocated among low-income and EJ and other communities, and allocated among building types including multifamily rental properties as well as single-family homes. Other questions the CECP should answer include:

- To what extent will the Heating Fuel Emission Cap induce the 1 million households to replace their oil and gas heat with heat pumps, as opposed to:
  - inducing gas utilities and suppliers to blend biogas into their supplies, which raises multiple questions and concerns,
  - requiring increases in the MassSave and/or MassCEC budgets?
- Will the emissions cap be structured to create a stream of funding for these programs (such as through purchase of rights to emit)?
- Is it possible to achieve needed emission reductions by only targeting new heat pumps at the time when old heating systems need to be replaced? A strategy is needed to increase heat pump penetration by also targeting the best opportunities or segments for early replacement.

The lack of specificity about the funding level that will be needed to implement the plan, and that will be needed to assure that the transition represented by the CECP will be fair and equitable, is a critical shortcoming of the interim CECP. The final CECP should include funding for the efficiency programs, and in this respect the CECP should identify and consider options to reduce or eliminate the extent to which the charges for the efficiency programs and other activities increase electricity rates and thereby disincentivize the electrification that the CECP makes clear is required. Such an approach would of course need to be accompanied by a plan for other sources of funding, potentially including carbon fee(s) or revenues associated with the Heating Fuel Emission Cap. Since heat pumps will represent a significant share of funding needs, innovations should be considered, such as advance funding commitments from the state or utilities to heat pump suppliers and/or other parts of the value chain (possibly modeled after the use of the Defense Production Act in the context of COVI-19) to enable or induce them to increase supply and reduce prices to reflect reductions in risk and increases in scale.

Funding need not be concentrated in the MassSave programs. MassCEC is also included in the CECP, though also without quantification. Federal funding is important for the low-income weatherization program and potentially for scaling up a range of programs. Other state agencies could also play important funding roles, such as the role of Massachusetts Development Finance Agency for commercial PACE program and potentially for low-interest tax-free financing for various large assets (e.g., transmission, offshore wind), and the role identified for the Department of Housing and Community Development in the “Act providing for building justice with jobs” recently filed in the House (HD.3338) and Senate (SD.212).

Local municipal governments and nonprofit community organizations also require substantial and predictable funding to facilitate or achieve emission reductions for public and private

buildings and vehicles and other sources in their locations. For example, MassEnergize is a promising approach to encourage and support and track participation in adopting multiple technologies by residents and others within and across towns, and it could be expanded to all Massachusetts communities: <https://community.massenergize.org/>.

Since the Interim CECP leaves so much up in the air, it doesn't meet the new GWSA requirement (e.g., in S.9) to "quantify the emission reductions to be realized due to the efficiency programs". As one way to remedy this deficiency, EEA is on the right track to propose the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions, but the CECP plans for 2030 — and 2025 — will also need to be updated to reflect those results, as well as the outcomes of DPU 20-80 on the role of gas local distribution companies. It may be sufficient for the Commission to "make a recommendation to EEA before the end of 2021 regarding the structure and levels for long-term emissions caps" but "the end of 2022" is too late to "propose the statutory, regulatory, and financing mechanisms needed...."

At this point, a new process should be set up that coordinates all the planning work to increase the deliverables by December 2021 to include not only finalizing the new 2025 and 2030 GWSA limits but also providing enough details that all parties can accelerate program implementation. In the meantime in anticipation of the new emission reduction levels, the EEAC should be given more direction to increase budgets and targets for the new 3-Year Plan currently in development — especially for heat pump installations for the 3-year period beginning in 2022.

Thank you for this opportunity to comment on the CECP.

Sincerely,

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fcummings@gmail.com



March 22, 2021

## **FirstLight Power Comments in Response to Massachusetts Draft Clean Energy and Climate Plan for 2030**

### **Company Overview**

FirstLight Power (FirstLight) is a hydropower, energy storage, and solar generation company with assets based in Connecticut and Massachusetts. Our mission and vision is to accelerate the decarbonization of the electric grid by owning, operating, and integrating large-scale renewable energy and storage assets to meet the region's growing clean energy needs and to deliver an electric system that is clean, reliable, affordable, and equitable. Building upon our industry-leading experience in operating large-scale renewable energy and storage assets, FirstLight's vision and commitment to leading the energy industry transformation makes us uniquely positioned to navigate rapidly evolving market conditions and grow our portfolio in New England and other US markets in the years ahead.

FirstLight's hydropower facilities in New England produce over 690,000 MWh of emissions-free generation, reducing the region's carbon footprint by more than 780,000 tons annually. In addition to our conventional and run-of-river hydro facilities, we also own and operate the 1168 MW Northfield Mountain pumped hydro storage station and 29 MW Rocky River pumped hydro storage station, respectively the largest and third largest energy storage facilities in New England, 2 MW of solar PV, and 1.5 MW of behind-the-meter battery storage in Massachusetts. Our facilities represent over a billion dollars of private investment in the region, employ 130 people, and support our communities in Massachusetts with more than \$15 million in local property taxes every year.

### **General comments on the Draft Clean Energy and Climate Plan (CECP) for 2030**

We congratulate Governor Baker and the Executive Office of Energy and Environmental Affairs (EEA) for crafting an ambitious vision for accelerating the transition to a clean energy future in the Commonwealth. The CECP along with the underlying analysis in the Massachusetts Decarbonization 2050 Roadmap (the Roadmap), provides a strong foundation for climate action that will deliver substantial benefits to Massachusetts residents and communities. FirstLight

supports the proposed emissions reduction target of 45% reduction below the 1990 emissions level in 2030 and the longer-term goal of net zero emission by 2050. The urgency and scale of the changes needed to achieve those targets requires a continued aggressive push for clean energy generation and energy storage and that Massachusetts must be aggressive in pushing the full range of solutions, including clean energy supply, demand-side reductions, flexible storage options and grid infrastructure to deliver reliable, clean power.

FirstLight supports Massachusetts' efforts to decarbonize the electric sector even more rapidly than what is contemplated in the CECP, and we believe that energy storage and existing clean energy resources will play a crucial role in achieving this goal.

Energy storage provides a number of benefits to the electric grid, including moving clean energy to meet peak demand, mitigating greenhouse gas emissions, improving reliability, and addressing system resiliency. The need for energy storage in a decarbonized system is widely recognized throughout New England, and Massachusetts will benefit in terms of jobs and infrastructure in developing programs to develop storage projects throughout the state. While these benefits are generally reflected in the Roadmap and the CECP, FirstLight offers the following comments to suggest further refinements to Massachusetts' efforts to accelerate clean energy progress by better leveraging the contributions of multiple types of clean generation and storage resources.

**Optimizing the use of existing in-state resources can accelerate carbon reductions in the short-term.**

The CECP makes the important point that keeping the Commonwealth "on pace" to support Net Zero by 2050 is a near-term as well as a long-term challenge. Policies that accelerate near-term carbon reduction are an important part of the overall strategy. What happens in the next 10 years is critical to our eventual success. One way to achieve this is by utilizing existing clean energy resources differently than they are being deployed currently.

FirstLight's Northfield Mountain (an 1168-megawatt zero-emissions, fast-dispatch, nearly 8-hour duration energy storage asset) provides a clear illustration of what is possible along with the significant additional benefits that could be unlocked with a time-differentiated carbon reduction compensation signal. While existing pumped hydro currently provides substantial contributions in the wholesale energy market, they could be asked to do much more. For example, Northfield Mountain, New England's largest energy storage facility operates at approximately 25% of its overall throughput capability on an annual basis. The simplest explanation for this underutilization is that the ISO-NE energy market was not designed to reflect the carbon reduction opportunities that can be achieved by moving clean energy at the time of renewable generation to a later time when it can deliver even greater success in curbing emissions.

The potential additional value that could be unlocked by better leveraging this large-scale facility is compelling. In a study published by Energyzt, LLC in June 2020, the firm concluded

that operating just two of Northfield Mountain’s four units more frequently would produce over \$410 million in consumer savings between 2022 and 2030.<sup>1</sup> Additionally the same regimen would reduce carbon emissions by an average of 180,000 metric tonnes annually.<sup>2</sup> These values do not account for an increased use of the other pumped hydro facilities located in New England. Absent a well-designed market structure (e.g., Forward Clean Energy Market (FCEM) with time-differentiated value), the full carbon-reduction capability of existing large-scale pumped hydro facilities will not be realized<sup>3</sup>.

Increased dispatch of pumped-hydro storage is a key strategy to realizing the goals of the Roadmap. The Commonwealth has existing clean energy resources of more than 1800 MW of carbon-free grid-connected energy storage ready to make progress now toward the 2030 goals, if effective market signals are implemented.

### **Enable and incentivize the pairing of offshore wind procurements with at-scale storage procurements**

FirstLight applauds the Baker Administration’s ambition to develop a mature offshore wind industry in Massachusetts. However, in order to maximize the value of that clean energy procurement, we recommend that Massachusetts more fully employ existing grid-connected energy storage and enable the Commonwealth to deliver greater carbon reduction performance and greater value to consumers. The scale of New England’s offshore wind programs demands similarly sized flexible storage solutions.

*The Massachusetts 2050 Decarbonization Roadmap notes, “to affordably and reliably operate an electricity grid based on variable renewable generation, a balanced portfolio of clean generation technologies shared across a broad geographical region is need. Together with offshore wind power, the Commonwealth needs a similarly large volume of solar generation....additional energy storage, and several new high-voltage transmission lines...”<sup>4</sup>*

Without specific requirements or pricing incentives to maximize on-peak clean energy delivery, a unique opportunity to capture greater synergies from existing electric storage will be missed. As noted above, the Commonwealth has these resources now, ready to meet its 2030 goals – over 1800 MW of carbon-free grid-connected energy storage that is underutilized in the current market.

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<sup>1</sup> Energyzt, LLC, *Northfield Mountain Pumped Storage: Assessment of Contract Benefits in an Increasingly Renewable Region* (June 2020), 35.

<sup>2</sup> *Ibid.* 34.

<sup>3</sup> Recently filed legislation by Massachusetts Representative Thomas Golden (HD. 3292) and Senator Julian Cyr (SD 1687) would establish a process by which the Commonwealth would leverage bilateral contracts to develop new large-scale energy storage and ensure that existing large-scale energy storage will be dispatched in coordination with large-scale renewable resources to capture environmental and economic value. These bills may serve as a model strategy to capture the States goals in the near-term while market reforms are under construction.

<sup>4</sup> *Massachusetts 2050 Decarbonization Roadmap*, p. 23



**Local based, existing clean energy resources like conventional hydropower must also be part of the solution.**

Locally based hydropower resources, particularly those located in Massachusetts, should be credited as a valuable part of the solution. In addition to providing zero-emissions generation, local conventional hydropower assets support peak demand, provide ramping, regulation, and other ancillary services within Massachusetts load zones, and help to improve summer and winter peak reliability. Combining energy storage with flexible generation such as hydropower will substantially contribute to additional system reliability, particularly during summer and winter peaks.

While imported hydro resources are important additions to the system, supporting and maintaining locally sourced resources provides a number of additional benefits to Massachusetts that are not often considered, including local jobs and taxes. Further, locally based hydropower does not face the risk of reductions or curtailments introduced by neighboring control area needs or long distance transmission lines accompanying imports.

We recommend that DOER consider policies that would enable the Commonwealth to capture the additional value that storage paired with local hydropower resources can provide. In particular, we recommend that the current eligibility criteria for clean peak credits be extended to new storage resources paired with existing in state hydro resources of the type that can qualify for the existing hydro tier of the Clean Energy Standard (CES), rather than limiting participation to only Class I renewables. For example, pairing storage with FirstLight's Cabot/Turners Falls facilities would directly support better integration of locally made hydropower onto the grid, but because of the size and vintage requirements for Class I resources, those facilities are currently excluded. This seems contrary to the Commonwealth's stated goals in the clean peak program, and limiting participation to in state facilities would ensure that the benefits of the program stay in state.

**The CES program should be expanded to allow the participation of all in-state clean energy resources regardless of vintage or historical participation in other state programs.**

FirstLight recommends the expansion of the CES program, particularly the expansion of the CES-E program. The program wisely acknowledges the value that existing clean energy resources bring to the region, a critical component left out of the original Clean Energy Standard program. Ideally, the CES should create an environment that fosters the continued success of new and existing clean energy resources, both of which are necessary to attain Massachusetts' carbon reduction goals. Given Massachusetts' ambitious statutory goals, the Commonwealth will need as many clean energy resources as it can develop and maintain.

Unfortunately, the program unnecessarily limited the participation of numerous existing resources, including those that are physically located in Massachusetts but have previously participated in programs in other jurisdictions out of necessity. Massachusetts has historically excluded certain existing clean energy resources from participating in the RPS and other

renewable programs through vintage requirements. In past years, other states have captured the environmental attributes of Massachusetts-based clean energy resources due to an absence of comparable programs within the Commonwealth.

From a practical standpoint the current program maintains this dynamic, which serves to slow the attainment of the Commonwealth's environmental goals and leads to higher costs to Massachusetts ratepayers than is necessary. If the CES program allowed existing clean energy resources to participate regardless of historical participation in other jurisdictions' programs, it would appropriately realize the opportunity to claim these resources' environmental attributes and limit the need for an equal amount of newly built renewable resources, which far exceed the cost of existing resources.

Alternatively, in-region resources may be forced to sell their services outside New England where such contributions offer better opportunity. New York in particular is moving aggressively to meet near-term electric-sector renewable goals (70% renewable energy by 2030 is required under New York law) and existing hydro, wind and solar resources in New England may very likely seek to export to the NY market if they are left out of clean energy compensation programs. Whether by retirement, deactivation, or exporting, Massachusetts is not well served by eroding the baseline of existing zero-emissions resources, which only increases the challenge of meeting the ambitious goals of the Commonwealth.<sup>5</sup>

Massachusetts should consider eliminating the proposed restriction on Massachusetts based assets, as those resources represent a significant amount of greenhouse gas emission (GHG) free generation that provide additional ancillary benefits to Massachusetts residents in the form of jobs and tax revenue. Maintaining these resources should be an additional priority of the CES program.

The state's current RPS is comprised of a complex list of technology-specific incentives that date back to a time when renewable resources were limited and there were very few available commercial technologies. The Commonwealth should also consider revising the RPS to harmonize with the CES' technology-neutral approach, an approach that is also being adopted successfully in other states, to create opportunities for the most cost-efficient and innovative resources to be deployed.

**Market structure changes as part of a regional decarbonization strategy will accelerate progress most cost-effectively.**

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<sup>55</sup> This pattern has already been observed in states (including Connecticut in New England) that were forced to support existing nuclear facilities with long-term contracts to maintain their zero-emissions generation. The New York experience illustrates the progression directly—first New York sought to support nuclear facilities with zero emissions credit contracts, and then more recently has issued an RFP for existing wind and hydro resources to participation to avoid risk that those resources would export to PJM or NE ISO. See <https://www.governor.ny.gov/news/governor-cuomo-announces-new-competitive-program-retain-new-yorks-existing-renewable-energy>. Now New England will face a similar risk if existing renewables are left out of the solution.

Beyond the CECP, we congratulate the Baker Administration for its leadership role in the New England Energy Vision effort to reform regional energy markets to find least-cost way to accommodate regional decarbonization goals. Several regional solutions are key to this effort.

The New England States have each approached resource planning by leveraging reports that not only detail decarbonizing the generation sector but also critically how best to move decarbonized electricity to where the supply is needed most. Transmission is a critical component to grid resiliency and reliability, but it is not the only solution available. As we have seen throughout New England, it can be incredibly difficult to site and build new transmission anywhere in the region. It is also costly to do so, necessitating a more holistic approach to grid planning and buildout. Energy storage, particularly targeted grid scale storage, can serve as a less costly and more easily sited alternative to some transmission buildout.

Storage offers fewer siting challenges than miles-long transmission corridors and can be situated in critical areas for resiliency and reliability purposes. Its flexibility offers a range of value to the localized grid; including reducing peak demand, congestion management, renewable integration, curtailment management, resiliency improvements, and decreasing carbon emissions. We recommend that the Commonwealth consider leveraging grid-scale energy storage as an alternative to some transmission development.

#### **The retirement of obsolete fossil resources needs to be addressed.**

While it is important that the New England states continue to focus on the necessary buildout of renewable generation, transmission, and storage alternatives, all resources will require a healthy competitive wholesale market. That outcome will require efficient exit to complete the fleet evolution. Beyond assuring market health, efficient retirement of resources that are not needed will free up valuable interconnection space on the grid to decrease the cost of interconnecting new renewable resources and energy storage.

With the New England states appropriately focused on achieving market-based clean energy entry to meet their goals, it is also important to assure that the ISO-NE market has efficient retirement signals. Improving market entry without assuring efficient market exit will ultimately prove unhelpful to maintaining healthy operation of the fleet of clean energy resources the fleet of backstop and balancing resources needed to integrate them.

This concern is not hypothetical—the existing wholesale capacity markets actually discourage rarely used resources from retiring once they reach that point of obsolescence. Absent an effective retirement signal, such obsolete resources are encouraged to remain in the Forward Capacity Market (FCM) to collect capacity payments in exchange for providing very little system value, which is the current state of affairs. Most of these older units run on oil, which when combined with their very inefficient heat rates yield very expensive (and high emission) energy supplies that are rarely asked to operate. Yet these units receive revenue streams through the ISO-NE capacity market. There does not seem to be evidence that the Pay for Performance (PFP) program instituted by ISO-NE is affecting the retirement decisions of resources, as the region has seen minimal retirements since PFP has been in place. A review of the regional data

reveals a similar story. For example, despite oil generators receiving 20% of capacity revenues in ISO-NE, they only supply 0.52% of energy on average. Coal's declining capacity is also reflected in generation that has declined to less than 0.1% of generation in 2020, though it still received 1.5% of the capacity revenues.<sup>6</sup> By contrast, while renewables such as hydropower received up to 16% of capacity revenues, they provided 18.7% of energy on average.

The reality is that many obsolete resources are paid the same capacity payment as resources that are more actively employed, yet they may never be called on to provide any real value to the system or do any of the "work" to keep the system running. The current FCM design promotes this inefficiency, as the obsolete resources require little maintenance (due to little, if any, work required of them), pushing capacity prices below levels sustainable in the end by the marginal resources actively supporting the system. FirstLight recognizes that capacity payments and payments for energy production compensate different values. Nonetheless, it is undeniable that the mismatch in capacity payments and production noted above is not effectively channeling scarce electric ratepayer funds to the resources we need and instead channeling funds to the least desired resources.

Restoring a meaningful retirement signal is fundamental to efficiently achieving state policy goals, including properly planning, siting, and developing transmission infrastructure. Encouraging obsolete resource retirement will free valuable, underutilized, interconnection space for new clean energy and energy storage projects. Making this existing infrastructure available to clean energy resources will minimize the amount of new investment in transmission and other grid upgrades, saving consumers money by more efficiently utilizing the existing system infrastructure.

In addition to helping reduce the need for some additional transmission resources, restoring meaningful retirement signals will also provide the following benefits:

- Encouraging resources that are the highest cost energy options, and which often correspond with the highest greenhouse gas emissions rates per megawatt-hour, to cease operation. Even if the capacity sale obligation does not lead too much, if any, economic dispatch of that high emissions power, the capacity supply obligation requires the resource to run at least two times per year to meet capacity market audit requirements.
- Many of New England's biggest sources of greenhouse gas emissions were sited close to environmental justice communities, disproportionately affecting those communities through their emissions. Replacing these resources with renewable assets and electric storage can provide economic benefits to communities in the form of new investment and property taxes.

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<sup>6</sup> Per average generation and capacity supply obligation by obligation month between 2017 and 2020 per ISO-NE, *Forward Capacity Auction Capacity Obligations* at [https://www.iso-ne.com/static-assets/documents/2018/02/fca\\_obligations.xlsx](https://www.iso-ne.com/static-assets/documents/2018/02/fca_obligations.xlsx) and ISO-NE *Daily Generation by Fuel Type* at <https://www.iso-ne.com/isoexpress/web/reports/operations/-/tree/daily-gen-fuel-type>

- Market rules encouraging efficient retirements will support the market outcomes that attract and retain the full set of resources needed to meet state policy - both the new and existing clean energy resources and the back-up/balancing resources needed to integrate them.

## Summary

The Roadmap highlights a number of pathways toward decarbonization, focusing primarily on new development required to achieve emissions reductions. Massachusetts should also consider the role that existing resources, deployed differently in the service of decarbonization, can play. As a leading provider of carbon-free generation in Massachusetts, FirstLight has a strong interest in developing energy storage projects here in the Commonwealth, particularly those that leverage our existing fleet of zero-carbon hydropower. FirstLight believes that both existing and new resources are needed to effectively mitigate the impacts of climate change. Existing storage and conventional hydro resources can be deployed in the service of new renewable integration and to help Massachusetts meet its climate change goals. Maintaining these existing resources and strategically deploying them to capture the additional value that they are capable of providing should be a priority of the Commonwealth.

FirstLight also encourages Massachusetts to recognize that successful evolution of the New England grid to achieve state clean energy goals requires changes to assure efficient market exit as much as assuring efficient new market entry by clean resources, especially those situated at critical locations along the grid that could potentially offset the need for some transmission buildout.

Thank you for your consideration.

Sincerely,



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FirstLight Power  
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Secretary Kathleen Theoharides  
Massachusetts Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

March 22, 2021

Subject: Comments on Draft Clean Energy and Climate Plan for 2030

\*Please note these comments were also included in a submission by Staci Rubin at CLF\*

To Secretary Theoharides:

Thank you for providing us an opportunity to comment on the draft interim Clean Energy and Climate Plan (CECP) for 2030. Our organizations all have a stake in the Commonwealth's transportation sector and the state's ability to provide a more sustainable, equitable, accessible, and cleaner transportation system to allow our economy to grow while reducing greenhouse gas (GHG) emissions.

The Commonwealth has made progress on reducing GHG emissions, especially in the electricity sector, through investing in renewable energy and energy efficiency. GHG emissions from transportation, however, remain stubbornly high -- the single largest contributor in the state of any sector of our economy.

The Draft CECP is a good start toward reducing emissions, but must be improved if we are to achieve our goals as a Commonwealth. We recommend that the Executive Office of Energy and Environmental Affairs (EEA) strengthen the 2030 CECP in a number of ways to reflect a multi-pronged approach to reducing transportation emissions, including tailpipe pollution that disproportionately harms marginalized communities. These provisions include: speeding up implementation of the Transportation and Climate Initiative Program equity investments; focusing electric-vehicle (EV) adoption on buses and public fleets; increasing EV sales goals to 50% by 2030; reducing the upfront EV cost burden while including e-bikes; focusing on environmental justice (EJ) populations; implementing strategies to reduce vehicle miles traveled

(VMT); and improving and expanding public transportation and biking and pedestrian infrastructure. Transportation for Massachusetts has outlined specific comments for these and other initiatives in the sections below.

**In Section 2.2, Add a New Strategy: *Expand Public Transit Operations Throughout the Commonwealth and Transition to Electric Buses and Trains.***

The 2030 CECP plan glaringly omits investments in public transportation, biking, and walking as strategies to reduce VMT and GHG emissions. In addition to the electrification of the bus fleets and implementing the Rail Vision approved by the MBTA FMCB, promotion of and investment in public transportation are critical to a sustainable clean future. The first recommendation of the Baker Administration's Commission on the Future of Transportation report, completed in December of 2018 is to, “Prioritize investment in public transit as the foundation for a robust, reliable, clean, and efficient transportation system...because high-frequency, high-capacity public transit is the most efficient and sustainable way to move large numbers of people as they go about their daily lives.”<sup>1</sup> In addition to investments in public transit, the Commonwealth should make investments in walking and biking infrastructure around public transit stations so pedestrians and cyclists can safely access public transportation.

Investing in public transportation has many co-benefits for public health beyond reducing congestion and reducing single occupancy vehicle (SOV) trips. Studies show that investment in public transit increases physical activity (PA). A [2015 study](#) of transit users in Salt Lake City showed that “public transit users spend approximately 20 min per day in PA on days they use transit and 10 min per day on days they do not use transit, compared with approximately 5–6 min per day in PA for non-transit users.”<sup>2</sup> Increased PA improves individual health, reduces the burden on the health care system, lowers health care and employer costs, and improves overall public health. In addition, increased use of public transit will reduce traffic fatalities for Massachusetts residents. According to the [Centers for Disease Control \(CDC\)](#), “An analysis of the transportation fatality risk in the U.S. found that the fatality rates per billion passenger miles traveled between 2000 and 2009 were 0.11 for buses, 0.24 for urban mass transit rail trains, 0.43 for passengers on commuter rails, and 7.28 for drivers or passengers in a car or light truck.”<sup>3</sup>

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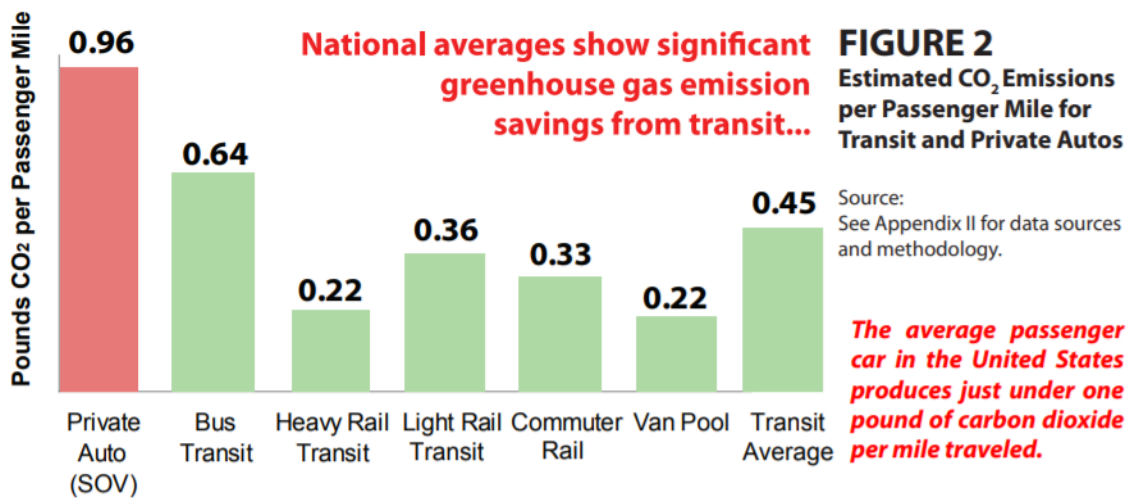
<sup>1</sup> Commission on the Future of Transportation, *Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1*; Page 36, 2018.

<https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>

<sup>2</sup> Harvey J. Miller, et al. “Public transit generates new physical activity: Evidence from individual GPS and accelerometer data before and after light rail construction in a neighborhood of Salt Lake City, Utah, USA,” *Health Place*, September 1, 2015. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4679466/>

<sup>3</sup> <https://www.cdc.gov/policy/hst/hi5/publictransportation/index.html> from Savage I. Comparing the fatality risks in United States transportation across modes and over time. *Research in Transportation Economics*. 2013;43(1):9-22.

Public transit also produces significantly less GHG emissions per mile than SOVs. We agree with the Commission on the Future of Transportation’s report that “Only by attracting and retaining new riders can the Commonwealth see the benefits that transit can provide for GHG reduction, congestion relief, economic growth, and community revitalization.”<sup>4</sup> A 2010 study by the Federal Transit Administration shows that “heavy rail transit, such as subways and metros...produce 76% less in greenhouse gas emissions per passenger mile than an average single-occupancy vehicle (SOV). Light rail systems produce 62% less and bus transit produces 33% less.” See the graphic below:



Source:

<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PublicTransportationsRoleInRespondingToClimateChange2010.pdf>

To promote more equity in the transit systems and increase access to public transit for EJ communities, the MBTA and Regional Transit Authorities (RTAs) should adopt low-income fares for those who qualify. The CECP should set targets for increased investment in public transit including promotion of ferry, bus, commuter bus, commuter rail, and subway services. Access to transit is a lifeline to many who have no other means of transportation to reach destinations, such as jobs, schools, grocery stores and healthcare facilities, safely and reliably.

EEA should encourage transit-oriented development (TOD) that disincentivizes private vehicle use while providing greater access to public transit. TOD projects must also build and preserve

<sup>4</sup> Commission on the Future of Transportation, Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1; Page 36, 2018. <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>



affordable and family-oriented housing to ensure that those who would most benefit from improved access to transit can afford to live closest to it. The Administration signed into law an important provision in the Economic Development Bond Bill that expands multifamily zoning in MBTA communities, which is a vital first step. However, this measure and other efforts to use TOD to reduce transportation emissions will only be successful if coupled with investments in a robust, reliable, and affordable public transit system.

Finally, Massachusetts should require companies of a certain size to offer pre-tax commuter benefits for their employees. Cities and states, including San Francisco and New Jersey, have adopted laws to mandate offering these benefits to employees. A [2016 report to the California legislature](#) on the effects of commuter-benefit mandates showed that an estimated 44,000 employees in the San Francisco Bay Area shifted from driving alone to another form of transportation. This resulted in a reduction of an estimated 35,778 tons of CO<sub>2</sub> emissions over the first 12 months of the program's implementation. There is no reason to believe that similar results would not materialize if Massachusetts were to adopt a statewide mandate.

### ***Section 2.2 Strategy T1: Cap Transportation Sector Emissions & Invest in Clean Transportation Solutions***

The Baker Administration's leadership on The Transportation and Climate Initiative Program (TCI-P) has put Massachusetts at the forefront of tackling GHG emissions from the transportation sector. We applaud the Administration for its work on this important program. For TCI-P to work equitably to benefit all Massachusetts residents, especially those living in EJ communities that have been historically disproportionately impacted by GHG emission from transportation, the Administration should prioritize an inclusive and open process. The signing of the Memorandum of Understanding by Massachusetts, Connecticut, Rhode Island, and the District of Columbia was an important step, but more work remains. Adoption of TCI-P follows the recommendation of the Commission on the Future of Transportation, which wrote that a cap-and-invest program for transportation, “Will expand more efficient and lower carbon forms of transportation, including public transit, electric vehicles, biking and walking, and other options, and this investment should result in job creation within the region and consumer savings.”<sup>5</sup>

Specifically, the Administration needs to develop a detailed public plan for a public engagement/decision-making process to determine how to spend TCI-P revenue, including specifying investment targets in walking, transit, and biking infrastructure. In addition to this plan, we support increasing the investments of TCI-P revenue in EJ communities from 35% to at

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<sup>5</sup> Ibid, pg.

56. <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>

least 70% and outlining the specific makeup and appointment process for the Equity Advisory Body by the end of 2021.

Our organizations are pleased to see in the CECP the inclusion of a Low Carbon Fuel Standard (LCFS) for Massachusetts and surrounding states. The CECP should specify which fuels qualify for the standard. What biofuels would meet the LCFS? The transportation of biofuels could occur by truck that results in increased emissions in communities along truck routes and near fuel blending facilities. At present, those facilities are disproportionately located in environmental justice populations. The CECP needs to outline a plan that avoids negative impacts associated with the transportation of biofuels and mitigate potential impacts on EJ populations.

### **Section 2.2 Strategy T2: *Implement Coordinated Advanced Clean Vehicle Emissions & Sales Standards***

We support the CECP's inclusion of targets to transition from internal combustion engine vehicles (ICEVs) to zero-emission vehicles, including a target of 750,000 on our roads by 2030. But the CECP should also set targets for public transit vehicle transition from diesel to zero-emission vehicles. We recommend establishing targets for school buses, public transit buses, regional rail, and state and municipal fleets. We recommend that the final 2030 CECP set targets to electrify public transit and school buses by 2030.

Electrifying our public transit systems and school buses will result in improved air quality and will reduce the burdens associated with air pollution hotspots. Other recommendations include:

- Implementing the MBTA Bus Transformation Office approved by the Fiscal and Management Control Board recommendations from November 2019 by prioritizing new electric bus procurements on routes serving EJ populations. The MBTA must begin immediate planning and design work for 100% electric bus facilities to meet the goal of having a 100% electric bus fleet by 2030.
- Implementing the MBTA Rail Vision approved by the Fiscal and Management Control Board in November 2019 with priority electrification for the Fairmount Line, Newburyport/Rockport Line through Lynn, and Providence/Stoughton Line by 2024. Plan to electrify the remainder of the commuter rail system by 2035.
- The 2030 CECP must set targets to electrify state and municipal fleets by 2035: Fleets owned, leased, or operated by the Commonwealth or municipalities should transition to zero-emission vehicles with priority in locations that are air pollution hotspots in EJ populations.

We support the decision to adopt California's Advanced Clean Car Standard, Advanced Clean Truck (ACT) Rule, and Advanced Clean Fleets Rule. However, California needs a waiver from

the EPA before the Advanced Clean Truck rule can come into effect and be enforced by Massachusetts. Further, California is expected to finalize regulations for the Clean Car Standard II in 2022 and the policy goes into effect only in 2026. Instead of waiting for later in the decade to take action, it is crucial that Massachusetts immediately develop and implement policies and programs to accelerate EV adoption and begin the rulemaking process immediately.

### **Section 2.2 Strategy T3: *Reduce Upfront ZEV Purchase cost Burden***

Incentivizing ZEVs for individuals, businesses, and institutions at the point of sale with rebates through the MOR-EV program will continue to bring down the upfront costs of ZEVs over time. This strategy, however, falls short of widespread adoption in EJ communities as ZEVs continue to be priced much higher than ICEVs.

We recommend Massachusetts commit to implementing a ZEV rebate program for moderate-and-low income residents, and mandating MOR-EV rebates at point of purchase by the end of 2021.

In addition to rebates for EVs sold for passenger cars and light and heavy duty vehicles, the MOR-EV program should expand the definition of vehicles to include electric bikes (e-bikes) and offer upfront incentives for e-bike purchases. Municipalities like Ashland, OR offer incentives for e-bikes including up to [\\$300 incentives](#) and British Columbia currently offers [\\$1,050 rebates](#). Lowering the upfront costs of e-bikes will make them more accessible to more residents -- especially low-income residents in EJ populations -- while also promoting mode shift and transportation alternatives to reduce dependency on single-occupancy vehicles.

The Commonwealth should investigate utilizing the “Mass Save” brand for its vehicle incentives programs. “Mass Save” has high awareness and familiarity with Massachusetts residents, and the brand value of “Mass Save” can help automobile dealers in the Commonwealth sell zero-emission vehicles.

To incentivize EV adoption for larger fleets including municipalities and the Commonwealth, Massachusetts should establish a group purchasing program to lower costs for state/municipal ZEV procurements by the end of 2021.

### **Section 2.2 Strategy T4: *Deploy Electric Vehicle Supply Equipment & Enable Smart Charging***

To achieve widespread adoption of EVs for both individual and commercial vehicles the commonwealth must increase EV charging infrastructure and set goals for the number of charging stations for both commercial and residential properties.

To achieve success, Massachusetts should:

- Set a numeric target for the number of charging stations that need to be built in the next decade to meet ZEV goals. The [EV- Pro Lite tool](#) can be used to estimate the charging needs and impacts on load profile. According to the Commission on the Future of Transportation’s report “While Massachusetts is among the top ten states in terms of the number of charging stations and outlets presently available, more work needs to be done to provide a sufficient charging infrastructure to support vehicle electrification.”<sup>6</sup>
- Launch curbside/utility pole charging programs in collaboration with municipalities, and establish incentives for other challenging sectors.
- Require utilities to propose alternative rate structures and consumer incentive programs to encourage charging overnight or at other beneficial times.
- EV charging should be designed to accommodate EVs, e-bikes, and e-scooters, and other forms of micro-mobility.
- Provide incentives for purchase of residential charging stations to promote EV adoption.

### **Section 2.2 Strategy T5: *Engage Consumers & Facilitate Markets***

Raising awareness of EV programs like MassEVolve, MOR-EV-Trucks, and Drive Green programs is crucial to further adoption of EVs statewide. To gauge the success of these initiatives EOEEA should provide an annual report on the strategy actions in the 2030 CECP including the ACTNow and the MassCEC pilot programs on medium- and heavy-duty ZEVs, urban delivery & fleet electrification, and EV charging infrastructure discussed in this section. In addition, DOER should consider folding incentives for EVs, including e-bikes, and residential charging stations under the MassSave program brand to easily raise awareness for these initiatives.

### **Section 2.2 Strategy T6: *Stabilize Light-Duty VMT & Promote Alt Transportation Modes***

Reducing vehicle-miles-traveled (VMT) is perhaps the most important strategy to reduce GHG emissions from the transportation sector and the 2030 CECP falls short on the strategies and policies to address VMT and promote alternative transportation modes. The Commonwealth cannot just “stabilize VMT” -- we must reduce VMT on an annual basis through the CECP and other strategies. If we do not provide opportunities for Massachusetts residents to do less driving, we simply won’t be able to meet our environmental and quality-of-life goals.

Under the status quo, VMT is projected to increase 21% from 2010-2030. By the 2030 CECP’s own admission, “Since 1990, the number of vehicle-miles traveled (VMT) annually has steadily

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<sup>6</sup> Ibid, pg. 26.

<https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>

increased and passenger vehicle purchases have trended toward larger vehicles (e.g., sport utility vehicles) in the last decade. The increase in VMT and vehicle size has largely offset the emissions benefit from more stringent federal fuel efficiency standards." If we reduce VMT, it makes all of our goals on transforming our fleets and greening our grid easier to achieve, while also delivering substantial, lasting co-benefits in cost-effective ways. If we reduce VMT, it makes all of our goals on transforming our fleets and greening our grid easier to achieve, while also delivering substantial, lasting co-benefits in cost-effective ways. Measures to reduce VMT must be paired with efforts to accelerate the transition to electric vehicles. Both strategies will be critical.

We appreciate the clear goal to reduce commuter VMT per employee by 15% by 2030. To build on this, we suggest applying this goal to all trips, rather than just commutes. California has already adopted this same target of reducing VMT per capita by 15% by 2030. We must invest in a transportation system where residents can use public transit or active transportation for the 87% of daily trips that are not commutes.

The Commonwealth needs to include land use and housing policies in a holistic approach to the transportation sector. This involves including DHCD, in addition to EEA, MassDEP, and MassDOT in the coordinated approach to reducing VMT. The development of housing in the right locations at affordable cost levels is a critical component of a state-wide approach to reducing VMT. Shifting land use patterns and improving multi-modal options has many co-benefits, including improving economic mobility, reducing commute times, improving public health outcomes by reducing air pollution and traffic fatalities, and conserving open space, which is necessary for carbon sequestration to be a successful mitigation tool. Mode-shift should be an explicit goal for the Commonwealth.

Telecommuting is not a policy solution. Promoting "telecommuting" would exacerbate inequities, resulting in higher-income office workers staying home during the workday, and lower-income service and retail workers needing to commute via car or on transit that would be even harder to fund due to reduced ridership. Furthermore, many workers who expect to continue telecommuting after the public health restrictions are lifted still anticipate returning to the office at least some of the time. We need more frequent public transit service that is able to accommodate increasingly flexible commuting patterns if we want to prevent the return of a congestion crisis.

MassDOT should establish a plan and target date to implement congestion or road pricing in Greater Boston. [Studies](#) of cities and regions around the world show that congestion pricing reduces car traffic and congestion in some cases up to 30%. Congestion pricing in Massachusetts could provide a consistent source of funding for commuter rail, bus, and subway service, and improve quality of life for residents. Based on an analysis of expected revenue loss from the gas

tax and EV uptake, the need to establish a plan and target date to implement road pricing is only more important the longer it takes to accomplish this. The Commission on the Future of Transportation also recommends that “MassDOT should consider various congestion pricing strategies that compel changes in default transportation behaviors on corridors that are or could be served by transit and/or new mobility options. In order to provide an economic market signal, MassDOT should consider and pilot congestion-pricing strategies.”<sup>7</sup> The Legislature recently passed a roadway and congestion pricing commission as part of the transportation bond bill that was vetoed by Governor Baker that would have started this process. Out of the ten most populous metropolitan areas in the country, metro Boston is the *only one* that does not use some form of time of day roadway pricing to control congestion.

Thank you for you for allowing us to comment on the Draft 2030 CECP and we hope you will incorporate our recommendations to set targets for fleet electrification, implement congestion pricing, expand incentives for EV infrastructure and e-bikes, reduce rather than stabilize VMT, coordinate between agencies to implement TOD projects, and invest and promote public transportation.

Signed,

***T4MA Member Signatories***

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Transportation for Massachusetts

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Executive Director  
LivableStreets Alliance

Jack Spence  
Transportation Working Group  
350 Massachusetts

Lizzi Weyant  
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Metropolitan Area Planning Council

Jordan Stutt  
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Acadia Center

John Stout  
Transportation Advocate  
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<sup>7</sup> Ibid, pg 42.

<https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>

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March 22, 2021

**BY ELECTRONIC SUBMISSION**

Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

**RE: Public Comments on the Interim Clean Energy and Climate Plan for 2030 (2030 CECP)**

Equinor Wind US LLC (“Equinor”), in its capacity as service operator of OCS Leases A-0512 and A-0520, is pleased to comment on the Executive Office of Energy and Environmental Affairs’ Interim Clean Energy and Climate Plan for 2030 (“2030 CECP”) released in December 2020. We welcome the opportunity to discuss these comments at any time.

Equinor commends the Executive Office of Energy and Environmental Affairs (“EEA”) for its work to produce the 2030 CECP, which sets forth a nation-leading emissions reductions target of 45% below the 1990 level by 2030. The 2030 CECP, along with EEA’s 2050 Decarbonization Roadmap study, embraces the goal of advancing decarbonization in the building, transportation and electricity sectors, while relying on generation from reliable and sustainable resources such as offshore wind. Equinor looks forward to working with the Administration on furthering the role of offshore wind generation in the Commonwealth.

Equinor, combined with its affiliates and ultimate parent Equinor ASA, is a global energy producer with nearly five decades of experience in safely developing and operating large-scale offshore assets and infrastructure, including offshore wind resources and electric transmission systems. Equinor is the largest offshore wind developer in the U.S. with 3,300 MW of awarded capacity. Equinor, together with its strategic partner BP, hold OCS Lease A-0520, located offshore New England, and OCS Lease A-0512, located offshore New York/New Jersey. Equinor is in early phase development of both leases. In 2019, Equinor’s 816-megawatt (“MW”) Empire Wind 1 project, within OCS Lease A-0512, was selected as a winner in New York State’s first offshore renewable energy certificate (“OREC”) solicitation. Earlier this year, Equinor was selected for the largest-ever U.S. OREC award by New York State. Under the award, Equinor will provide generation capacity of 1,260 MW of renewable offshore wind power from Empire Wind 2, located within OCS Lease A-0512, and another 1,230 MW of power from Beacon Wind 1, located within OCS Lease A-0520.<sup>1</sup> All told, these three projects will generate 3,300 MW of renewable electricity, enough to power nearly two million homes.

As highlighted in Section 4.01 (Sector Overview) of the 2030 CECP, the demand for electricity will likely double by 2050, in large part due to the electrification of the building and transportation

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<sup>1</sup> The execution of the procurement award is subject to the successful negotiation of a purchase-and-sale agreement with the New York State Energy Research and Development Authority.



sectors, which must occur to meet the Commonwealth’s interim and long-term emissions reductions targets. Offshore wind is a reliable and low-cost renewable energy resource ready to serve as a major piece of the foundation of a decarbonized energy system in Massachusetts. With offshore wind infrastructure continuing to develop in the United States and with more cost-efficient and operationally effective technology emerging, offshore wind will provide ratepayers with access to an affordable renewable energy resource. To ensure the continued development of offshore wind to meet the Commonwealth’s targets, Equinor urges EEA to continue to work with the Bureau of Ocean Energy Management (“BOEM”) in advancing future leasing in the region and, more generally, the deployment of offshore wind in the region.

With decades of ocean engineering, in-depth knowledge of energy markets and a network of partners and suppliers, Equinor is uniquely positioned to support the Commonwealth’s offshore wind goals and we look forward to the opportunity to participate in future procurements. We appreciate the opportunity to submit comments on the 2030 CECP and welcome the opportunity to discuss these comments with the Secretary and staff.

\* \* \*

I am a retired RN from Gloucester MA. The first Earth Day occurred in my first year of college, 1970. I was concerned enough then to organize the school's response. Now I've had an entire nursing career, raised two kids, and have 3 grandchildren, ages 27,21 and 16. I've always said the most important things in life were nature, friends and loved ones. With age this has only proved to be more and more true. If you have food and clean water, a roof over your head, clean air, your health, are free of fear, can speak your mind, have meaningful work and also friends, family and natural beauty it is a glorious world to be part of. This is a world worth fighting for all to have. I'm so pleased at the consideration of justice issues in the CECP and the for the national dialogue taking place for a just transition and a green recovery for all. These are changes that provide hope.

I thank you for your diligent work and for many of the plans contained in the CECP report. Still, it does not go far enough and seems like a list of "to do's" without enough specific measures. It feels to me that the plan is trying to respond to a serious situation while emphasizing the preservation of the economy by prolonging timelines and only identifying or starting the needed changes. It seems a compromise between the scientific view of climate change and the business view.

Meanwhile, I am clear that we are already in an emergency, fraught by accelerating feedback loops with potentially unimaginable catastrophic effects. I believe the science is correct and if business was concerned with a longer-term strategy of 20-30 years, instead of immediate gains and asset protection, they would be asking you to move faster, too.

The economic side of rising seas, extreme weather, soaring temperatures, drought, fires, food supply disturbance, drinking water shortages and ultimately structural relocation and climate migration exist already and are increasing threats to us here. These outcomes are devastating to our health, our livelihoods and all aspects of our peace and physical and economic security. The inevitable economic costs of current CO2 levels are already going to be exorbitant; the more we add the higher the cost. Delaying action for any reason is clearly penny wise and pound foolish. Perhaps you are still in denial, as if we have the time for incremental and less disruptive solutions. Or perhaps your charge to respond to our reality has been bridled by the clout of economic interests who pretend there is time, because it is inconvenient to do otherwise. Meanwhile, the scientific community says time's up.

The things that cause me to speak to you this way are:

Your choice of 45% greenhouse gas emissions reduction. That is clearly not enough. The fact that the needed changes are hard to do doesn't change the need to do them. The next 9 years are particularly critical. Hopefully, It appears 50% will be passed in the MA legislature soon, as well as nationally perhaps on this coming Earth Day.

Calling the 2050 goal “net-zero” seems a misleading way to describe 85% reduction in GHG from fossil fuel use reduction, 15% sequestration. I prefer the goal to be 350ppm. Much less prone to interpretation, fudging and missing the mark. It will take all measures, on a large scale, to avoid the worst effects of what has been set in motion around the globe. No time for conservative incrementalism and delayed action dates.

Building and transit electrification are critical, based on their 27% and 40% approximate contribution to GHG in MA. However, I am completely opposed to further development of the nuclear or biomass industries to meet electric needs. Neither should be defined as viable renewables. Additionally, public transit and Smart Growth are not emphasized enough in CECP.

Where is the awareness displayed in your report that we live within a wholistic ecology; that we depend on healthy natural systems, that they are central to planetary health and function. Their disruption must be looked at as seriously as transitioning away from fossil fuels. They should not be viewed as getting us through that last most difficult 15%, or as potential credits to buy from elsewhere. We actually need to prioritize living in harmony with nature and regenerating the planets natural systems. There is so much benefit to be gained there.

Commodifying carbon and quantifying carbon sequestration clouds clarity on many levels. Carbon is a building block of life, not an enemy. I ask you, what has caused it to be overabundant in our air and water? So many of the world’s problems originate in allowing extraction for personal gain and the creation of multitudes of unnecessary and disposable commodities and for them to be somehow valued over the protection of the Earth, human life, species health, biodiversity and the acknowledgement of our interdependence with nature. Humans, and his methods, are the problem not carbon. The same amount of carbon exists as always, we have unbalanced its natural locations. Currently the ocean is overburdened with carbon and the land is carbon poor. Carbon rebalancing is critical and simultaneously helps solve food issues, desertification, flooding AND sequestration.

The Commonwealth is still trying to figure out how to burn wood for fuel, log large trees, and sees using trees for durable wood products as a carbon saving solution. Trees make the best carbon sinks as living trees in a forest, in yards and parks and urban environments, while they provide spaces of renewal, biodiversity habitat and heat island cooling in urban environments. Climate change has progressed enough so that an as yet unknown quantity of our trees and forests will be lost to climate related disease, drought, fire and extreme weather. It is the wrong time to allow these assets and their societal benefits to be diminished for cash. Instead, they need protection. We need proforestation policies, where public land is prioritized for sequestration. Subsidies should be offered to private land owners that reflects their valued climate benefits as undeveloped land. Tree planting strategies should proliferate.

As a culture, we continue to develop farm land and open space, clear cutting trees and encroaching on wetlands, as if those natural areas don’t possess a much greater value as healthy functioning ecosystems. These policy flaws, in this moment, are unchallenged in your

plan. It is a business-friendly plan and therefore inadequate to stem the tide. These same business assets and humans will pay the price for every underdone action you have presented.

I know this plan was a serious effort, involving lots of time, effort and resources. I am certain of your sincerity of purpose. I thank you for many of the measures you have incorporated. Again, its drawback is it doesn't go far enough, especially regarding recognition of the value of natural systems. I can only wonder if you are unable to internalize the gravity of our shared reality, if you are still pretending that there is time that no longer exists.

Sincerely,  
Marcia F Hart RN  
2 Fremont St  
Gloucester, MA  
01930



ActonClimateCoalition.org  
actonclimatecoalition.org/#contactus

Via Electronic Mail and Online Portal

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
gwsa@mass.gov

Subject: Comments on the Interim 2030 Clean Energy and Climate Plan (CECP)

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

We write on behalf of the Acton Climate Coalition (“Coalition”) and The Climate Mobilization to thank the Executive Office of Energy and Environmental Affairs for your work on the 2030 Interim Clean Energy and Climate Plan and to urge you to better reflect the Climate Emergency in the final plan. We also add our support to the “Joint Comments to Ensure Inclusion of Climate Justice” also being submitted today. The Acton Climate Coalition is comprised of 36 local member organizations, including businesses and elected officials, and is now working to implement the Climate Mobilization called for in the Town’s Declaration. The Climate Mobilization, a national climate organization based in NYC, is working closely with the Coalition and is joining the Coalition in submitting these comments.

On September 8, 2020 the Acton Town Meeting overwhelmingly passed a Resolution under Article 5, entitled “Declaring a Climate Emergency: A Better Future Starting Now.” The entire Declaration is included in this letter because virtually all of its points are directly relevant to the Commonwealth of Massachusetts as well as the town of Acton.

Specifically, we urge that the 2030 CECP:

1. Include in the final CECP a declaration of a Climate Emergency, with provisions such as those in Acton’s Declaration (below);

2. Commit the Commonwealth not only to meet the 2030 emissions limit of 45% or 50% under the Global Warming Solutions Act, but also — using the language of our Declaration — to “commit to a climate mobilization effort, with appropriate support from the federal government, to bring net state-wide carbon emissions to zero as quickly as possible, with a target date of 2030”, on a scale not seen since World War II;
3. “Provide appropriate legislative, regulatory, and financial support to municipalities to implement local Climate Emergency initiatives” as resolved in Article 5, including increasing the *funding* available to Town governments, and to owners of buildings and vehicles where necessary, to make the needed emission reductions economically attractive. The Town of Acton is committed to moving rapidly to reduce economy-wide greenhouse gas emissions, but in some cases is restrained from acting by state regulations, such as the current state pre-emption of local restrictions on fossil fuel piping for new buildings;
4. Follow the recommendations of the “Joint Comments to Ensure Inclusion of Climate Justice”;
5. Specify the total *cumulative* emissions over the 2021–2030 period that would result from the strategies in the CECP — in other words, how much of the remaining global “carbon budget” the Commonwealth would be spending;
6. Recognizing that evolving climate science and the UNFCCC process may soon require “ratcheting” up our “contributions,” prepare for that contingency by establishing an explicit process to identify key needs and opportunities to implement *additional* strategies, actions and/or funding that would further reduce cumulative statewide emissions by accelerating carbon reductions.

The following is the text of Article 5, Acton Town Meeting, September 8, 2020:

### **Declaring a Climate Emergency: A Better Future Starting Now**

Whereas, in a world facing extreme challenges, including rapid climate change, Acton residents understand the importance of protecting the Earth and its inhabitants, can envision a better, sustainable future, and can create and execute bold plans for a prosperous economy and a thriving community;

Whereas, progress toward this future is underway in Massachusetts, which is among national leaders on climate initiatives (for example, there are 117,000 jobs in the state’s clean energy sector; Massachusetts has been named the most energy efficient state for the past nine years; and as a founding member of the Regional Greenhouse Gas Initiative, the Commonwealth has steadily increased the proportion of renewables in our electricity supply);

**Whereas**, Acton has an engaged Town government, and has undertaken a number of important steps on climate and the environment, the Town is well placed to implement the critical transition away from fossil fuels, and to advance a robust, carbon-free, equitable economy, and the improved health and quality of life that will result;

**Whereas**, the use of fossil fuels — such as oil, coal, and natural gas — is causing unprecedented increases in greenhouse gases in our atmosphere and ensuing climate change impacts;

**Whereas**, the Fourth National Climate Assessment, released in 2018 by the federal government, calls out the cascading risks of climate change, including disruptions to food, water supply, transportation, public health, and national security, as well as major risks to economies and ecosystems;

**Whereas**, in October 2018 the United Nations released a special report that: projected that limiting warming to 1.5°C (2.7°F) above pre-industrial levels will require deep emissions reductions and rapid, unprecedented transitions in all aspects of society; found that there are clear benefits to keeping warming to 1.5°C rather than 2°C (3.6°F) or higher; and asserted that “Every bit of warming matters. Every year matters and every choice matters”;

**Whereas**, restoring a safe and stable climate requires a Climate Mobilization — an emergency initiative on a scale not seen since World War II, with resolute leadership and coordination necessary at all levels of government and in all sectors of society — in order to: (1) reach net zero carbon emissions across all sectors of the economy; (2) rapidly and safely remove excess carbon from the atmosphere, at emergency speed, to levels that restore safe, pre-industrial climate conditions and (3) implement measures to protect all people and species, and ecosystem integrity, from the consequences of climate breakdown;

**Whereas**, many localities, organizations, and countries have adopted a goal of net zero carbon emissions by 2030, there is now worldwide momentum behind developing and deploying the technical, economic, and political means to achieve this goal;

**Be It Therefore Resolved**, that the residents of the Town of Acton hereby declare that a Climate Emergency threatens our town, state, and nation, as well as humanity broadly, and that a mobilization to meet this challenge is both an imperative and an unprecedented opportunity to stabilize the climate, remedy environmental harms, create clean-energy jobs, and improve human lives.

**Be It Further Resolved**, that the members of Acton Town Meeting call on Town government and staff, and all Acton civic groups, businesses, and residents to commit to a climate mobilization effort, with appropriate support from the state and federal governments, to bring net Town-wide carbon emissions to zero as quickly as possible, with a target date of 2030.

**Be It Further Resolved**, that the Town of Acton’s climate mobilization should also: (1) accelerate adaptation and resilience strategies in preparation for intensifying local and global climate impacts; (2) protect trees, forests, and other open spaces because of their ability to draw carbon out of the atmosphere and store it; and (3) ensure that the costs of such mobilization efforts do not unfairly burden those who are economically or socially disadvantaged, and that the benefits of a realized, sustainable future accrue to all.



**Be it Further Resolved**, that the Town of Acton calls on state and federal elected officials to initiate a Climate Emergency mobilization, and provide appropriate legislative, regulatory, and financial support to municipalities to implement local Climate Emergency initiatives.

Thank you for this opportunity to comment on the CECP. If you have any questions, you may contact [actonclimatecoalition.org/#contactus](https://actonclimatecoalition.org/#contactus), or Fran Cummings, 33 Martin Street, Acton, MA 01720, [fcummings@gmail.com](mailto:fcummings@gmail.com).

Sincerely,

Acton Climate Coalition, by its Steering Committee:

Carolyn Platt, League of Women Voters of Acton Area

Debra Simes, Green Acton

Fran Cummings, Green Acton

Jim Snyder-Grant, Green Acton

Jude Aronstein, Mothers Out Front Acton

Karen Herther, Market Dynamics

Karen Root Watkins, Mothers Out Front Acton

Lee Ketelsen, Mothers Out Front Acton

Paul Reisberg, Elders Climate Action

Sargam Nohria, Sunrise Movement Acton

Stella Ko, Indivisible Acton Area MA

The Climate Mobilization, by Rebecca Harris, Organizing Director

March 22, 2021

Dear Governor Baker & Secretary Theoharides,

As elected and appointed municipal officials representing a diverse range of residents and communities in the Commonwealth of Massachusetts, we respectfully submit the following feedback in regard to the interim Clean Energy and Climate Plan (2030 CECP). Comments below include both general feedback and specific opportunities to collaborate with or empower municipalities to engage in local efforts to curb carbon emissions.

## General Feedback

- **Center equity in the CECP.** Environmental justice communities, low income, and energy burdened residents must be prioritized in the state's work to cut emissions. Adoption of new technologies is expensive, and most current incentive programs exclude or are inaccessible for low income residents. Black, Brown, and Indigenous people tend to live in communities with disproportionately high amounts of pollution and suffer higher rates of related diseases. We cannot allow this trend to continue. Further, different municipalities will require different levels of support to carry out some of the work outlined in the 2030 CECP. For example, what works for Cambridge, likely will not work for Worcester and what works for Worcester, likely won't work for small towns like Barre.
- **Clarify the obligations of cities and towns.** According to the draft CECP, achievement of the plan will require "action at all levels of government." The 2030 CECP should be a master plan that provides a centralized statement of necessary municipal and/or local actions and timelines to guide municipalities in their climate planning and activities.

## Buildings & Heating Sector

- **Establish net-zero opt-in stretch building code** in 2022 and adopt as a statewide base code by 2025.
  - In addition to making buildings highly efficient with electric infrastructure, consider opportunities to make buildings 'energy storage ready.'
- **Create a workforce development and training programs** developed with labor partners to ensure good paying union certified buildings sector jobs.
- **Stop all fossil fuel incentives** through MassSave by 2022.
- **Create a statewide building energy and emissions disclosure requirement** to gather data to better guide future programs. Similar policies are already in place in Boston and Cambridge.
- **Set mandatory GHG emissions reduction limits on the building sector** statewide by 2022 (enforcement starting by 2025) via a declining limit on CO<sub>2</sub>e from heating fuel

suppliers and investment in comprehensive whole home retrofits for low and moderate income households and small businesses that include health and safety repairs, weatherization, and electrification.

- Before making improvements or repairs on the gas distribution system, run a cost benefits analysis for electrification vs. gas.

## Transportation Sector

- **Expand and improve transit**, active transportation and micro-mobility options across the state in combination with policies like transit oriented development, multi-family zoning to reduce vehicle miles traveled (VMT).
  - School districts are required to offer regionalized transportation, which is sometimes underfunded or under-utilized. Are there opportunities to encourage parents to use bus transportation to get their kids to school?
- **Set 100% electrification targets** for transit and school buses (2030), commuter rail (2035), and municipal and state fleets (2035).
  - Expand electric vehicle incentives programs and support Zero Emission Vehicle (ZEV) bulk purchasing programs for municipalities to lower procurement costs when transitioning their vehicle fleets
- Develop and implement a suite of programs to **accelerate electric vehicle adoption** in medium-and-heavy duty sector, TNC, delivery, and other fleets with high vehicle miles traveled (VMT)
- **Implement and expand rebate programs** for moderate-and-low income residents to purchase new and used EVs and an incentive program for heavy duty ZEV by the end of 2021.
- **Develop transportation emissions-reduction policies specifically tailored for rural communities.** Rural Massachusetts residents predominantly rely on personally-owned vehicles for transportation and existing public transit options have failed to provide meaningful alternatives. Good resources for future policies include the [2018 Future of Transportation Commission Report](#) (see page 67) and [2019 Rural Policy Plan](#) (see pages 20-27).

## Electricity Sector

- **Raise clean energy standard to 100% renewable electricity by 2035**
  - Set a minimum target of 6 GW offshore wind installed by 2030
  - Set a minimum target for [9300 MW](#) of solar by 2030, while at the same **time incentivizing development near existing loads**
- **Create targeted incentive programs** for local renewable electricity for low and moderate-income, energy burdened residents, and residents of environmental justice communities. These communities should receive at least 50% of statewide clean energy investments at no cost to residents.

- **Align municipal light plant programs with decarbonization goals.**
- Consider options to **expand opportunities for municipally-owned energy systems** to allow for increased local benefits of large solar arrays and renewable infrastructure.
- **Remove clean energy incentives** for woody biomass or solid waste combustion. These incentives artificially create a market for waste
- Perform an **assessment of grid infrastructure upgrade needs for electrification of housing and transportation** and significant additional renewable generation by 2022 and start implementation in 2023 with a prioritization investment in low income and rural communities at no costs to energy burdened residents.

## Industrial and Other Sectors

- **Minimize and eliminate methane leaks** from the natural gas distribution network.

We know the path to 2030 is absolutely critical in the longer road to net zero emissions by 2050. The 2018 IPCC report says that a global minimum emissions reduction of 50% by 2030 is necessary to avoid the worst of climate change. While we consider the scale and breadth of change necessary to eliminate dependence on fossil fuels, we must also remember that the next 10 years also represent a significant and unique opportunity. The world is moving to embrace sustainability. Our state has the wealth, technology, and emissions profile to move quickly to adopt new green innovations. This is an opportunity to lead the nation and grow our local and regional economy by creating new, well-paying jobs. Massachusetts cities and towns are ready for a sustainable future. Will you partner with us by leading the state to a clean energy future in 2030?

Sincerely,

Darcy DuMont	Amherst	Town Councilor
Lynn Griesemer	Amherst	Town Councilor
Patricia DeAngelis	Amherst	Town Councilor
Robert Scherer	Ashland	Member, Select Board
Ashwin Ratanchandani	Ashland	Chair, Sustainability Committee
Charles Lidz	Ashland	Member, Board of Assessors; Sustainability Committee
Matthew Marshquist	Ashland	Member, Sustainability Committee
Margy Gassel	Ashland	Member, Sustainability Committee
Michelle Wu	Boston	City Councilor At-Large
Andrea Campbell	Boston	City Councilor, District 4
Matt O'Malley	Boston	City Councilor, District 6
Raul Fernandez	Brookline	Member, Select Board
Nancy Heller	Brookline	Member, Select Board; Co-Chair, SB Climate Action Committee

Quinton Zondervan	Cambridge	City Councilor
Patricia Nolan	Cambridge	City Councilor
Marc McGovern	Cambridge	City Councilor
Christine Smith	Canton	Member, Sustainability Committee
Katy Clark	Canton	Member, Sustainability Committee
William Courchesne	Chicopee	City Councilor
Cheryl Rose	Dalton	Chair, Conservation Commission
Henry Rose	Dalton	Member, Conservation Commission
Judith Stetson	Falmouth	Member, Conservation Commission; Finance Committee
Margareth Shepard	Framingham	City Councilor, District 7
Cobi Frongillo	Franklin	Town Councilor
Alex Morse	Holyoke	Mayor
Joe Pato	Lexington	Member, Select Board
Mark Sandeen	Lexington	Member, Select Board
Samantha Perlman	Marlborough	City Councilor At-Large
Laura Wagner	Marlborough	City Councilor, Ward 1
Nicole Morell	Medford	City Councilor
Timothy Van Egmond	Montague	Member, Energy Committee
Sally Pick	Montague	Member, Energy Committee
Andreae Downs	Newton	City Councilor At-Large
Maria Greenberg	Newton	City Councilor, Ward 1
Emily Norton	Newton	City Councilor, Ward 2
Tarik Lucas	Newton	City Councilor, Ward 2 At-Large
Julia Malakie	Newton	City Councilor, Ward 3
Andrea Kelley	Newton	City Councilor, Ward 3 At-Large
Pam Wright	Newton	City Councilor, Ward 3 At-Large
Alicia Bowman	Newton	City Councilor, Ward 6 At-Large
Vicki Danberg	Newton	City Councilor, Ward 6 At-Large
Holly Ryan	Newton	City Councilor, Ward 8
David Narkewicz	Northampton	Mayor
Gina-Louise Sciarra	Northampton	City Councilor At-Large, Council President
John Thorpe	Northampton	City Councilor, Ward 4
Alex Jarrett	Northampton	City Councilor, Ward 5
Marianne LaBarge	Northampton	City Councilor, Ward 6
Rachel Maiore	Northampton	City Councilor, Ward 7
Leslie Harrison	Northborough	Member, Open Space Committee; Community Preservation Committee; Vice Chair, Historic District Commission; Alternate, Zoning Board of Appeals

Patrick Kavey	Pittsfield	City Councilor, Ward 5
Kristen Strezo	Somerville	City Councilor At-Large
Lance Davis	Somerville	City Councilor, Ward 6
Katjana Ballantyne	Somerville	City Councilor, Ward 7
Jesse Lederman	Springfield	City Councilor At-Large
Julie Smith-Galvin	Wakefield	Town Councilor
Mehreen Butt	Wakefield	Town Councilor
Caroline Bays	Watertown	Town Councilor At-Large
Tony Palomba	Watertown	Town Councilor At-Large
Lisa Feltner	Watertown	Town Councilor, District B
Lise Olney	Wellesley	Member, Select Board
Laurie DiDonato	Wendell	Member, Select Board
Henry Art	Williamstown	Member, Conservation Commission
Anne O'Connor	Williamstown	Member, Select Board
Stephanie Boyd	Williamstown	Member, Planning Board

Via [Online Portal](#)

Secretary Kathleen Theoharides  
Massachusetts Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

March 22, 2021

Subject: Transportation Comments on Draft Clean Energy and Climate Plan for 2030

To Secretary Theoharides:

Thank you for providing us an opportunity to comment on the draft interim Clean Energy and Climate Plan (CECP) for 2030. Our organizations all have a stake in the Commonwealth's transportation sector and the state's ability to provide a more sustainable, equitable, accessible, and cleaner transportation system to allow our economy to grow while reducing greenhouse gas (GHG) emissions.

The Commonwealth has made progress on reducing GHG emissions, especially in the electricity sector, through investing in renewable energy and energy efficiency. GHG emissions from transportation, however, remain stubbornly high -- the single largest contributor in the state of any sector of our economy.

The Draft CECP is a good start toward reducing emissions, but must be improved if we are to achieve our goals as a Commonwealth. We recommend that the Executive Office of Energy and Environmental Affairs (EEA) strengthen the 2030 CECP in a number of ways to reflect a multi-pronged approach to reducing transportation emissions, including tailpipe pollution that disproportionately harms marginalized communities. These provisions include: speeding up implementation of the Transportation and Climate Initiative Program equity investments; focusing electric-vehicle (EV) adoption on buses and public fleets; increasing EV sales goals to 50% by 2030; reducing the upfront EV cost burden while including e-bikes; focusing on environmental justice (EJ) populations; implementing strategies to reduce vehicle miles traveled (VMT); and improving and expanding public transportation and biking and pedestrian infrastructure. We have outlined specific comments for these and other initiatives in the sections below.

**In Section 2.2, Add a New Strategy: *Expand Public Transit Operations Throughout the Commonwealth and Transition to Electric Buses and Trains.***

The 2030 CECP plan glaringly omits investments in public transportation, biking, and walking as strategies to reduce VMT and GHG emissions. In addition to the electrification of the bus fleets and implementing the Rail Vision approved by the MBTA FMCB, promotion of and investment in public transportation are critical to a sustainable clean future. The first recommendation of the Baker Administration's Commission on the Future of Transportation report, completed in December of 2018 is to, "Prioritize investment in public transit as the foundation for a robust, reliable, clean, and efficient transportation system...because high-frequency, high-capacity public transit is the most efficient and sustainable way to move large numbers of people as they go about their daily lives."<sup>1</sup> In addition to investments in public transit, the Commonwealth should make investments in walking and biking infrastructure around public transit stations so pedestrians and cyclists can safely access public transportation.

Investing in public transportation has many co-benefits for public health beyond reducing congestion and reducing single occupancy vehicle (SOV) trips. Studies show that investment in public transit increases physical activity (PA). A [2015 study](#) of transit users in Salt Lake City showed that "public transit users spend approximately 20 min per day in PA on days they use transit and 10 min per day on days they do not use transit, compared with approximately 5–6 min per day in PA for non-transit users."<sup>2</sup> Increased PA improves individual health, reduces the burden on the health care system, lowers health care and employer costs, and improves overall public health. In addition, increased use of public transit will reduce traffic fatalities for Massachusetts residents. According to the [Centers for Disease Control \(CDC\)](#), "An analysis of the transportation fatality risk in the U.S. found that the fatality rates per billion passenger miles traveled between 2000 and 2009 were 0.11 for buses, 0.24 for urban mass transit rail trains, 0.43 for passengers on commuter rails, and 7.28 for drivers or passengers in a car or light truck."<sup>3</sup>

Public transit also produces significantly less GHG emissions per mile than SOVs. We agree with the Commission on the Future of Transportation's report that "Only by attracting and retaining new riders can the Commonwealth see the benefits that transit can provide for GHG

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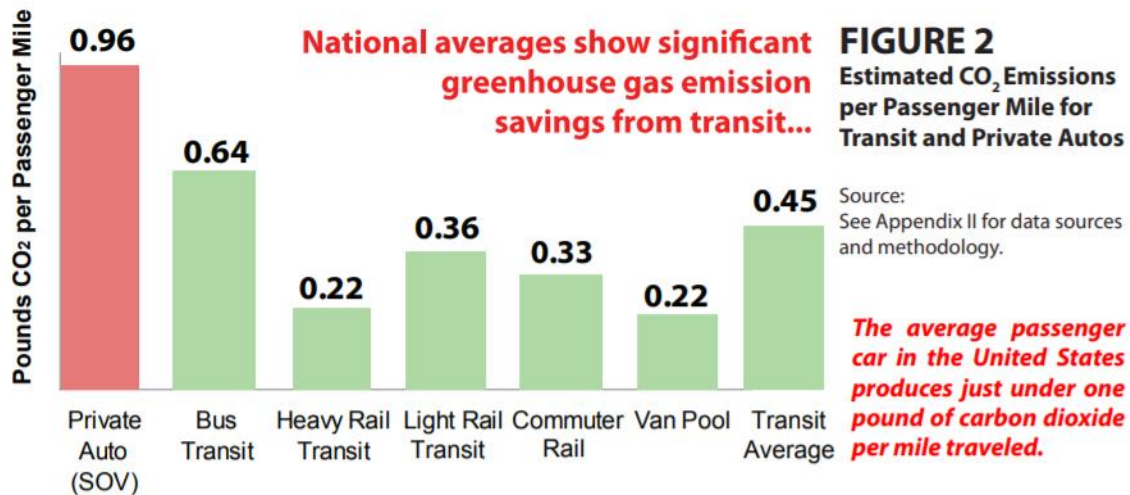
<sup>1</sup> Commission on the Future of Transportation, *Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1*; Page 36, 2018. <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.

<sup>2</sup> Harvey J. Miller, et al. "Public transit generates new physical activity: Evidence from individual GPS and accelerometer data before and after light rail construction in a neighborhood of Salt Lake City, Utah, USA," Health Place, September 1, 2015. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4679466/>.

<sup>3</sup> <https://www.cdc.gov/policy/hst/hi5/publictransportation/index.html> from Savage I. Comparing the fatality risks in United States transportation across modes and over time. Research in Transportation Economics. 2013;43(1):9-22.



reduction, congestion relief, economic growth, and community revitalization.”<sup>4</sup> A 2010 study by the Federal Transit Administration shows that “heavy rail transit, such as subways and metros...produce 76% less in greenhouse gas emissions per passenger mile than an average single-occupancy vehicle (SOV). Light rail systems produce 62% less and bus transit produces 33% less.” See the graphic below:



Source:

<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PublicTransportationsRoleInRespondingToClimateChange2010.pdf>

To promote more equity in the transit systems and increase access to public transit for EJ communities, the MBTA and Regional Transit Authorities (RTAs) should adopt low-income fares for those who qualify. The CECP should set targets for increased investment in public transit including promotion of ferry, bus, commuter bus, commuter rail, and subway services. Access to transit is a lifeline to many who have no other means of transportation to reach destinations, such as jobs, schools, grocery stores and healthcare facilities, safely and reliably.

EEA should encourage transit-oriented development (TOD) that disincentivizes private vehicle use while providing greater access to public transit. TOD projects must also build and preserve affordable and family-oriented housing to ensure that those who would most benefit from improved access to transit can afford to live closest to it. The Administration signed into law an important provision in the Economic Development Bond Bill that expands multifamily zoning in

<sup>4</sup> Commission on the Future of Transportation, Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1; Page 36, 2018. <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.

MBTA communities, which is a vital first step. However, this measure and other efforts to use TOD to reduce transportation emissions will only be successful if coupled with investments in a robust, reliable, and affordable public transit system.

Finally, Massachusetts should require companies of a certain size to offer pre-tax commuter benefits for their employees. Cities and states, including San Francisco and New Jersey, have adopted laws to mandate offering these benefits to employees. A [2016 report to the California legislature](#) on the effects of commuter-benefit mandates showed that an estimated 44,000 employees in the San Francisco Bay Area shifted from driving alone to another form of transportation. This resulted in a reduction of an estimated 35,778 tons of CO2 emissions over the first 12 months of the program's implementation. There is no reason to believe that similar results would not materialize if Massachusetts were to adopt a statewide mandate.

### ***Section 2.2 Strategy T1: Cap Transportation Sector Emissions & Invest in Clean Transportation Solutions***

The Baker Administration's leadership on The Transportation and Climate Initiative Program (TCI-P) has put Massachusetts at the forefront of tackling GHG emissions from the transportation sector. We applaud the Administration for its work on this important program. For TCI-P to work equitably to benefit all Massachusetts residents, especially those living in EJ communities that have been historically disproportionately impacted by GHG emission from transportation, the Administration should prioritize an inclusive and open process. The signing of the Memorandum of Understanding by Massachusetts, Connecticut, Rhode Island, and the District of Columbia was an important step, but more work remains. Adoption of TCI-P follows the recommendation of the Commission on the Future of Transportation, which wrote that a cap-and-invest program for transportation, "Will expand more efficient and lower carbon forms of transportation, including public transit, electric vehicles, biking and walking, and other options, and this investment should result in job creation within the region and consumer savings."<sup>5</sup>

Specifically, the Administration needs to develop a detailed public plan for a public engagement/decision-making process to determine how to spend TCI-P revenue, including specifying investment targets in walking, transit, and biking infrastructure. In addition to this plan, we support increasing the investments of TCI-P revenue in EJ communities from 35% to at least 70% and outlining the specific makeup and appointment process for the Equity Advisory Body by the end of 2021.

Our organizations are pleased to see in the CECP the inclusion of a Low Carbon Fuel Standard (LCFS) for Massachusetts and surrounding states. The CECP should specify which fuels qualify

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<sup>5</sup> Ibid, pg. 56. <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.

for the standard. What biofuels would meet the LCFS? The transportation of biofuels could occur by truck that results in increased emissions in communities along truck routes and near fuel blending facilities. At present, those facilities are disproportionately located in environmental justice populations. The CECP needs to outline a plan that avoids negative impacts associated with the transportation of biofuels and mitigate potential impacts on EJ populations.

### ***Section 2.2 Strategy T2: Implement Coordinated Advanced Clean Vehicle Emissions & Sales Standards***

We support the CECP's inclusion of targets to transition from internal combustion engine vehicles (ICEVs) to zero-emission vehicles, including a target of 750,000 on our roads by 2030. But the CECP should also set targets for public transit vehicle transition from diesel to zero-emission vehicles. We recommend establishing targets for school buses, public transit buses, regional rail, and state and municipal fleets. We recommend that the final 2030 CECP set targets to electrify public transit and school buses by 2030.

Electrifying our public transit systems and school buses will result in improved air quality and will reduce the burdens associated with air pollution hotspots. Other recommendations include:

- Implementing the MBTA Bus Transformation Office approved by the Fiscal and Management Control Board recommendations from November 2019 by prioritizing new electric bus procurements on routes serving EJ populations. The MBTA must begin immediate planning and design work for 100% electric bus facilities to meet the goal of having a 100% electric bus fleet by 2030.
- Implementing the MBTA Rail Vision approved by the Fiscal and Management Control Board in November 2019 with priority electrification for the Fairmount Line, Newburyport/Rockport Line through Lynn, and Providence/Stoughton Line by 2024. Plan to electrify the remainder of the commuter rail system by 2035.
- The 2030 CECP must set targets to electrify state and municipal fleets by 2035: Fleets owned, leased, or operated by the Commonwealth or municipalities should transition to zero-emission vehicles with priority in locations that are air pollution hotspots in EJ populations.

We support the decision to adopt California's Advanced Clean Car Standard, Advanced Clean Truck (ACT) Rule, and Advanced Clean Fleets Rule. However, California needs a waiver from the EPA before the Advanced Clean Truck rule can come into effect and be enforced by Massachusetts. Further, California is expected to finalize regulations for the Clean Car Standard II in 2022 and the policy goes into effect only in 2026. Instead of waiting for later in the decade to take action, it is crucial that Massachusetts immediately develop and implement policies and programs to accelerate EV adoption and begin the rulemaking process immediately.

### **Section 2.2 Strategy T3: *Reduce Upfront ZEV Purchase cost Burden***

Incentivizing ZEVs for individuals, businesses, and institutions at the point of sale with rebates through the MOR-EV program will continue to bring down the upfront costs of ZEVs over time. This strategy, however, falls short of widespread adoption in EJ communities as ZEVs continue to be priced much higher than ICEVs.

We recommend Massachusetts commit to implementing a ZEV rebate program for moderate- and-low income residents, and mandating MOR-EV rebates at point of purchase by the end of 2021.

In addition to rebates for EVs sold for passenger cars and light and heavy duty vehicles, the MOR-EV program should expand the definition of vehicles to include electric bikes (e-bikes) and offer upfront incentives for e-bike purchases. Municipalities like Ashland, OR offer incentives for e-bikes including up to [\\$300 incentives](#) and British Columbia currently offers [\\$1,050 rebates](#). Lowering the upfront costs of e-bikes will make them more accessible to more residents -- especially low-income residents in EJ populations -- while also promoting mode shift and transportation alternatives to reduce dependency on single-occupancy vehicles.

The Commonwealth should investigate utilizing the “Mass Save” brand for its vehicle incentives programs. “Mass Save” has high awareness and familiarity with Massachusetts residents, and the brand value of “Mass Save” can help automobile dealers in the Commonwealth sell zero-emission vehicles.

To incentivize EV adoption for larger fleets including municipalities and the Commonwealth, Massachusetts should establish a group purchasing program to lower costs for state/municipal ZEV procurements by the end of 2021.

### **Section 2.2 Strategy T4: *Deploy Electric Vehicle Supply Equipment & Enable Smart Charging***

To achieve widespread adoption of EVs for both individual and commercial vehicles the commonwealth must increase EV charging infrastructure and set goals for the number of charging stations for both commercial and residential properties.

To achieve success, Massachusetts should:

- Set a numeric target for the number of charging stations that need to be built in the next decade to meet ZEV goals. The [EV- Pro Lite tool](#) can be used to estimate the charging

needs and impacts on load profile. According to the Commission on the Future of Transportation's report "While Massachusetts is among the top ten states in terms of the number of charging stations and outlets presently available, more work needs to be done to provide a sufficient charging infrastructure to support vehicle electrification."<sup>6</sup>

- Launch curbside/utility pole charging programs in collaboration with municipalities, and establish incentives for other challenging sectors.
- Require utilities to propose alternative rate structures and consumer incentive programs to encourage charging overnight or at other beneficial times.
- EV charging should be designed to accommodate EVs, e-bikes, and e-scooters, and other forms of micro-mobility.
- Provide incentives for purchase of residential charging stations to promote EV adoption.

### **Section 2.2 Strategy T5: *Engage Consumers & Facilitate Markets***

Raising awareness of EV programs like MassEVolve, MOR-EV-Trucks, and Drive Green programs is crucial to further adoption of EVs statewide. To gauge the success of these initiatives EOEEA should provide an annual report on the strategy actions in the 2030 CECP including the ACTNow and the MassCEC pilot programs on medium- and heavy-duty ZEVs, urban delivery & fleet electrification, and EV charging infrastructure discussed in this section. In addition, DOER should consider folding incentives for EVs, including e-bikes, and residential charging stations under the Mass Save program brand to easily raise awareness for these initiatives.

### **Section 2.2 Strategy T6: *Stabilize Light-Duty VMT & Promote Alt Transportation Modes***

Reducing vehicle-miles-traveled (VMT) is perhaps the most important strategy to reduce GHG emissions from the transportation sector and the 2030 CECP falls short on the strategies and policies to address VMT and promote alternative transportation modes. The Commonwealth cannot just "stabilize VMT" -- we must reduce VMT on an annual basis through the CECP and other strategies. If we do not provide opportunities for Massachusetts residents to do less driving, we simply won't be able to meet our environmental and quality-of-life goals.

Under the status quo, VMT is projected to increase 21% from 2010-2030. By the 2030 CECP's own admission, "Since 1990, the number of vehicle-miles traveled (VMT) annually has steadily increased and passenger vehicle purchases have trended toward larger vehicles (e.g., sport utility vehicles) in the last decade. The increase in VMT and vehicle size has largely offset the emissions benefit from more stringent federal fuel efficiency standards." If we reduce VMT, it

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<sup>6</sup> Ibid, pg. 26. <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.

makes all of our goals on transforming our fleets and greening our grid easier to achieve, while also delivering substantial, lasting co-benefits in cost-effective ways. If we reduce VMT, it makes all of our goals on transforming our fleets and greening our grid easier to achieve, while also delivering substantial, lasting co-benefits in cost-effective ways. Measures to reduce VMT must be paired with efforts to accelerate the transition to electric vehicles. Both strategies will be critical.

We appreciate the clear goal to reduce commuter VMT per employee by 15% by 2030. To build on this, we suggest applying this goal to all trips, rather than just commutes. California has already adopted this same target of reducing VMT per capita by 15% by 2030. We must invest in a transportation system where residents can use public transit or active transportation for the 87% of daily trips that are not commutes.

The Commonwealth needs to include land use and housing policies in a holistic approach to the transportation sector. This involves including DHCD, in addition to EEA, MassDEP, and MassDOT in the coordinated approach to reducing VMT. The development of housing in the right locations at affordable cost levels is a critical component of a state-wide approach to reducing VMT. Shifting land use patterns and improving multi-modal options has many co-benefits, including improving economic mobility, reducing commute times, improving public health outcomes by reducing air pollution and traffic fatalities, and conserving open space, which is necessary for carbon sequestration to be a successful mitigation tool. Mode-shift should be an explicit goal for the Commonwealth.

Telecommuting is not a policy solution. Promoting "telecommuting" would exacerbate inequities, resulting in higher-income office workers staying home during the workday, and lower-income service and retail workers needing to commute via car or on transit that would be even harder to fund due to reduced ridership. Furthermore, many workers who expect to continue telecommuting after the public health restrictions are lifted still anticipate returning to the office at least some of the time. We need more frequent public transit service that is able to accommodate increasingly flexible commuting patterns if we want to prevent the return of a congestion crisis.

MassDOT should establish a plan and target date to implement congestion or road pricing in Greater Boston. [Studies](#) of cities and regions around the world show that congestion pricing reduces car traffic and congestion in some cases up to 30%. Congestion pricing in Massachusetts could provide a consistent source of funding for commuter rail, bus, and subway service, and improve quality of life for residents. Based on an analysis of expected revenue loss from the gas tax and EV uptake, the need to establish a plan and target date to implement road pricing is only more important the longer it takes to accomplish this. The Commission on the Future of Transportation also recommends that "MassDOT should consider various congestion pricing

strategies that compel changes in default transportation behaviors on corridors that are or could be served by transit and/or new mobility options. In order to provide an economic market signal, MassDOT should consider and pilot congestion-pricing strategies.”<sup>7</sup> The Legislature recently passed a roadway and congestion pricing commission as part of the transportation bond bill that was vetoed by Governor Baker that would have started this process. Out of the ten most populous metropolitan areas in the country, metro Boston is the *only one* that does not use some form of time of day roadway pricing to control congestion.

Thank you for you for allowing us to comment on the Draft 2030 CECP and we hope you will incorporate our recommendations to set targets for fleet electrification, implement congestion pricing, expand incentives for EV infrastructure and e-bikes, reduce rather than stabilize VMT, coordinate between agencies to implement TOD projects, and invest and promote public transportation.

Signed,

Rick Dimino, President & CEO, A Better City  
Jordan Stutt, Carbon Programs Director, Acadia Center  
Jennifer Benson, President, The Alliance for Business Leadership  
Becca Wolfson, Executive Director, Boston Cyclists Union  
John Carlson, State Policy Manager, Ceres  
Peter Kirby, Board Chair, Climate XChange  
Nancy Goodman, VP for Policy, Environmental League of Massachusetts  
Larry Chretien, Green Energy Consumers Alliance  
Julia Wallerice, Boston Program Manager, Institute for Transportation and Development Policy  
Elizabeth Foster-Nolan, Co-President, League of Women Voters of Massachusetts  
Stacy Thompson, Executive Director, LivableStreets Alliance  
John Stout, Transportation Advocate, MASSPIRG  
Lizzi Weyant, Director of Government Affairs, Metropolitan Area Planning Council  
Veena Dharmaraj, Director of Transportation, Sierra Club Massachusetts  
Karen Christensen, President, Train Campaign | Barrington Institute  
Chris Dempsey, Director, Transportation for Massachusetts  
Jack Spence, Transportation Working Group of 350MA  
Wendy Landman, Senior Policy Advisor, WalkBoston  
Anne Miller, Western Massachusetts Rail Coalition

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<sup>7</sup> Ibid, pg 42. <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.



March 22, 2021

Dear Governor Baker & Secretary Theoharides,

As a non-profit organization working to support community climate engagement, MassEnergize respectfully submits the below comments on the state's interim Clean Energy and Climate Plan (2030 CECP).

As background, MassEnergize develops infrastructure that helps any local organizer (grassroots group, local government, school, religious organization, etc.) to engage residents and businesses to take action on climate change. We provide software and implementation tools, convene a community of practice and collect data to improve campaigns and inform local policy. In just one year, MassEnergize has helped leaders in four communities to engage over 5,230 households, who have taken over 10,300 actions, resulting in over 764 tons of avoided CO2 emissions, equivalent to avoiding 1.7 million miles driven by an average passenger car and 764,000 pounds of coal burned.

**Overall we support the 2030 CECP** and the administration's commitment to leading the nation in addressing climate change with the sector specific goals in the 2030 CECP. Sector specific plans and goals are critical if we are to make progress. We suggest several additions to the plan that further engage and support communities, who will be vital contributors to these goals.

**Support municipal and community-based efforts and leadership.** To achieve the ambitious goals in the buildings and transportation sectors, the state will need to harness existing community networks to engage the public. Both community-based organizations and municipalities have shown climate leadership and have developed networks to support efforts to decarbonize our homes and vehicles.

Municipalities and community-based organizations are constrained by capacity, primarily due to a lack of funding, yet these groups can make a significant difference in our climate efforts. The Solarize and Heat Smart programs, for example, demonstrated a 3-fold increased uptake of solar and heat pumps through their community-based efforts. Importantly, different municipalities and community-based organizations will require different levels of support to carry out some of the work outlined in the 2030 CECP. We urge the administration to convene an advisory committee of municipal and community based organizations to help structure programs, provide input into evaluation efforts, and facilitate communication and allocate funds to support community level efforts to reduce greenhouse gas emissions from both municipal operations and, more importantly, local residential households and businesses.



Funding for municipalities is essential to a) assist disadvantaged and rural communities in hiring a sustainability coordinator, b) support and implement any expanded stretch code, and c) lead by example by electrifying public buildings and vehicles. Funding for community-based organizations would a) reach an increased number and more diverse set of residents and small businesses, and b) support innovative models such as household-level decarbonization planning and coaching.

**Center equity in the 2030 CECP.** Environmental justice communities, low income, and energy burdened residents must be prioritized in the state’s work to cut emissions. Adoption of new technologies is expensive, and most current incentive programs exclude or are inaccessible for low income residents and their communities. This discrepancy has become apparent in the lower Mass Save participation rates by residents and businesses in environmental justice communities. Additionally, historically disadvantaged communities, such as the Gateway Cities, have joined community-changing programs like the Green Communities program at lower rates and/or at later dates than more affluent communities.

As we expand our efforts to address climate change by beginning to more systematically address transportation, we run the risk of similarly excluding these Black, Brown, and Indigenous communities. Investments in electric transportation should be prioritized for these communities that have disproportionately high amounts of pollution and suffer higher rates of related diseases. It is imperative that Massachusetts expand and electrify public transit while maintaining or eliminating rates and fares, invest in electric charging stations at public housing and low-income neighborhoods, design programs to bring electric vehicles preferentially to disadvantaged communities, and electrify school buses.

**Improve equity and progress through expanded data access.** Building upon the comments above, we have seen that different communities require different services. In the absence of data pertaining to specific communities’ needs, questions such as equity in the Mass Save program remain as anecdotes for years before a study provides conclusive data. To advance our efforts, we need publicly accessible data at the community level that allows us to know: Mass Save audit, weatherization, heating equipment and heat pump measures at the street and measure level, electric vehicle registrations, solar installations, public transit data, and methane leaks from the natural gas distribution network. Ensuring such data are accessible to all will help communities to develop and evaluate engagement efforts, track progress and much more. To truly empower community-based organizations and municipalities the data must include greenhouse gas emissions.



# Testimony before the United States Senate Committee on Energy and Natural Resources

For a hearing to examine the reliability, resiliency, and affordability of electric service in the United States amid the changing energy mix and extreme weather events

Written statement submitted by:

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March 11, 2021

Good morning Chairman Manchin, Ranking Member Barrasso, and members of the Committee. I am grateful to the Committee for inviting my testimony, and for your willingness to hear from someone who is neither a grid operator nor an electric industry participant, but someone whose perspective has been shaped by two decades of research, writing, and action motivated by a concern for necessary improvements in the reliability, affordability and environmental sustainability of electric service.

Congress took questions relating to the security of America's electricity supply seriously before more than a dozen states experienced energy shortages last month, but those events make this hearing all the more urgent. In 2012, 2017, and 2021 the National Academies of Science and Engineering published three separate reports on threats to the grid, resilience, and the future of electricity.<sup>1</sup> In its 2017 report, the Academies warned that U.S. electrical grids were increasingly "complex and vulnerable."<sup>2</sup>

Over the last 25 years, increasingly decentralized electricity generation in restructured electricity markets, along with growth in the number of regulatory institutions, has resulted in "divergent interests of federal, state, regional and local authorities," wrote the Academies in the 2021 report. Electricity experts are not able to clearly answer the question, "who is in charge of planning, developing and ensuring the integrity of the future power system?"<sup>3</sup> The Federal Energy Regulatory Commission and the North American Electric Reliability Corporation are tasked to ensure electrical grid reliability and resilience. However, the Academies noted, "they too face short-term pressures and fiscal constraints."<sup>4</sup>

Meanwhile, many experts see in recent trends an inevitable transition away from coal and nuclear power plants, designed to function as baseload capacity, toward variable renewable energy sources with just-in-time natural gas back-up. The price of solar panels and wind turbines has declined 75 percent and 25 percent, respectively, since 2011.<sup>5</sup> The U.S. Energy Information Administration ("EIA") estimates renewables will be a larger source of electricity than natural gas in the United States by 2050. In that same time, EIA projects renewable electricity will rise from 28 percent to 50 percent of global generation.<sup>6</sup>

But events in mid-February throughout the center of the country, including Texas, and last summer in California, suggest that attempting to replace nuclear plants with variable renewable energy sources could make electricity grids less resilient. While energy sources across all categories failed in mid-February, they didn't all fail equally. The capacity factors for nuclear, natural gas, coal, and wind in Texas during the four days of load shedding during the cold snap were 79 percent, 55 percent, 58 percent, and 14 percent, respectively.<sup>7</sup>

Nuclear plants are among the most reliable components of America's power grids. Nuclear plants operate as a national fleet at 94 percent annual capacity factor, thanks to tightly choreographed refueling operations that barely interrupt eighteen-month continuous uptime at most facilities.<sup>8</sup> The hardening required of nuclear plants first in response to 9/11 and then in response to the loss of Fukushima Daiichi in 2011 has further ensured their contribution to reliability, resiliency, and affordability.<sup>9</sup>

Although Texas lost one of four of its nuclear reactors after cold water affected a sensor, automatically shutting down the reactor, it returned to service within 36 hours, and thus in time to

help end the power cuts. Meanwhile, nuclear reactors in other cold snap states, Nebraska, Kansas, Arkansas, Missouri, Illinois, Minnesota, Wisconsin, Ohio, and Michigan, operated normally.<sup>10</sup>

Even if all Texas wind turbines had been winterized, it is unlikely that they would have contributed significantly to electricity supply because wind speeds in cold snaps are so low. It is for that reason that grid operators do not rely on wind turbines to provide more than trace amounts of power during those periods. And, indeed, while wind turbines north of Texas functioned more or less as intended, during the cold snap, they produced very little power for their grids.<sup>11</sup>

Part of the reason for inadequate in-state electricity supply in California last August was that state regulators had closed in-state baseload power plants. "People wonder how we made it through the heat wave of 2006," said the CEO of California's grid operator, CAISO, at the time. "The answer is that there was a lot more generating capacity in 2006 than in 2020.... We had San Onofre [nuclear plant] of 2,200 megawatts, and a number of other plants, totaling thousands of megawatts not there today."<sup>12</sup>

Electricity lost from the closure of California's San Onofre nuclear plant undermined electricity affordability as well as reliability. It was mostly replaced by electricity from natural gas, which raised the costs of generating electricity by \$350 million.<sup>13</sup>

California regulators in 2020 over-estimated the contribution they could reasonably expect from renewables. "The situation could have been avoided," said the CEO of CAISO. "For many years we have pointed out that there was inadequate supply after electricity from solar has left the peak. We have indicated in filing after filing after filing that procurement needed to be fixed. We have told regulators over and over that more should be contracted for. That was rebuffed. And here we are."<sup>14</sup>

Texas and California show that policymakers and regulators have struggled to manage the grid's high and rising level of complexity, with troubling consequences. Are we so confident that reducing energy diversity while pushing more variable energy onto electrical grids is the best path forward in terms of reliability, affordability, and sustainability?

### **Affordability and Sustainability: Lessons from Around the World**

California offers a relevant real-world picture of the impacts of significantly expanding reliance on variable renewable energy sources while reducing reliance on nuclear energy. California significantly expanded its use of renewable energy starting in 2011. That year, California generated 13.5 percent of its in-state electricity from all non-hydroelectric renewables. In 2020, California generated 39 percent of its in-state electricity from them.<sup>15</sup> As a consequence of purchasing and integrating variable renewable energy onto its grid, California's electricity prices rose 39 percent in the decade from 2011 to today, despite persistently-low-priced natural gas, which made doing so easier and more affordable.<sup>16</sup>

California retail electricity prices rose eight times faster than the nationwide average between 2011 and 2020. Today, California households pay 55 percent more than the national average per

kilowatt-hour of electricity. In 2020, California's electricity prices rose 7.5 percent, compared to just 0.25 percent in the other 49 states.<sup>17</sup>

The impact of variable renewable energy sources on electricity prices can be seen in the more than two-dozen states that have had in place renewable energy mandates. "Cumulatively," wrote the authors of a University of Chicago report on the impact of variable renewables on electricity prices, "consumers in the twenty-nine states studied paid \$125.2 billion more for electricity than they would have in the absence of the policy." The study authors concluded that higher variability was the main driver of higher costs.<sup>18</sup>

With France and Germany, we can compare two major (sixth and fourth largest) economies, which are highly proximate geographically and at similarly high levels of economic development, on a decades-long time scale.<sup>19</sup> France spends just over half as much per kilowatt-hour for electricity that produces one-tenth of the carbon emissions of German electricity.<sup>20</sup> Electricity prices in Germany have risen 50 percent in the 15 years since 2007.<sup>21</sup> In 2019, German electricity prices were 45 percent higher than the European average.<sup>22</sup>

A study published in late 2019 found that Germany's nuclear phase-out is costing its citizens \$12 billion per year.<sup>23</sup> In response to Fukushima, the Japanese government shut down its nuclear plants and the cost of electricity went up. As a result, 1,280 people died from cold from unaffordable electrical power, researchers calculate, between 2011 and 2014.<sup>24</sup>

Some of the cost of variable renewable energy sources comes in the form of the transmission lines they require. With funding from Bill Gates, the analytical group Breakthrough Energy Sciences last week estimated the U.S. could reduce carbon emissions 42 percent and generate 70 percent of its electricity from carbon-free sources by 2030. But Breakthrough Energy calculated that the cost of new transmission, distribution, and storage would be \$1.5 trillion.<sup>25</sup>

And that amount does not include the costs associated with local and state political opposition. In their 2021 report, the Academies noted that while variable renewable energy sources like solar and wind appear to be popular in public opinion surveys, "political uncertainties concern the durability of policy support for renewables when deployed at large scales, especially where it is highly visible and potentially conflicts with other land uses."<sup>26</sup>

Local community and environmental opposition to transmission is a national and international phenomenon. A federal judge last year blocked a transmission line proposed to be built straight through whooping crane habitat in Nebraska because transmission lines are the number one cause of mortality among whooping cranes.<sup>27</sup> Of the 7,700 new kilometers of transmission lines Germany needed for the energy transition, only eight percent have been built. Community and conservationist resistance has been a significant factor.<sup>28</sup>

The land requirements of industrial renewable energy projects are two orders of magnitude larger than those of nuclear and natural gas plants. Industrial solar and wind projects require between 300 and 400 times more land than nuclear plants.<sup>29</sup> If the United States were to try to generate all of the energy it uses with renewables, 25 percent to 50 percent of its land would be required, according to the best-available study by a leading energy analyst and advisor to Bill Gates.<sup>30</sup> By contrast, today's energy system requires just 0.5 percent of land in the United States.<sup>31</sup>

Many energy experts are enthusiastic about solar panels, but new information has called the social and ethical value of the technology into question. The average annual pay of a power plant operator is \$79,400 per year versus \$46,900 for a solar installer, according to Bureau of Labor Statistics data analyzed by NBC News.<sup>32</sup> That appears to be in part because so much of the economic value of solar panels is at the place of manufacture, not installation.<sup>33</sup>

As troubling is evidence that cost declines of solar panels, most of which are made in China, appear to stem from the involuntary labor of a persecuted Muslim minority, the Uighurs. In January the U.S. State Department deemed China's treatment of the Uighurs to be genocide.<sup>34</sup>

Ninety-five percent of the global solar panel market contains Xinjiang silicon. While there has been talk of bringing solar manufacturing to the U.S. and Europe, doing so would significantly increase prices.<sup>35</sup> There is proposed Senate legislation to ban imports from Xinjiang unless they are certified, and similar legislation is introduced into the House. But given the fungible nature of silicon, some fear the Chinese government could evade such controls.<sup>36</sup>

And more decentralized electrical generation makes the grid more vulnerable. "We're adding a lot of stuff at the grid edge," said the lead author of the Academies' 2012, 2017, and 2021 reports, "and if I start building microgrids does that increase my potential vulnerability? The answer is, 'Yes, of course. The more complicated I make it, the more attack surfaces and, hence, the more possibilities of failure.'"<sup>37</sup>

### **The Costs of Maintaining Reliability With Variable Renewable Energies**

While the switch from nickel-cadmium to lithium-ion batteries allowed for the proliferation of cell phones, laptops, and other electric appliances, it has not allowed and will not allow for the cheap storage of the grid's electricity. One of the largest lithium battery storage centers in the world is in Escondido, California. But it can only store enough power for about twenty-four thousand American homes for four hours.<sup>38</sup>

And storage does not easily solve the problem of long-term, seasonal variability. In January and February of this year, Germany's renewables produced just two-thirds of the electricity they produced in January and February of 2020, despite a four percent increase in solar panel and wind turbine capacity, simply because of annual variability of wind and sun.<sup>39</sup>

Germany has only been able to manage the seasonal fluctuations from intermittent renewables by maintaining a large and diverse fleet of coal, natural gas, and nuclear power plants. Germany added 150 percent of its total capacity in coal, natural gas, and nuclear in the form of new wind and solar capacity, which was part of why Germany's electricity prices have risen to the highest levels in Europe.<sup>40</sup>

One study by a group of climate and energy scientists found that when taking into account continent-wide weather and seasonal variation, for the United States to be powered by solar and wind, while using batteries to ensure reliable power, the battery storage required would raise the cost to more than \$23 trillion.<sup>41</sup>

Most proponents of variable renewable energy thus look elsewhere for storage solutions. The most influential proposal for 100 percent renewable energy in the U.S. was created by a Stanford professor who relied on the conversion of existing hydroelectric dams into giant batteries.<sup>42</sup>

But in 2017, scientists writing in the *Proceedings of the National Academies of Science* observed that the 100 percent renewable proposal rested upon the assumption that we can increase the amount of power from U.S. hydroelectric dams ten-fold when, according to the Department of Energy, the real potential is just one percent of that. Without all that additional hydropower, the 100 percent renewables proposal does not work on its own terms.<sup>43</sup>

California is a world leader when it comes to renewables and has a major network of dams but hasn't converted them into batteries because you need the right kind of dams and reservoirs, and even then, it's an expensive retrofit. In addition, there are many other uses for the water that accumulates behind dams, namely irrigation and water supply for cities. Without large-scale ways to back up solar energy, California has had to block electricity coming from solar farms when it's extremely sunny, and pay neighboring states to take it, in order to avoid adding much energy on the grid during hours of peak solar production.<sup>44</sup>

Germany will have spent \$580 billion on renewables and related infrastructure by 2025, according to energy analysts at Bloomberg<sup>45</sup> and Germany generated 37.5 percent of its electricity from wind and solar in 2020, as compared to the 70 percent France generates from nuclear.<sup>46</sup> Had Germany invested the \$580 billion it's spending on renewables and their grid upgrades into new nuclear power plants instead, it could be generating 100 percent of its electricity from zero-emission sources and have sufficient zero-carbon electricity to power all of its cars and light trucks (if electrified) by 2025, as well.<sup>47</sup>

From this information we can gain a clearer picture of electric reliability, resiliency, and affordability. What tends to make electric grids more reliable, resilient, and affordable is the generation of electricity by a few large, efficient plants with the minimal amount necessary of wires and storage. What tends to make grids less reliant, resilient, and affordable is significantly increasing the number of power plants, wires, storage mechanisms, people, and organizations required for operating them.

### **Loss of Nuclear Plants Threatens Reliability, Affordability, and Sustainability**

The U.S. reduced its greenhouse gas emissions between 2000 and 2020 more than any other nation in history in absolute terms, according to preliminary analysis by the Rhodium Energy Group. U.S. greenhouse gas emissions in 2020 were 21 percent below 2005 levels, which is nearly a one-quarter larger reduction than that promised by the United States under the Copenhagen Accord target of a 17 percent reduction. Even without the pandemic, emissions would have declined 3 percent in 2021, Rhodium estimates.<sup>48</sup>

The premature closure of nuclear plants threatens reliability, resiliency, affordability, as well as America's reductions in greenhouse gases. Without state or federal action, the US will close twelve nuclear reactors by 2025, which constitute 10.5 gigawatts of highly-reliable, low-cost, and low-carbon

power.<sup>49</sup> Despite ratcheting regulations, the cost of operating America's nuclear plants fell from \$44.57 per megawatt-hour on average in 2012 to \$30.42 in 2019.<sup>50</sup>

But restructured wholesale electricity markets, low-priced natural gas, and subsidized variable renewable energy have undermined the economics of nuclear power plants, including those that prevented wider power outages during the recent cold snap. Those plants are Byron and Dresden in Illinois, Palisades in Michigan, Davis-Besse and Perry in Ohio, and Beaver Valley in Pennsylvania. If those nuclear plants are lost, grids may suffer from energy shortages during future heat waves or cold snaps.

The U.S. might achieve higher levels of electricity resiliency, reliability, affordability, and sustainability by reconsidering whether nuclear power plants are really so unattractive, and wholesale markets really so efficient.

In restructured markets, as more renewables are integrated into the system, the costs to keep reliable baseload power plants in service keep rising. In Texas, there was no mechanism to ensure that baseload plants were ready for the weather. As a result, many were in seasonal shutdown for repairs, or had not been winterized. In Germany, the government has had to resort to various mechanisms to prevent utilities from going bankrupt.<sup>51</sup>

Restructured electricity markets did not result in the oft-promised lower prices in California, Texas, or the U.S. as a whole.<sup>52</sup> And from 2010 to 2019, consumers from across the U.S. who purchased electricity from electricity retailers paid \$19.2 billion more than they would have had they purchased power from legacy utilities, according to a recent *Wall Street Journal* analysis.<sup>53</sup>

According to the Academies, the older model of regulated and vertically integrated electric utilities were better at taking a "longer-term perspective" that can take into account "broader societal benefits" than today's tangle of federal and state agencies, electric utilities, and power companies.<sup>54</sup>

While a significant amount of electricity policy is determined by the states, the Senate can play a constructive role in maintaining the reliability, resiliency, affordability, as well as the diversity and sustainability, of our grid by taking policy action now to keep operating the nuclear plants that have been critical to preventing power outages in recent years.

Thank you again for the opportunity to testify and I look forward to your questions.



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<sup>1</sup> National Academies of Sciences, Engineering, and Medicine. 2012. *Terrorism and the Electric Power*

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## MA CECP 2030 – Comments regarding Offshore Wind

We submit these comments in response to the interim *MA Clean Energy and Climate Plan for 2030* (“2030 CECP”), released for public comment by the Executive Office of Energy and Environmental Affairs on December 30, 2020. For this response, we have assembled a team of Tufts University students and faculty mentors with expertise in civil engineering, environmental engineering, electrical engineering, and energy policy to address questions related to near- and long-term planning for offshore wind energy. As a student led team, our goal is to provide an impartial perspective on technical and policy considerations. It is a privilege to be able to submit our comments and concerns to you today.

We would first like to acknowledge the 2030 CECP’s assessment that offshore wind is fundamental to Massachusetts’ energy transition. We agree with the critical assertion from the 2050 Roadmap that the 2020’s should “*include a balanced clean energy portfolio anchored by significant offshore wind resources,*” along with improvements to transmission, electrification, and cost reduction. We also note that the 2030 CECP anticipates offshore wind “*to be the primary source of electricity*” in New England, which boasts “*at least 31 GW of capacity... about half of which [would be] interconnected to land in and throughout Massachusetts.*” The electrification of buildings and transportation, which is spotlighted by the 2030 CECP as being the decade’s greatest source of emissions reductions, will further heighten the importance of access to clean energy, in particular offshore wind. Massachusetts has historically been a leader in offshore wind; we believe that the 2030 CECP could be strengthened in the following ways:

1. The existing offshore wind commitments (3.2 GW by 2030, according to the CECP) do not go far enough and the vague schedule for future offshore wind procurement (“*commence planning*” of an additional 6 GW by 2040) must be more ambitious and explicit.
2. The current plan delays much of the renewable energy buildout to the last decade, 2040-2050. This delay creates a risk that Massachusetts will not be able to procure offshore wind energy from the lease areas closest to its own shores, since the future availability of new lease areas from BOEM near New England is currently unknown.
3. We agree that simultaneous development of appropriate grid infrastructure is of the utmost importance, and we recommend advancing a *planned approach* for developing transmission infrastructure both onshore and offshore.
4. Moreover, this offshore wind must be procured within a policy and economic framework that prioritizes cooperation along the entire US east coast region and takes lessons from the European offshore wind experience.

**Comment 1: The CECP’s Offshore Wind Commitments must be more ambitious and more clear**

The 2030 CECP commits to “*fully executing the Commonwealth’s existing solar programs and offshore wind procurements*” and states that the “*EEA and its agencies will commence planning to procure, construct, and interconnect an additional 6 GW of offshore wind through to Massachusetts between 2030 and 2040.*” While a total of 9.2 GW of offshore wind capacity by 2040, as proposed by the CECP, may well be within range of multiple 2050 Report pathways (the “all options pathway” calls for around 9.8 GW by 2040), we believe that this plan delays dealing with a time sensitive issue (Jones, 2020). This is particularly so, because most 2050 Report pathways (including the “all options pathway”) back-load significant

expansion of renewable energy development towards the last decade, including offshore wind (44 TWh in 2040 to 75 TWh in 2050) and ground mounted solar (7.9 TWh in 2040 to 29.4 TWh in 2050) (Jones, 2020). We are concerned about this very rapid scaling up of capacity additions in the last decade before 2050. To mitigate those concerns and to allow for increased flexibility in the 2040s, we strongly recommend that offshore wind (procurement, solicitations, and construction) is made a higher priority in the 20s and 30s, particularly while there are lease areas available. Massachusetts is one of the most scientifically advanced and wealthy regions in the United States. We should not delay our offshore wind buildout nor pass on the opportunity to lead a global industry.

### **Comment 2: Ambiguous Procurement Schedule / Loss of Competitive Advantage**

The decisions made early in this decade will have a major impact on the shape of the future offshore wind market and supply chain in the US. If more offshore wind is not already procured in the late 2020s, there will be more uncertainty about the development of new offshore wind because the availability of nearby BOEM lease areas is uncertain. Depending on the sequencing of the next 6 GW of offshore wind for the 2030-2040 decade, the Massachusetts of today is committing itself to a very aggressive project ramp up. This aggressive ramp up will be complicated by the fact that other Northeastern states have been more aggressive in offshore wind commitments from 2020-2030 and have already procured a disproportionate amount of offshore wind from the nearby Offshore MA/RI Lease Areas.

Massachusetts has already begun to fall behind several of its Northeast neighbors in terms of offshore wind commitments and procurements. While MA has so far only committed to 3.2 GW of capacity by 2035, New York and New Jersey have committed to 9 GW and 7.5 GW by 2035. These ambitious commitments have already demonstrated the scarcity of existing federal lease areas. As a result of this scarcity, there is a real risk that New York state will continue to dip into the BOEM lease areas off the coasts of Rhode Island and Massachusetts, as it did with the South Fork, Sunrise Wind, and Beacon Wind projects. Based on numbers from the Tufts Power Systems and Markets research group, the current MA/RI lease areas have a total capacity of approximately 12 GW (assuming 12 MW turbines). Out of this 12 GW, 5.4 GW have already been procured by New England States and New York. In addition, RI and MA have scheduled solicitations in these lease areas for another 2.2 GW. Finally, while not yet scheduled for solicitation, CT will need approximately 1 more GW to meet its 2 GW offshore wind commitment by 2030. In light of these observations, the arithmetic is simple:

$$12 \text{ GW} - 5.4 \text{ GW} - 2.2 \text{ GW} - 1 \text{ GW} = 3.4 \text{ GW}$$

There are approximately 3.4 GW of offshore wind capacity available in the current Offshore RI/MA Lease Areas that are not spoken for by a known state procurement, solicitation, or 2030/2035 target. One possibility is that NY will continue to procure from these lease areas, since NY currently needs an additional 4.7 GW of offshore wind to meet its 2035 goal. This would present a major challenge for MA, as there are currently no other nearby lease areas from which MA could procure offshore wind. MA would instead need to procure offshore wind from call areas in the New York Bight or other lease areas yet to be determined.

We agree that BOEM needs to intensify its review processes in order to deliver the full energy transition, and we hope that the Commonwealth is able to work directly with BOEM to identify new lease areas. Nevertheless, it is our opinion that the most direct way to address federal leasing shortages in the short term would be to plan out additional solicitations for offshore wind lease areas that are currently

unclaimed. The Commonwealth already knows it will need to procure these areas, however, it risks losing them due to inaction. We believe NJ's procurement schedule presents a compelling model. In NJ, the state set out a schedule for offshore wind solicitations every two years from 2021-2029. In addition to setting a regular schedule for procurements, Massachusetts would need to increase its 2035 goal to a level in line with its roadmaps (i.e. about 6 GW total capacity built by 2035 in the All Options Pathway) (Jones, 2020). This increased MA goal combined with the CT and RI goals would bring the New England region to approximately 9 GW by 2035. In addition to reducing the reliance on unknown lease areas, this level of commitment would also help keep the New England region competitive as a hub for offshore wind when compared to NY and NJ.

### **Comment 3: Offshore Transmission Infrastructure**

The CECP also states that "*the Commonwealth of Massachusetts will work with other New England states, federal agencies, and local municipalities to **address onshore siting of transmission upgrades and coordinate procurements that support the region's ambitious clean energy goals***". We appreciate that MA recognizes a significant need for transmission upgrades. A 2019 ISO-NE study found that the current grid would allow for between 5.2 and 7 GW of offshore wind to connect through Massachusetts (ISO New England 2019). Clearly, more work needs to be done for transmission to meet the 9.2 GW by 2040 proposed in the CECP. We would like to respond specifically to the word "onshore" because this fails to consider the promising prospect of offshore networked transmission.

Anbaric Development Partners, a Massachusetts transmission development company (2020), commissioned the Brattle Study that concluded that creating an offshore grid could save over a billion dollars in onshore grid upgrades, reduce the electrical losses, and reduce the amount of undersea cable needed (Pfeifenberger, 2020). The gist of the conclusions is supported by National Grid's study about the offshore grid in the UK (National Grid ESO, 2020). This report provides a vision for how the Northeast and the entire U.S. East Coast could collaborate to achieve a reliable, resilient, and environmentally responsible offshore grid. This is another area where the solicitation schedule for procurement is critical because a strong project pipeline and state commitments will be needed to develop this infrastructure. A New England offshore wind grid cannot be planned and built if half of the energy in the MA/RI lease areas is going to NY.

### **Comment 4: Policy Framework for Offshore Wind Procurements**

With a speed and effectiveness that was unimaginable even five years ago, the Federal government has leased offshore wind sites, and the states have designed procurement processes for offshore wind generators. As result of these steps, the public sector now finds itself at an inflection point in guiding the public impact of the U.S. offshore wind industry. There are technical, economic, environmental, and social choices being made that will set the future direction of offshore wind for years to come. The Northeast is an interconnected energy and economic region, and the geography of the offshore wind lease areas highlights this interconnection. The offshore wind farms that will be built in the US are not just an extension of existing projects in Europe. The new projects in the US will be pushing boundaries for turbine size, water depth, and size just like the new wind farms being developed in Europe. The offshore wind industry is highly developed, sophisticated, and led by European energy giants with roots and experience in the fossil fuel industries. There are public policy lessons to be learned from Europe about accessing sites, building supply chains, and designing grid integration.

One of the critical and immediate vectors for public decision making is whether to approach offshore wind within a framework of regional cooperation or competition. New England has multiple energy decision making frameworks in place, driven by its grid connections in ISO-NE, that point to a cooperative approach. Outreach to other parts of the Northeast and the Mid-Atlantic exist and while these cooperative bonds are less well-developed, the U.S. East Coast consensus is that offshore wind needs to be developed at scale. Based on lessons from Europe, cooperation in terms of price, jobs, and environment is essential for the greater public good. Now is the time for the U.S. to establish this cooperative framework, and with over 20 years of experience in modern electricity markets, offshore wind development, and greenhouse gas reductions, Massachusetts is well-positioned to lead the way.

Many of these matters clearly impact the broader goals of the environment, jobs, and social equity that are central to public policy, but are not brought to the fore by stakeholders acting within the current project-by-project competitive framework. By the end of this calendar year, we recommend developing a new policy framework that articulates that emphasizes the following points:

- i. Regional collaboration and effective use of federal stimulus and infrastructure resources;
- ii. Timely planning and build-out of the onshore and offshore grids;
- iii. U.S. jobs, preferably in the Northeast;
- iv. Appropriate protections of the U.S. offshore and onshore environments;
- v. Appropriate stewardship of existing coastal ports and points of interconnection (POIs);
- vi. Justice and equity in the energy transition;
- vii. Clear, scholarly scientific information, that the public can understand; and
- viii. A vision for how Massachusetts will help lead our global decarbonization mission.

## **Conclusion**

Our comments are intended to strengthen MA to reach these goals. Massachusetts must play to its strengths as a leader in offshore wind and develop its own plans in the context of the larger U.S. and global energy transitions. We must recognize the scale of the task at hand, seize the moment with the help of federal infrastructure stimulus, and aim to reach our goals early, so that we can lead the rest of the world to a successful net-zero 2050. The CECP should: i) be more ambitious with its offshore wind commitments, ii) set a clear procurement schedule to avoid losing out on scarce BOEM lease areas, and iii) consider offshore grid infrastructure. Massachusetts has much to gain by demonstrating leadership that continues to inspire our region, our country, and the world.



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March 22, 2021

Kathleen A. Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

Dear Secretary Theoharides,

I am writing to provide comments on the state's interim Clean Energy and Climate Plan (CECP) for 2030. Climate change is a threat to Massachusetts' competitiveness, its residents, and its business community. As such, the state's goal to reach net-zero emissions is both necessary and important, and the CECP includes substantial proposals to meet this target. The Chamber's comments are organized first by sector and then policy strategy. In drafting the final CECP, we urge you to prioritize congestion reduction alongside decarbonization strategies in the transportation sector; account for the implementation challenges posed by the strategies for reducing building sector emissions; and focus on infrastructure modernization and distribution grid reliability while decarbonizing the electricity generation sector.

## **Transforming our Transportation System**

### *Strategies T1 through T5: Invest in Low and Zero Emission Vehicles*

Strategies T1 through T5 largely focus on expanding access to low or zero emission vehicles (ZEV) via the Transportation and Climate Initiative Program (TCI-P) and other strategies, and the deployment of an electric vehicle (EV) charging infrastructure network. The transition to ZEVs is necessary to reduce GHG emissions in the transportation sector. In addition to ZEVs, the state must have robust public transit available as an alternative mode of transportation.

The CECP should include ways to maintain and modernize the state's public transit infrastructure because doing so will provide dual benefits of reduced emissions and congestion. The first recommendation in the Commission on the Future of Transportation's report prioritizes investment in public transit for good reason: "public transit can reduce pollution and is key to meeting the Commonwealth's GHG reduction and related climate goals."<sup>1</sup> High-frequency and high-capacity public transportation is an efficient mode of transit because it moves numerous people along high-travel corridors.

But for public transit to effectively reduce GHG emissions and congestion, it must retain and attract new riders.<sup>2</sup> This can only be done through new investment and thoughtful planning in our current system to make it a competitive mode of transit. We urge you to include mechanisms in the CECP – such as a higher gas tax or the expansion of transportation network company (TNC) fees – to supplement current public transit revenue sources. Using this new revenue on targeted investments will allow the state to provide commuters with a robust public transit system that can serve as a reliable alternative to automobiles.

In addition to needed revenues, the Chamber continues to support project delivery reforms at MassDOT and the MBTA. The transportation bond bill enacted last session included useful tools, like the expansion of job order contracting, but more should be done to provide flexibility in project delivery. For this reason, [the Chamber supports many of the outside sections](#) Governor Baker included in his fiscal year 2022 budget.

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<sup>1</sup> Commission on the Future of Transportation, 2018, [Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1](#), page 37.

<sup>2</sup> Commission on the Future of Transportation, 2018, [Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1](#), page 36.

### *Strategy T6: Stabilize Light-Duty VMT & Promote Alternative Transportation Modes*

Strategy T6 seeks to stabilize vehicle miles traveled (VMT) through Smart Growth policies and by exploring options to reduce average commuted VMT per employee by 15 percent by 2030. The Chamber supports Smart Growth policies to reduce transportation emissions. At the same time, we believe a more robust plan for reducing VMT, along with new policy mechanisms, is required to reduce emissions and roadway congestion.

New Smart Growth policies, such as mixed-used and high-density zoning, can reduce transportation emissions. Transit-oriented developments and additional zoning reforms near transportation and commercial centers will also provide much-needed housing for the state's growing workforce.

Strategy T6 also outlines plans to explore options to incentivize or require reductions in single-occupancy vehicle commuting, but rather than "explore" it should commit to creating a clear and comprehensive VMT reduction plan. By exploring options to reduce VMT, Strategy T6 is a necessary first step toward developing this more robust plan. Upon completing the exploratory efforts in Strategy T6, the CECP should require the state to develop a VMT reduction plan.

Strategy T6 focuses on commuting VMT, but commuting is one portion of all vehicular travel. Further, by seeking to stabilize rather than reduce VMT, the state misses an opportunity to further reduce emissions and congestion on our roads. To meet the dual goal of reduced emissions and congestion, the state should strive to lower all VMT through a robust public transit system.

One tool for reducing VMT that the CECP should incorporate is a special commission on congestion and roadway pricing. A proposal to establish a commission on roadway and congestion pricing currently sits before the Legislature and could inform a strategy in the CECP.<sup>3</sup> In developing other policy strategies, the Chamber prefers mechanisms that incentivize VMT reductions and transportation mode shifts over stringent mandates and requirements.

Finally, in recommending a reduction in commuting VMT, Strategy T6 relies on the assumption that telework is a viable and permanent alternative to a daily commute that can help reduce VMT.<sup>4</sup> For several reasons, we caution against using this assumption.

First, many small businesses do not have the luxury of remote work. Consistently throughout the pandemic, over 50 percent of Massachusetts' small businesses did not have paid employees working from home.<sup>5</sup> Second, many of the state's fastest growing industries, like health care, require in-person interactions. Fast-growing occupations within health care include personal care aids, registered nurses, and nursing assistants, all of which require in-person interactions each day.<sup>6</sup> Finally, expanded telework threatens the Commonwealth's talent advantage over other states. A talent pool no longer restricted by physical proximity means employers do not need to locate in Massachusetts to access our talent and current employees are free to relocate to lower-cost states.

## **Transforming our Buildings**

### *Strategy B1: Avoid Lock-In of Building Systems That Are Not 2050-Compliant*

Strategy B1 includes adopting a new high-performance stretch energy code that municipalities can opt into in 2022 and becomes mandatory statewide no later than the start of 2028. In a [letter to legislators earlier this year](#), the Chamber supported Governor Baker's amendments to the proposed stretch energy code outlined in Section 31 of S.9, *An Act creating a next-generation roadmap for Massachusetts climate*

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<sup>3</sup> Section 30 of SD2315, *An Act creating a New Deal for Transportation in the Commonwealth*

<sup>4</sup> Executive Office of Energy and Environmental Affairs, 2020, Interim [Clean Energy and Climate Plan for 2030](#), page 25.

<sup>5</sup> U.S. Census Bureau, [Small Business Pulse Survey](#), Phases 2 and 3.

<sup>6</sup> Massachusetts Department of Unemployment Assistance, [Long-Term Occupation Projections](#) (2018-2028) and [Long-Term Industry Projections](#) (2018-2028).

*policy*. While we support the changes proposed by the Governor, several challenges will need to be addressed during the rulemaking process to ensure the state develops and implements a financially feasible stretch code in a predictable manner with broad input from stakeholders. Challenges include:

- **Scope and Implementation:** The proposed stretch code must be technologically and financially feasible. This particularly is true for complex buildings, such as hospitals or laboratories. A tiered implementation plan based on building uses and typologies should balance decarbonization with the reality that buildings serve different purposes, and some will require more flexibility in achieving emissions reductions.
- **Timing:** To provide greater predictability to developers and builders for when municipalities adopt the stretch energy code, the state should include a twelve-month concurrency period.
- **Stakeholder Process:** Significant stakeholder involvement is needed prior to developing an updated stretch code. It is imperative that the state proactively includes real estate developers, public utilities, and the business community in its extensive development and review process to ensure measures in the stretch code are financially and technologically feasible.

### *Strategy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions*

Strategy B3 proposes a Commission and Task Force on Clean Heat and a long-term declining cap on heating fuel emissions. The Chamber urges the state to incorporate the perspectives of building owners and tenants in the new Commission, include mechanisms to incentivize businesses to adopt clean heat solutions, and facilitate implementation by ensuring municipal alignment to the state's goals.

The CECP proposes a Commission and Task Force on Clean Heat tasked with proposing statutory, regulatory, and financing mechanisms for developing reliable and affordable clean heat solutions. As the CECP recognizes, "not every building in Massachusetts can currently be cost-effectively electrified."<sup>7</sup> Because financial and technological challenges persist, the Chamber urges the Commission's and Task Force's charge to include methods for incentivizing building owners to reduce heating emissions. Encouraging businesses, rather than penalizing them, to reduce heating emissions is economically beneficial to the state and promotes both business innovation and investment.

The CECP also tasks the Commission and Task Force with providing consultation on a new long-term heating fuel emissions cap. At a minimum, businesses and building owners from each of the state's major industries should be included on the Commission to assist in developing clean heat proposals. Businesses and building owners can provide an important perspective on the affordability and feasibility of emissions-reduction proposals. And while the CECP does not provide details on the proposed heating fuel emissions cap design, we urge you to emphasize the importance of technological and financial feasibility in any proposal.

Finally, in designing a heating fuel emissions cap and other emissions reductions strategies, the state must ensure policies and goals align across government levels. Business and building owners' efforts to cost-effectively reduce building emissions requires them to operate in a predictable regulatory environment with straightforward climate goals and strategies. Complex or conflicting state and municipal mandates will increase costs and hinder overall progress toward the statewide net-zero goal.

## **Transforming our Energy Supply**

### *Strategy E2: Develop and Coordinate Regional Planning and Markets*

Strategy E2 outlines Massachusetts' ongoing coordination with other New England states to realign the regional electricity market toward the state's efforts to expand clean energy resources. The Chamber supports the broad goal of incorporating clean energy resources into regional electricity market planning.

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<sup>7</sup> Executive Office of Energy and Environmental Affairs, 2020, Interim [Clean Energy and Climate Plan for 2030](#), page 32.



The state's ongoing efforts to modernize the wholesale electricity market via the New England States Committee on Electricity (NESCOE) can cost-effectively drive emissions reductions.

*Strategy E3: Align Attribute Markets with GWSA Compliance*

Strategy E3 describes planned efforts by EEA and DOER to review current mandates and requirements for purchasing clean energy by 2022. These standards include the renewable portfolio standard (RPS), solar carve-outs, the clean peak standard (CPS), and many others. To ensure these programs are carried out strategically and cost-effectively, the state also should consider ways to streamline or combine these policies during its review. Streamlining overlapping programs, such as the Clean Energy Standard (CES) and the RPS, will simplify regulatory compliance and facilitate emissions reductions among in-state generators.

*Strategy E6: Incorporate GWSA into Distribution-Level Policy Considerations*

Strategy E6 outlines EEA's intergovernmental work to ensure the state's distribution system is designed to maximize the Commonwealth's ability to achieve its 2050 net-zero goal. However, reliability and cost-effectiveness must also be prioritized alongside sustainability goals.

The CECP projects the state's electricity demand to more than double by 2050 due to parallel efforts to electrify the transportation and building sectors. Distribution grid reliability becomes even more important as the state increases its reliance on renewable, yet intermittent, energy resources and because it will become heavily dependent on electricity as its primary energy source.

The CECP recognizes that a balanced portfolio of energy sources requires reliable distributed energy resources (DERs), such as energy storage. Despite this, the CECP does not include a concrete proposal to promote energy storage. Although the recently enacted climate bill (S.9) requires the Department of Energy Resources (DOER) to study the feasibility of new and existing long-duration energy storage systems, more must be done to enhance the grid's reliability. We strongly encourage the state to include in the CECP innovative ways to incentivize ways to advance energy storage technology.

The state's growing dependence on electricity also necessitates more reliable energy infrastructure. The CECP should commit to enhancing and expanding our energy infrastructure – including substations, transmission lines, and EV charging stations – so that residents and businesses can continue to benefit from a reliable and clean electric grid.

The Chamber appreciates the state's steadfast commitment to combating climate change and look forward to being a continued resource as you refine the Commonwealth's plan.

Sincerely,

A handwritten signature in cursive script that reads 'James E. Rooney'.

James E. Rooney  
President and CEO



## LABORERS' NEW ENGLAND REGION ORGANIZING FUND

Re: Public Comment for Massachusetts Clean Energy and Climate Plan  
for 2030

### DELEGATES

VINCENT R. MASINO  
CHAIRMAN  
MICHAEL F. SABITONI  
TREASURER  
JOSEPH C. BONFIGLIO  
KEITH R. BROTHERS

### DIRECTOR

SCOTT GUSTAFSON

The Laborers' New England Region Organizing Fund (LNEROF) and the Massachusetts & Northern New England Laborers' District Council (MNELDC), affiliates of the Laborers' International Union of North America (LIUNA), vigorously support an all-of-the-above energy policy approach to secure our energy future while protecting the economy from high energy costs and lack of future reliability. Our 20 local unions, representing over 22,000 skilled construction craft laborers who build Massachusetts, support balanced policy efforts to address climate change challenges and energy needs.

The MNELDC is the leading labor union supporting responsible energy policy and we have worked collaboratively with the Massachusetts Coalition for Sustainable Energy, a broad coalition of the leading business, trade, housing, and labor associations. We have also worked with environmental organizations in supporting carbon reduction targets and opportunities for renewable energy development.

A "just-transition" must be part of the Commonwealth's Clean Energy and Climate Plan for 2030. Before we can proceed, we need to completely understand what "a just transition" means for labor. In our opinion, a "just-transition" must contain strong labor standards that include protections for family-supporting union wages and benefits, procurement transparency and strong industry training standards. To date the "green economy" has failed to address the above-mentioned conditions, creating a low road energy industry, leaving out the hardworking union members who have relied on good energy jobs for decades to provide for their families.

The transition and the policies needed must be balanced and comprehensive, inclusive of natural gas, as we strive to achieve carbon reduction targets and ensuring affordable energy costs. Fossil fuels, a necessary bridge fuel source, will provide much of the energy we need in the decades to come and are important components of the "all-of-the-above" approach. Currently, the skilled jobs found in the fossil fuel construction industry are family-supporting with access to healthcare, pensions, and training opportunities.

All policy and legislative efforts must be inclusive of our members currently in fossil fuel jobs, enabling a pathway into emerging careers with similar wage and benefit standards. It is our position that all policies addressing

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climate change, must include language that establishes wage standards, apprenticeship, health and safety, project labor and community benefit agreements.

Our members, as taxpayers, ratepayers and homeowners are the middle-class backbone of the Commonwealth. The ambitious goal of reducing carbon emissions in the building and transportation sector by 2030 must be equitable and consider the dramatic economic effects on hard-working families. Unintended consequences of this plan could increase energy costs and cause more expensive development, penalizing our members.

We respectfully request to be included in the development of the plan and look forward to an inclusive climate plan that achieves carbon emissions reduction and creates family-supporting jobs.



For a thriving New England

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March 22, 2021

VIA EMAIL & EEA [ONLINE PORTAL](#)

To: [gwsa@mass.gov](mailto:gwsa@mass.gov)

Kathleen Theoharides, Secretary  
Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Subject: Comments on Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides:

Conservation Law Foundation (“CLF”) appreciates the opportunity to provide comments on the Interim Clean Energy and Climate Plan for 2030 (“CECP”). These comments are submitted pursuant to the notice issued by the Executive Office of Energy and Environmental Affairs (“EEA”) on December 30, 2020.

The comments below are organized to match the structure of the CECP as closely as possible, with a summary table of CLF’s specific policy recommendations for each CECP chapter followed by written comments.

Please do not hesitate to contact us with any questions.

Sincerely,

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## Chapter 1. Overview

EEA has the opportunity and responsibility to integrate more precise language into the CECP that provides details about actions that will advance climate justice. Climate justice focuses on the root causes of climate change—human-made greenhouse gas emissions (“GHG”) and related pollution—and making systemic changes that are required to address unequal burdens on our communities and realign our economy with our natural systems. Unless justice, equity, and worker rights are central components of our equitable climate agenda in the CECP, the inequality of the carbon-based economy will be replicated in the new pollution-free economy.

### A. Add Additional Policies to Commit to Equity and Justice.

In Section 1.3 (Commitment to Equity) of the CECP, we request that EEA add the following policies:

- **Prioritize and Anchor Equity and Justice** to avoid further harm to populations most vulnerable to and most at risk from climate impacts, pollution, displacement, energy burden, and cost while prioritizing climate, environmental, energy, and health benefits to such populations. Establish enforceable protections against disparate impacts. Prioritize analysis of cumulative impacts, while reducing burdens and increasing benefits to environmental justice (“EJ”) populations.
- **Support a People-Centered Approach to Policy Making, Program Design, and Implementation**, providing for and ensuring broad-based stakeholder participation, input, and oversight. The interests of and people from populations most vulnerable to effects of climate change and most at risk of pollution, displacement, energy burden, and cost must be represented and influential in this process.
- **Take a Holistic Approach to Achieving Climate Goals/Net Zero by 2050/GWSA Compliance.** Recognize that EEA has an obligation to meet and/or achieve compliance with multiple laws, policies, and Executive Orders 552 and 569. Account for and accurately value co-benefits and health impacts of action, but also costs and risks associated with delay and inaction.

The above additions to Section 1.3 will indicate that all CECP strategies should be centered in equity and justice, and that they be respectfully developed and deployed with the input, feedback, leadership, and engagement of the communities most vulnerable to the effects of climate change and most at risk from pollution, displacement, energy burden, health impacts, and other systemic inequities. Further details about these recommendations are included in the Global Warming Solutions Act Implementation Advisory Committee (“IAC”) Climate Justice Working Group (“CJWG”) comments, to which CLF co-authored, signed, and submitted under separate cover along with a whitepaper from Applied Economics Clinic.<sup>1</sup>

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<sup>1</sup> Bryndis Woods and Elizabeth Stanton, “Initial Assessment of the Climate Justice Working Group’s Recommended Policy Priorities – Tracking Equity and Justice,” Applied Economics Clinic (March 2021), pages 11-14, *provided as an attachment to the CJWG comment letter.*

## B. Improve Community Engagement

The final CECP should include, within each sector, a directive for agencies to implement a robust public engagement process. We applaud EEA for offering virtual webinars with simultaneous language interpretation and translation of written materials. EEA should use the lessons learned from convening the Massachusetts 2050 Decarbonization Roadmap (“Roadmap”) and CECP webinars to ensure that future meetings about climate policy also are accessible to residents who speak Spanish, Cantonese, Mandarin, Portuguese, Haitian Creole, Arabic, Amharic, Vietnamese, and additional languages other than English.

In addition to ensuring language access, the CECP should include a commitment that community engagement will influence state decision-making. All state advisory committees should include representation from EJ populations. The Environmental Justice Advisory Council, created pursuant to state law,<sup>2</sup> should be routinely convened and invited to participate in decisions about transportation, electricity, buildings, nature-based solutions, development, and housing.

## C. Require Diverse Hiring and Workforce Development Practices Across All Sectors to Achieve Quality Jobs.

The CECP should add a commitment for agency staff to work with an independent advisory council to oversee job creation. The jobs created through procurement, infrastructure projects, and implementation of climate policies should create a pathway out of poverty, with family-sustaining wages and benefits. The contract opportunities should advance women-, people of color-, and veteran-owned businesses and incentivize domestic and local quality job creation that also benefit working class immigrants, people living with disabilities, and formerly incarcerated people. Funding should be allocated for programs that directly recruit, train, and retain those underrepresented in the workforce. Training should also be provided for workers who need to learn new skills to support the just transition away from fossil fuels to clean energy.

## D. Clarify Throughout the CECP Need for New Authority and Funding, and Set Clear Timelines.

The CECP should indicate throughout each chapter whether EEA has existing authority or needs new statutory authority to achieve each policy recommendation/strategy action (or commit to a timeline for doing so). The interim CECP contains vague language like “consider” incentives or “explore” policies. The CECP should include requirements (i.e., regulations; eligibility criteria and/or preferential scoring for grant funding) in the appropriate policy recommendation/strategy action. We encourage EEA to integrate timelines to commence each strategy.

The transition to a clean economy is about capital investment. The only funding sources identified in the CECP are the Transportation and Climate Initiative and the Volkswagen settlement. Additional funding will be essential to the just and equitable transition that we all desire. Low-income residents do not have the discretionary funds or credit to buy new cars, to

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<sup>2</sup> Exec. Order on Environmental Justice No. 552 (2014).

insulate their homes, or to upgrade heating systems, or are renters with no control. Furthermore, the interim CECP lacks mention of how EEA and its agencies will be funded to carry out their many new tasks. It will take sustained funding to implement the CECP. We recommend clarifying in each chapter whether the relevant agency can achieve the strategy actions with existing funding and staff or whether it needs additional funding and new sources of revenue and staff.

## Chapter 2: Transforming our Transportation Systems

The transportation sector is the largest contributor of GHG emissions in the Commonwealth and it is the area in which we must make the most improvement in the next nine years.

### Summary Table of CLF Transportation Sector Recommendations

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
<b>N/A, add a new Strategy</b>	Maintain and expand public transit, set deadlines to electrify public transportation throughout the Commonwealth, and implement a Low-Income Fare.	No legislative or regulatory amendments are required. Notwithstanding, legislative guidance regarding the timing and priority of electrification could best direct how capital funds are used by the Massachusetts Bay Transportation Authority (“MBTA”) and Regional Transit Authorities (“RTAs”).
<b>Section 2.2 Strategy T1: Cap Transportation Sector Emissions &amp; Invest in Clean Transportation Solutions</b>	Begin TCI-P public engagement process with environmental justice partners working with state officials; outline plan for how funds will be spent, and how to measure benefits to overburdened and underserved communities.	No legislative or regulatory amendments are required. Notwithstanding, legislative guidance regarding a unique fund for TCI-P proceeds will be valuable, along with raising the floor of the minimum contribution. We support bill <a href="#">HD3905</a> , <a href="#">SD2317</a> .
	Implement TCI-P Model Rule.	Regulatory amendments are required.
	Require air pollution reduction targets for black carbon, NOx, and ultrafine particulate matter.	Legislation is not required; regulatory amendments are necessary. We support bill <a href="#">HD2696</a> , <a href="#">SD1742</a> .
	Need policy about biofuels to ensure no disparate impacts regarding transportation or storage of ethanol at fuel rack terminals.	Legislation is not required; regulations outlining details to limit transportation options would help.
<b>Section 2.2 Strategy T2: Implement Coordinated</b>	Support plan to adopt CA rules for Advanced Clean Cars II and Advanced Clean Fleets rule.	Begin process to implement CA standards through regulatory action in 310 CMR 60.00.

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
<p><i>Advanced Clean Vehicle Emissions &amp; Sales Standards</i></p>	<p>Prioritize electric buses first and then move to heavy-duty trucks.</p>	<p>Set fleet electrification targets via legislation and require regulatory amendments to ensure additional electric vehicle supply equipment.</p>
	<p>Establish target dates for fleets and individual vehicles:</p> <ol style="list-style-type: none"> <li>1. we need 50 percent ZEV sales by 2025 and 100 percent sales by 2030;</li> <li>2. we need all electric transit buses for the MBTA by 2030 and for the RTAs and rail by 2035.</li> </ol>	<p>Legislation is not required, though CLF support several pending bills:</p> <ol style="list-style-type: none"> <li>1. Electric vehicle fleets by 2035, <a href="#">HD1305</a>, <a href="#">SD.2322</a>.</li> <li>2. Public transportation electrification targets: establishes requirements for electric MBTA buses by 2030 and regional transit authority buses and commuter rail by 2035, <a href="#">HD2144</a>, <a href="#">SD1320</a>.</li> <li>3. Banning internal combustion engine vehicle registration by 2035, <a href="#">HD1157</a>.</li> </ol> <p>Most of the above can occur through regulatory action.</p>
<p><b>Section 2.2 Strategy T3:</b> <i>Reduce Upfront ZEV Purchase cost Burden</i></p>	<p>Mandate, not simply consider, a low-to-moderate income incentive program available at point of sale.</p>	<p>No legislative or regulatory amendments are required. Nevertheless, legislation could establish the mandate and regulatory amendments would provide the details necessary.</p>
	<p>Provide incentives for school buses, medium- and heavy-duty vehicles.</p>	<p>No legislative or regulatory amendments are required.</p>
	<p>Require group purchasing program for state and municipal fleets. Identify a sustainable funding source.</p>	<p>No legislative or regulatory amendments are required.</p>
<p><b>Section 2.2 Strategy T4:</b> <i>Deploy Electric Vehicle Supply</i></p>	<p>Mandate that DPU establish new rate structures and establish rule that low- and moderate-income customers do not bear an inequitable share of costs for</p>	<p>No legislative or regulatory amendments are required. Notwithstanding, legislation (see <a href="#">HD1159</a> and <a href="#">SD.1066</a>) could</p>

<b>GHG Reduction Strategy Proposed by EEA</b>	<b>CLF Recommendation</b>	<b>Need for Legislation / Regulation</b>
<i>Equipment &amp; Enable Smart Charging</i>	time-of-use rates and ensure that they have access to and benefit from such rates.	establish the mandate and regulatory amendments would provide the details necessary, such as the minimum percent of buildings that are EV ready.
	Develop vehicle-to-grid programs.	No legislative or regulatory action required.
	Establish requirements to install a minimum number of EV charging stations for multifamily buildings.	Regulatory amendments are required.
	Direct DOER to work with municipalities to establish bus lanes and transit signal priority in congested locations.	Legislation is not required. A regulatory amendment is needed, absent legislation.
<b>Section 2.2 Strategy T5:</b> <i>Engage Consumers &amp; Facilitate Markets</i>	Fully fund MassCEC to allow it to keep doing what it is doing.	Legislation is required to establish a higher amount of funds for MassCEC.
	Create EV access to HOV lanes as part of congestion relief strategy.	Regulatory amendments are required.
	Require consideration of bus lanes and bicycle access when transportation projects go through MEPA review.	Regulatory amendments are required.
<b>Section 2.2 Strategy T6:</b> <i>Stabilize Light-Duty VMT &amp; Promote Alt Transportation Modes</i>	Rather than just stabilize, reduce vehicle miles traveled and include Department of Housing and Community Development in addition to EEA, MassDEP, and MassDOT in the coordinated approach to reducing VMT. The development of housing in the right locations at affordable cost levels is a critical component of a state-wide approach to reducing VMT.	No legislative or regulatory action required.
	Improve employer transit benefits and strengthen employer ride-sharing programs (lower threshold for number of employees to participate in programs).	No legislative or regulatory action required.



## CLF Recommendations to Strengthen Transportation Sector Strategies Overall

### ➤ **Add a Public Transit Strategy That Requires Preserving and Enhancing Transit Service and Electrifying Our Transit Fleets.**

The CECP has six strategies to reduce transportation sector emissions, yet none of them is focused on investments in public transportation. Pursuant to Executive Orders 579 and 580, the Commission on the Future of Transportation issued its report identifying transportation initiatives to achieve by 2040 that will both reduce GHG emissions and expand access to transportation options. The first recommended strategy in that report concludes that “investing in and expanding public transit service is critical.”<sup>3</sup> The report goes on to add that “by 2030, all . . . buses . . . purchased with state resources will be ZEVs.”<sup>4</sup> It would be absurd for the CECP to have an entire section devoted to the transportation sector that omits strategies to: (1) maintain and expand transit; and (2) electrify our buses and trains. We urge EEA to include a seventh transportation strategy that calls attention to investments in our public transit systems so that various reports and decisions from the Baker Administration are in lockstep with one another. Investing in public transportation has many co-benefits for public health beyond reducing congestion and reducing single occupancy vehicle trips.

We further recommend adding a climate justice component to the public transit strategy. To promote more equity in the transit systems and increase access to public transit for EJ populations, the MBTA and RTAs should adopt low-income fares. Access to transit is a lifeline to many who have no other means of transportation to safely and reliably reach destinations such as jobs, schools, grocery stores, and healthcare facilities.

## CLF Recommendations to Strengthen Strategy T1 (Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions)

- **Increase Percent of Transportation and Climate Initiative Investments in Underserved and Overburdened Communities;**
- **Add Action to Expand Air Monitoring and Reduce Pollution in Hotspots; and**
- **Plan to Reduce Disparate Impacts of Biofuels on EJ Populations.**

1. *Add Requirement That the Administration Will Commit Much Higher Investments in Overburdened and Underserved Communities.*

Strategy T1 is focused on the Transportation and Climate Initiative Program (“TCI-P”). CECP at 20. TCI-P needs to redress longstanding impacts of the transportation sector on EJ populations, which have been disproportionately impacted by GHG emissions from transportation. Specifically, the CECP should include the commitment for the Administration to

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<sup>3</sup> Commission on the Future of Transportation, Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume 1, at 35 (December 2018). <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.

<sup>4</sup> *Id.* at 54.

develop a detailed public plan for a public engagement/decision-making process to determine how to spend TCI-P revenue, including specifying investment targets in walking, transit, and biking infrastructure. In addition, the CECP should note plans to increase the investments of TCI-P revenue in EJ populations from 35 percent to at least 70 percent and commit to appointing the equity advisory board by summer 2021.<sup>5</sup>

We further recommend adding a climate justice component to strategy T1. The CECP should commit to launching air quality monitoring programs for EJ populations that are the most overburdened by air pollution from the transportation sector in the Commonwealth by 2022. To fully account for the health impacts and co-benefits of proposed policies, the Commonwealth needs to expand the air monitoring network, actively analyze air monitoring data, and consistently review environmental and energy policies to assess what is working and what needs to be revised to achieve air quality improvement. This will require monitoring for black carbon, ultrafine particulate matter, and nitrogen oxides (“NOx”), since these pollutants are commonly associated with transportation fuels. Strategy T1 should also include a commitment for the Baker Administration to incorporate the needs and experiences of overburdened and underserved communities into the TCI-P policy-making process.

2. *Add Requirement for the Commonwealth to Reduce Air Pollution in Hotspots.*

Air pollution comes from various sources, with traffic being a dominant contributor to higher concentrations of air pollutants near busy roadways. NOx are emitted in vehicle exhaust and are a good indicator of traffic pollution.<sup>6</sup> The majority of air pollutants in urban neighborhoods, including NOx, ultrafine particles, and black carbon, result from local traffic.<sup>7</sup> Exposure to ultrafine particulate matter is associated with a complex set of public health impacts.<sup>8</sup> Most existing air monitors in the region that monitor particulate matter (“PM”) only capture PM above 2.5 microns in diameter and not the ultrafine particles associated with health impacts from localized pollution hotspots. The existing array of monitors must be supplemented with new equipment and expanded to additional locations (including locations near EJ populations as discussed above) to capture traffic-related ultrafine particles, black carbon, and NOx.

A Harvard study found that an increase in long-term air pollution exposure (1 µg/m<sup>3</sup>) leads to a COVID-19 death rate that is eight percent above the risk borne by residents of communities without such exposure.<sup>9</sup> The Commonwealth lacks sufficient baseline data to

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<sup>5</sup> Two bills filed in the 192<sup>nd</sup> legislative session incorporate a requirement to direct funds to underserved and overburdened communities at a minimum of 70 percent. See [HD3905](#), [SD2317](#).

<sup>6</sup> University of Toronto Faculty of Applied Science and Engineering, Southern Ontario Centre for Atmospheric Aerosol Research, *Near-Road Air Pollution Pilot Study: Summary Report*, at 6 (2019). <https://www.socaar.utoronto.ca/wp-content/uploads/2019/10/SOCAAR-Near-Road-Air-Pollution-Pilot-Study-Summary-Report-Fall-2019-web-Final.pdf>.

<sup>7</sup> *Id.* at 7.

<sup>8</sup> Walker, D.I., Lane, K.J., Liu, K. *et al.*, Metabolomic assessment of exposure to near-highway ultrafine particles. *J Expo Sci Environ Epidemiol* 29, 469–483 (2019). <https://doi.org/10.1038/s41370-018-0102-5>.

<sup>9</sup> Wu, X., Nethery, R. C., Sabath, M. B., Braun, D. and Dominici, F., 2020. Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. *Science advances*, 6, p.eabd4049, <https://projects.iq.harvard.edu/covid-pm>.

begin to address this inequity and prevent further harm. Expanded air monitoring for black carbon, NOx, and ultrafine particulate matter will be necessary for the Commonwealth to determine baseline conditions and track improved air quality trends.

We recommend that the CECP require the Massachusetts Department of Environmental Protection (“MassDEP”) to engage a broad stakeholder group that includes representatives of EJ organizations, academic institutions, and labor to identify air pollution hotspots throughout the Commonwealth. Once those hotspots are determined, the Commonwealth should update its Air Quality Monitoring Network and Annual Plan to expand its monitoring network. To do so, MassDEP should establish baseline air quality conditions in 2021 and set annual targets to reduce the average air pollution for ultrafine particulates, black carbon, and NOx in those locations. Data from the air monitors should be publicly accessible and provide near-time information. By 2022, the Commonwealth should set enforceable annual air pollution improvement targets to ensure that air pollution hotspots achieve significantly improved air quality by 2032. We support using funding allocated for clean transportation to help cover the costs associated with improving air quality in pollution hotspots. For example, funds from the Regional Greenhouse Gas Initiative, already allocated for clean transportation purposes through the MOR-EV program, could be used to expand the Commonwealth’s air quality monitoring network along with other funding sources, such as TCI.

*3. Plan to Reduce Disparate Impacts of Biofuels on EJ Populations.*

While we support a Low Carbon Fuel Standard (“LCFS”) for transportation fuels, the CECP should specify which fuels qualify. For example, will biofuels meet the LCFS? If biofuels will be incorporated into the LCFS, then the CECP must acknowledge the need to ensure the safety of the transportation of those fuels. Transportation of biofuels by truck or rail would result in increased GHG emissions in communities along truck routes and near fuel blending facilities. At present, those facilities are disproportionately located in EJ populations. Moreover, biofuels, such as ethanol, are highly flammable, especially when transported in large quantities. The CECP needs to outline a plan that avoids negative impacts associated with the transportation of biofuels and eliminate potential burdens on EJ populations.

## **CLF Recommendation to Strengthen Strategy T2 (Implement Coordinated Advanced Clean Vehicle Emissions and Sales Standards)**

➤ **Require Fleet Electrification Targets for Medium- and Heavy-Duty Vehicles.**

Electrifying our public transit systems and school buses will result in improved air quality and will reduce the burdens associated with air pollution hotspots. We recommend that the CECP include:

- Implementing the MBTA Bus Transformation Office approved by the Fiscal and Management Control Board recommendations from November 2019 by prioritizing new electric bus procurements on routes serving EJ populations. The MBTA must begin immediate planning and design work for 100 percent electric bus facilities to meet the goal of having a 100 percent electric bus fleet by 2030.

- Implementing the MBTA Rail Vision approved by the Fiscal and Management Control Board in November 2019 with priority electrification for the Fairmount Line, Newburyport/Rockport Line through Lynn, and Providence/Stoughton Line by 2024, and planning to electrify the remainder of the commuter rail system by 2035. All state vehicle purchases must be zero-emission vehicles (“ZEV”) starting January 1, 2026, excluding municipalities, regional school districts, MBTA, and RTAs. The CECP must set targets to electrify state and municipal fleets by 2030: fleets owned, leased, or operated by the Commonwealth or municipalities should transition to ZEVs with priority in locations that are air pollution hotspots in EJ populations. In addition, Transportation Network Company fleets should be ZEV by 2025.
- The CECP should set targets to ensure that no internal combustion engine vehicles are sold to any purchaser, public or private, or newly registered, after 2034.

### CLF Recommendation to Strengthen Strategy T3 (Reduce Upfront ZEV Purchase Cost Burden)

#### ➤ **Require Incentive To Be Paid at the Point of Sale.**

The CECP notes that the Department of Energy Resources (“DOER”) “will explore providing MOR-EV rebates at point of sale in 2021” and “investigate the development of a low and moderate income (“LMI”) consumer program for ZEVs”. CECP at 22. We recommend that the language be revised to commit to these actions so that it reads: “the Department of Energy Resources will provide MOR-EV rebates at point of sale in 2021” and will “develop an LMI consumer program for ZEVs by 2022.” To incentivize electric vehicle (“EV”) adoption for larger fleets, including municipalities and the Commonwealth, Massachusetts should establish a group purchasing program to lower costs for state/municipal ZEV procurements by the end of 2021.

### CLF Recommendation to Strengthen Strategy T4 (Deploy Electric Vehicle Supply Equipment & Enable Smart Charging)

#### ➤ **Set a Numerical Target for Charging Stations and Require Utilities to Implement Rate Structures to Promote Low-Cost Electric Vehicle Charging.**

To achieve widespread adoption of EVs for both individual and commercial vehicles, the Commonwealth must increase EV charging infrastructure and set goals for the number of charging stations for both commercial and residential properties. To achieve success, the Commonwealth should:

- Set a numeric target for the number of charging stations that need to be built in the next decade to meet ZEV goals. The [EV- Pro Lite tool](https://afdc.energy.gov/evi-pro-lite) can be used to estimate the charging needs and impacts on load profile.<sup>10</sup>
- Launch curbside/utility pole charging programs in collaboration with municipalities and establish incentives for other challenging sectors.

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<sup>10</sup> EV-Pro Lite Tool, <https://afdc.energy.gov/evi-pro-lite>.

- Require utilities to propose alternative rate structures and consumer incentive programs to encourage charging overnight or at other beneficial times.
- Require utilities to install a public charging station upon a municipality’s request and include the costs in the rate base.
- EV charging should be designed to accommodate EVs, e-bikes, and e-scooters, and other forms of micro-mobility.
- Provide incentives for purchase of residential charging stations to promote EV adoption.
- Require that all owners of existing multi-unit commercial and residential buildings who maintain more than five parking spaces for building occupant use install EV charging stations according to the following metrics: ten percent of parking spaces shall have an EV charging station or at least one EV charging station by 2022; 25 percent of parking spaces shall have an EV charging station or at least three EV charging stations by 2025; and 50 percent of parking spaces shall have EV charging stations or at least 5 EV charging stations by 2030.<sup>11</sup>

### CLF Recommendation to Strengthen Strategy T5 (Engage Consumers & Facilitate Markets)

#### ➤ **Commit to Consumer Education, With a Focus on EJ Populations.**

Raising awareness of EV programs like MasseVolve, MOR-EV-Trucks, and Drive Green programs is crucial to further adoption of EVs statewide. To gauge the success of these initiatives, EOEEA should provide an annual report on the strategy actions in the CECP including the ACTNow and the Massachusetts Clean Energy Center (“MassCEC”) pilot programs on medium- and heavy-duty ZEVs, urban delivery & fleet electrification, and EV charging infrastructure discussed in this section. In addition, DOER should consider folding incentives for EVs, including e-bikes, and residential charging stations into the Mass Save program brand to easily raise awareness for these initiatives.

### CLF Recommendation to Strengthen Strategy T6 (Stabilize Light-Duty VMT & Promote Alternative Transportation Modes)

#### ➤ **Stabilize Vehicle Miles Traveled and Promote Mode Shift.**

While rapid electrification of the transportation sector is essential, this transportation decarbonization strategy is incomplete without long-term investments in a robust and reliable public transit system and changes in our land use policy to support more dense, affordable, mixed-use development near transit. By depending almost exclusively on electrification and

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<sup>11</sup> These metrics are aimed at ensuring available charging infrastructure to accommodate future demand of our electrified transportation systems. See Marie Rajon Bernard and Dale Hall, “Efficient planning and implementation of public chargers: Lessons learned from European cities,” *International Council on Clean Transportation*, (Feb. 2021), Available at: <https://theicct.org/sites/default/files/publications/European-cities-charging-infra-feb2021.pdf>.

telecommuting, this approach runs the risk of perpetuating the inequities evident in our transportation system today. Telecommuting is not a policy solution. Promoting “telecommuting” would exacerbate inequities, resulting in higher-income office workers staying home during the workday, and lower-income service and retail workers needing to commute via car or on transit that would be even harder to fund due to reduced ridership.

As noted in the interim CECP, “the increase in VMT and vehicle size has largely offset the emissions benefit from more stringent federal fuel efficiency standards”. CECP at 17. To mitigate the increase in emissions associated with rising VMT, the interim CECP relies heavily on vehicle electrification. This misses an opportunity to address the problem at its source and to achieve the multitude of co-benefits associated with reducing VMT through enabling more compact growth near transit. These include:

- Alleviating traffic congestion and promoting job access: Massachusetts has been home to some of the nation’s worst traffic congestion. Furthermore, reducing VMT through investments in public transit will help improve access to jobs and services for residents without a personal vehicle.
- Improving public health outcomes: In addition to the economic benefits, there are several public health advantages to getting more people out of cars and onto public transit, walking, and biking. Auto travel causes 360 deaths annually in Massachusetts due to crashes.
- Reducing building energy demand: Multifamily housing has a more efficient building envelope and shared systems which enable more cost-effective implementation of high efficiency systems during construction.
- Ensuring more land is available for preservation and carbon sequestration and alleviating pressure on the grid to accommodate the influx of electric vehicles: Importantly, land use strategies are much more cost-effective than the proposed investment in EV subsidies. They can also be designed equitably so that low-income residents are benefitted and not harmed by changes in land use, pricing, and transit service.

These strategies fall into a “no-regrets” zone in which there are few reasons the Commonwealth would regret acting on them. They will only be an effective pathway forward, however, if we make long-term investments in a robust, reliable, and affordable public transportation system. The interim CECP greatly underestimates the important role public transit plays in advancing an equitable decarbonization strategy. We strongly urge the EEA to elevate the need to invest in a robust, reliable, and affordable public transportation system in the CECP. The primary way to achieve this is to move more trips from single-occupant vehicles to public transit.

The CECP can also promote alternative transportation modes by directing DOER to require all highway projects subject to an environmental impact report to consider the feasibility of adding a high-occupancy vehicle lane and/or bicycle lanes. Additionally, the CECP should direct DOER to work with municipalities to establish bus lanes and transit signal priority in congested locations.

## Chapter 3. Transforming our Buildings

The buildings sector closely follows the transportation sector in emissions reduction priority for the next nine years, given the slow rate of turnover for building heating and cooling equipment.

### Summary Table of CLF Buildings Sector Recommendations

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
N/A	Justify modeling assumptions utilized in Figure 7.	No legislation or regulations are required.
B1: <i>Avoid Lock-In of Building Systems That Are Not 2050 Compliant</i>	Allow all municipalities to opt-in to new net zero code by 2022, then phase in net zero code as base building code with benchmarks in 2025 and 2028.	No legislation or regulations are required.
	Develop action plan and contingency measures for decarbonizing Mass Save incentives.	No legislation or regulations are required.
B2: <i>Pivot the Market for Building Envelope Retrofits and Clean Heating Systems</i>	Direct state funds to ensure EJ populations are participating in the transition at rates comparable to other communities in the Commonwealth.	No legislation or regulations are required.
	Actively manage gas transition to ensure equity.	No legislation is required; regulations would be beneficial to set guidance about the transition away from gas.
	Require DOER to lead the Administration in reforming Green Communities Act.	Legislation is required.
	Direct DOER to provide incentives to transition low-income households to electrified heating sources and, if necessary, subsidize electricity rates temporarily.	No legislation or regulations are required.
	Allocate resources to training fossil fuel workers to prepare to work with decarbonization technologies and track diversity in workforce.	No legislation or regulations are required.
	Set benchmarks to assess whether electrification targets are being met and provide the necessary funding.	Regulatory amendments may be necessary.

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
	Target highest-emitting buildings and lower-income households for electrification and efficiency upgrades; ensure that programs are designed to assist lower-income households.	Regulatory amendments would establish criteria for priority upgrades.
	Require commercial buildings larger than 5,000 square feet to begin reporting their GHG emissions annually in 2021 and halve their 2021 emissions by 2030.	Legislation would be beneficial; regulatory amendments are required.
	Propose regulatory amendments requiring gas utilities to reduce gas consumption.	Legislation would be beneficial; regulatory amendment is required.
	Promulgate regulation requiring heating fuel providers to reduce fuel consumption.	Legislation is beneficial; regulatory action is required.
	Direct DOER to phase out incentives for fossil fuel heating systems for both new construction and existing buildings by 2022, not 2024, and direct those funds to electrification efforts.	No legislation or regulations are required; amended regulations would be helpful to ensure timeline.
	Direct Mass Save to (1) incentivize advanced controls for heat pumps that replace gas-powered equipment; (2) develop program to incentivize removal of fossil fuel equipment after installation of heat pump; (3) include heat pump target in next Three-Year Plan; (4) act as an intermediary between customers and the credit market in the event the CECP relies on an APS-like framework for increasing heat pump adoption.	No legislation or regulations are required. A DPU order is necessary.
	Direct Mass Save to provide 100 percent incentive for (1) weatherization upgrades for low- and moderate-income customers and buildings that commit to electrification, and (2) mitigating barriers for low- and moderate-income customers and customers in EJ populations.	No legislation or regulations are required. A DPU order is necessary.



GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
	Provide specific direction and resources to MassCEC.	No legislation or regulations are required.
	Provide specific guidance to municipal utilities, nonprofits, and municipalities to pursue decarbonization.	No legislation or regulations are required.
	Require state agencies to ensure appropriate heating equipment is installed and that heat pumps are the least-cost option.	No legislation or regulations are required; amendments to the energy efficiency guidelines and DPU order about cost-benefit test would be beneficial.
	Use direct mandates to phase the supply chain off of fossil equipment.	Legislation would be beneficial; regulatory amendment is required.
<i>B3: Convene the Commission and Task Force on Clean Heat &amp; Cap Heating Fuel Emissions</i>	Consider imposing the emissions cap on the purchase of space and water heating systems and based on their lifetime emissions. Alternatively, impose surcharge on heating fuels and prohibit new thermal diesel installations. Direct revenue to assist low- and moderate-income people and EJ populations to transition away from fossil fuel heating systems.	Amended regulations are required.
	Require consideration of alternative utility business models as part of the development of an emissions cap, such as regulatory amendments that would allow gas utilities to participate in electrification of the energy market.	Amended regulations are required.
	Direct DOER to propose regulations relating to consumer education, installation of appropriate equipment, and development of programs to provide upfront capital to consumers to purchase electrification equipment.	Amended regulations are required.

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
	Direct DPU to require electric distribution companies to (1) fully fund energy efficiency and decarbonization services to any residential owner earning up to 80 percent of the statewide median income and (2) fund such services on a sliding scale for residential owners earning 81-120 percent of the statewide median income and all renters located in an EJ population.	No legislation or regulations are required. A DPU order is necessary.
	Use a fuel-based emissions cap only as a supplement to policies that directly drive electrification.	No legislation is required; amended regulations are necessary.
	Remove fuel and gas blending as a Strategy Action.	No legislation or regulatory amendments are required; amended regulations would be appropriate to give the directive.
	Ensure Commission and Task Force mandate is limited to an electrification pathway.	No legislation or regulations are required.
	Revise Commission and Task Force mandate to require consideration of “Zero up-front capital solutions for moderate income residents on a sliding scale up to 120 percent of area median income or state median income.”	No legislation or regulations are required.
	Provide short-term, specific policies to guide building sector in aggressive transition.	No legislation or regulations are required.
	Incorporate recommendations from IAC and CJWG reports.	No legislation or regulations are required.

## CLF Recommendations to Strengthen Buildings Sector Strategies Overall

### ➤ **Justify modeling assumptions used in Figure 7.**

The CECP provides that emissions in the building sector must decrease by roughly 9.4 MMTCO<sub>2</sub>e over the next 10 years to put the Commonwealth on a path to Net Zero in 2050. CECP at 28. The CECP also models the buildings sector's emissions reductions as split proportionally between residential and commercial properties. CECP at 27. The CECP should provide more support for its modeling assumptions and data on the overall strategy for this goal, as illustrated in Figure 7, and the relative roles assigned to residential and commercial properties in meeting that goal.

## CLF Recommendations to Strengthen Strategy B1 (Avoid Lock-In of Building Systems That Are Not 2050 Compliant)

- **Allow all municipalities to opt-in to new net zero code by 2022, then phase in net zero code as base building code with benchmarks in 2025 and 2028; and**
- **Develop action plan and contingency measures for decarbonizing Mass Save incentives.**

Strategy B1 provides that DOER will present a high-performance stretch energy code to the Board of Building Regulation and Standards in 2021. CECP at 30. It will allow Green Communities to opt in beginning in 2022 and it will become mandatory and effective statewide by January 1, 2028. CECP at 30. This recommendation could be improved by allowing all municipalities to opt-in to a new net zero code by 2022. Expanding adoption among municipalities would presumably ease the transition to statewide effectiveness. Indeed, if the Commonwealth adopted a net zero on-site new construction code by 2023, emissions from new buildings would be reduced by 87 percent in 2050, as compared to the standard building code. Roadmap at 54. If the code becomes mandatory in 2030, emissions are only reduced 54 percent. *Id.* In addition, by 2025, the CECP should replace the high-performance code with a net zero stretch code that combines the existing stretch code and the net zero opt-in code. Finally, by 2028, a version of this net zero code should transition to become the base building code.

Strategy B1 further provides that DOER will work to eliminate Mass Save incentives for fossil fuel equipment in new construction in 2022 and instead align incentives with a high-performance building code. CECP at 30. Given that this is not something DOER can achieve unilaterally under the current statutes, EEA and DOER staff should work with the Office of the Attorney General and Department of Public Utilities (“DPU”) to ensure that this essential step is achieved.

## CLF Recommendations to Strengthen Strategy B2 (Pivot the Market for Building Envelope Retrofits and Clean Heating Systems)

1. *Center equity and climate justice in the transition to clean heating.*
  - **Direct state funds to ensure EJ populations are participating in the transition at rate comparable to other communities in the Commonwealth. Set annual targets for enrolling low- and moderate-income ratepayers and EJ populations in energy efficiency programs;**
  - **Actively manage gas transition to ensure equity, including reforms of the Green Communities Act;**
  - **Direct DOER to provide education and incentives to transition low-income households to electrified heating sources and, if necessary, subsidize electricity rates temporarily; and**
  - **Allocate resources to training fossil fuel workers to prepare to work with the decarbonization technologies and track diversity in workforce.**

The CECP's focus in Strategy B2 on reducing emissions in the building sector by transitioning off of fossil fuel-driven heating systems is essential. CECP at 31. The Commonwealth must play an active role in ensuring this transition is equitable. First, the CECP should direct state funds to ensure EJ populations are participating in the transition at rates comparable to other communities in the Commonwealth. Otherwise, EJ populations will face rising heating fuel prices as consumers transition to electrification in large numbers. It may accomplish this by setting mandatory annual targets for enrolling low- and moderate-income ratepayers and congregate settings serving EJ populations in heating transition energy efficiency programs.

Second, the CECP must aggressively pursue a managed transition away from the gas system to ensure that moderate-income households and renters are not ultimately left to pay high heating fuel prices and without assistance to transition to a clean heating fuel source. Accordingly, DOER must lead the charge in docket D.P.U. 20-80 for emissions reductions and equity to avoid a pipeline gas-heavy result in the docket. Additionally, given barriers to electrification in pending Energy Efficiency Guideline revisions (DPU 20-150), DOER must also lead the administration in drafting and securing passage of a major reform to the Green Communities Act. Such a reform must ensure that state agencies are no longer able to favor gas system expansion over large scale electrification incentives on the basis of "cost efficiency."

Third, as discussed in the February 25, 2021 memorandum regarding "Design of the CECP Policy Approach for Buildings," prepared by Synapse Energy Economics, Inc. and provided here in Appendix A ("Appendix A"), the CECP should direct DOER to provide education and incentives to electrify these low-income customers' homes and, if necessary, subsidize electricity rates to offset near-term electricity cost increases. Appendix A at 11. Strategy B2 notes that DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in EJ populations. CECP at 31. EEA must ensure that access to clean heating for these groups is achieved through electrification, rather than biofuels

or renewable natural gas (“RNG”),<sup>12</sup> which would cause low-income households to bear the rising costs associated with fossil fuels or the high costs of early replacement of fossil fuel equipment. Appendix A at 11.

Finally, the rapid and widespread adoption of electrification technologies also presents challenges and opportunities for training laborers. The CECP should allocate resources to training fossil fuel workers to prepare to work with decarbonization technologies, such as HVAC, onsite solar, and air- and ground-source heat pumps. The Commonwealth should also seize the opportunity to track diversity among this expanded workforce.

2. *Plan and sequence action for a successful transition.*

- **Set benchmarks to assess whether electrification targets are being met, and provide the necessary funding;**
- **Target highest-emitting buildings and low- and moderate-income households for electrification and efficiency upgrades;**
- **Require commercial buildings larger than 5,000 square feet to begin reporting their GHG emissions annually in 2021 and halve their 2021 emissions by 2030; and**
- **Promulgate regulatory amendments requiring gas utilities to reduce gas consumption and new regulations requiring other heating fuel providers to reduce fuel consumption.**

The CECP correctly emphasizes the need to scale up electrification efforts as quickly as possible to capture the maximum number of heating stock turnover points. CECP at 28. Given the significant number of heat pumps that must be installed and the uncertainty about whether the CECP’s policies will achieve these goals, the CECP should set benchmarks to assess whether electrification targets are being met, and it should provide the necessary funding.

Beyond scaling up heat pump installations for all buildings, targeted efforts can lead to a greater reduction in emissions than the CECP currently contemplates. As described further in Appendix A, the CECP should target electrification and efficiency initiatives toward the highest-emitting buildings, which could reduce emissions by up to 13 MMTCO<sub>2</sub>E by 2030, exceeding the necessary reductions for the building sector. Appendix A at 2. Appendix A notes that “just 22 percent of homes (about 650,000 units) emit half of the residential fuel-combustion emissions, and the million highest-emitting homes (just over one third of the total) are responsible for 68 percent of emissions. In the commercial sector...one quarter of the floor space is responsible for between two thirds and three quarters of emissions”. Appendix A at 3-4. The CECP can shore up these targeted efforts by also requiring commercial buildings larger than 5,000 square

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<sup>12</sup> Specifically, RNG is expected to have a greater GHG abatement cost than the abatement cost derived from the electric sector. See Synapse Energy Economics, et al., “Avoided Energy Supply Components in New England: 2021 Report,” pp. 181-184 (March 2020), <https://www.synapse-energy.com/sites/default/files/AESC%202021.pdf>. See also ICF Resources Inc., “Study on the Use of Biofuels (Renewable Natural Gas) in the Greater Washington, D.C. Metropolitan Area,” (March 2020), <https://edocket.dcpsec.org/apis/api/filing/download?attachId=101994&guidFileName=e69b6cb2-963c-4122-aca3-3b45e838b2b7.pdf>; Sutherland, B. G. Pricing CO<sub>2</sub> Direct Air Capture. *Joule*, Cell Press. Volume 3, Issue 7, 17 July 2019, pp. 1571-1573 (2019), <https://doi.org/10.1016/j.joule.2019.06.025>.

feet begin reporting their GHG emissions annually in 2021 while mandating that they halve their 2021 emissions by 2030.

The CECP should also target low- and moderate-income households for electrification and efficiency upgrades. Appendix A at 4. Although the group of highest-emitting homes generally consists of higher-income occupants, inefficient and older buildings with low- and moderate-income occupants are also high-emitting and pose a significant financial burden to the occupants. Appendix A at 4. The CECP must ensure that throughout these electrification and efficiency efforts, programs are designed to achieve equitable outcomes by assisting lower-income households to transition from fossil fuels and access building shell upgrades. Appendix A at 4.

Targeted electrification and efficiency improvements would give rise to additional benefits, including optimizing the benefits of electrification, nearly eliminating the need for biofuel blending, and providing opportunities for district heating solutions in geographic clusters. Appendix A at 4, 5.

Strategy B2 is heavily focused on using incentives to encourage residents, companies, and renters to pivot the market toward heating electrification and building envelope retrofits. CECP at 31. These incentives and encouragement of actions by building owners and occupants are essential to achieve building sector emission reduction goals. The actions of local distribution companies (“LDCs”) and other heating fuel suppliers will also play a pivotal role in planning to meet net zero by 2050. The CECP should direct MassDEP to require LDCs and fuel oil and propane suppliers to submit a plan to MassDEP for review and approval demonstrating how they will reduce gas or fuel consumption by 20 percent by 2025 and by 50 percent by 2030. This would complement the efforts currently underway at the DPU to envision the future of the gas distribution industry in Massachusetts.

Such plans should exclude pathways that rely on distributed use of biogas or biofuel blending to reduce emissions. Instead, LDCs and fuel suppliers should include plans to expand heat pump rebate programs that prevent inequitable energy cost shifts to low-income ratepayers and renters, explore new business models, and propose modifications to cost recovery rules that will be submitted to the DPU for approval. Active participation by LDCs and fuel suppliers would create another source of pressure on the market to pivot towards electrification. Additionally, LDCs should repair gas leaks to achieve zero-emissions related to lost and unaccounted-for gas. LDCs should also be required to determine whether a leak should be repaired or retired and replaced with electrification based on an economic analysis. Leaks that occur on lines serving a relatively small customer base should be retired and the end use appliances electrified.

3. *Align Mass Save with the net zero by 2050 goal.*

- **Direct DOER to phase out incentives for fossil fuel heating systems for both new construction and existing buildings by 2022 and direct those funds to electrification efforts;**
- **Direct Mass Save to (1) incentivize advanced controls for heat pumps that replace gas-powered equipment; (2) develop program to incentivize removal of fossil fuel equipment after installation of heat pump; (3) include heat pump target in next Three-Year Plan; (4) act as an intermediary between customers and the credit market in the event the CECP relies on an APS-like framework for increasing heat pump adoption; and**
- **Direct Mass Save to provide 100 percent incentive for (1) weatherization upgrades for low- and moderate-income customers and buildings that commit to electrification, and (2) mitigating barriers for low- and moderate-income customers and customers in EJ populations.**

As recommended by the CJWG, Mass Save must be aligned with the net zero by 2050 requirement in a manner that prioritizes GHG reductions and equity outcomes. Strategy B2 further provides that DOER will work to phase out incentives for fossil fuel heating systems as soon as possible, limiting fossil fuel heating system incentives in the 2022-2024 Three-Year Plan and ending all fossil fuel heating system incentives by the end of 2024. CECP at 31. In contrast, Strategy B1 notes that DOER will work to eliminate Mass Save incentives for fossil fuel equipment in *new* construction in 2022. CECP at 30. No reason is given for delaying the phase-out of incentives by two years for existing buildings. Moreover, removing the incentives, without more to encourage electrification, will not necessarily lead to support from program administrators for consumers to switch from gas to electric heat. Appendix A at 11. The CECP should direct DOER to phase out incentives for fossil fuel heating systems for both new construction and existing buildings by 2022 and direct those funds toward electrification measures. Appendix A at 11. Mass Save's targets should be amended to account for the removal of these incentives, if necessary. Appendix A at 11.

Several other concurrent programs can hasten the electrification of heating systems. Mass Save should continue to incentivize advanced controls for heat pumps that are installed to replace gas-powered equipment, similar to its current incentives for oil and propane replacement. Appendix A at 11. Additionally, Mass Save should develop a program to provide incentives and education to customers who have installed heat pumps to remove existing fossil fuel equipment. Appendix A at 11. In its next Three-Year Plan, Mass Save should include a heat pump target. This target should require program administrators to assess a building's pre-energy efficiency heating needs and install an appropriately sized heat pump, paired with advanced controls. Appendix A at 11. Finally, while the CECP does not contemplate the Alternative Energy Portfolio Standard ("APS") as a means for increasing heat pump adoption, it may consider assigning costs to energy suppliers through a market mechanism akin to the APS. Appendix A at 12. In the event it chooses this strategy, the Mass Save program should act as an intermediary between customers and the credit market to provide price stability. Appendix A at 12.

As noted above, it is essential that efficiency upgrades accompany heat pump installations. Mass Save can play a critical role by offering a 100 percent incentive for weatherization upgrades to low- and moderate-income customers and renters and to buildings whose owners commit to electrify their heating equipment. Additionally, with respect to low- and moderate-income customers and customers in EJ populations, Mass Save should offer 100 percent incentives to mitigate pre-weatherization and pre-electrification barriers.

4. *Provide sufficient direction and guidance to key actors.*

- **Provide specific direction and resources to MassCEC; and**
- **Provide specific guidance to municipal utilities, nonprofits, and municipalities to pursue decarbonization.**

Strategy B2 also places significant responsibility on MassCEC to facilitate the development and adoption of electrification technologies. CECP at 31-32. While MassCEC may technically be best equipped to carry out these measures, the CECP should ensure that MassCEC is given the direction and resources needed to effectively achieve its goals. The CECP should set specific, measurable goals and actions to track MassCEC's progress towards achieving its directives of workforce development, enhancing benefits to underrepresented communities, and facilitating the market and technology toward decarbonization, among many other initiatives. Similarly, given MassCEC's recent difficulties in obtaining adequate funding, the CECP must direct state funds to MassCEC sufficient for it to carry out the many actions with which it is tasked.

This Strategy also notes that municipal utilities, nonprofits, municipalities "can and must" focus on incentivizing heat pump adoption and building envelope improvements. CECP at 32. Engaging these additional actors would provide a useful opportunity for quickly scaling up heat pump adoption. The CECP fails, however, to elaborate on the types of actions that are needed, nor does it memorialize this recommendation in a strategy action. CECP at 31-32. The CECP should provide additional, specific guidance to municipal utilities, nonprofits, and municipalities to assist in these decarbonization goals.

5. *Supplement incentives with specific direction and mandates.*

- **Require state agencies to ensure appropriate heating equipment is installed and that heat pumps are the least-cost option; and**
- **Use direct mandates to phase the supply chain away from fossil equipment.**

EEA and its agencies must work with contractors, architects, and state building codes to ensure that appropriate equipment is installed at all times and that building owners understand the least cost option. These efforts should also ensure that heat pumps are the least cost option with incentives. Finally, as a complement to incentive strategies, the CECP should increase heat pump adoption through the use of direct mandates to phase the supply chain away from fossil equipment. For instance, effective immediately, no new oil furnaces should be installed and gas use must phase down.



## CLF Recommendations to Strengthen Strategy B3 (Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions)

1. *Carefully structure the Heating Fuel Emissions Cap to drive sector-wide investments for the long term, not just 2030.*
  - **Consider imposing the emissions cap on the purchase of space and water heating systems and based on their lifetime emissions, with revenue used to assist low- and moderate-income people and EJ populations off of fossil fuel heating systems;**
  - **Alternatively, impose a surcharge on heating fuels and prohibit new thermal diesel installations, with revenue used to assist low- and moderate-income people and EJ populations to transition away from fossil fuel heating systems;**
  - **Require consideration of utility business models as part of development of emissions cap, such as regulatory amendments that would allow gas utilities to participate in electrification of the energy market;**
  - **Direct DOER to propose regulations relating to consumer education, installation of appropriate equipment, and development of programs to provide upfront capital to consumers to purchase electrification equipment;**
  - **Direct DPU to require electric distribution companies to (1) fully fund energy efficiency and decarbonization services to any residential owner earning up to 80 percent of the statewide median income and (2) fund such services on a sliding scale for residential owners earning 81-120 percent of the statewide median income and all renters located in an EJ population; and**
  - **Use fuel-based emissions cap only as a supplement to policies that directly drive electrification.**

Both the CECP and Roadmap acknowledge that widespread electrification of the building sector is the most cost-efficient method of transition for many households and is an essential driver of emissions reductions. CECP at 28; Roadmap at 45. Given the stated need to rapidly scale-up the electrification of heating systems, the CECP must encourage electrification rather than additional fossil fuel usage. In contrast to these goals, the CECP proposes a long-term, declining emissions cap on heating fuels that may incentivize biofuel blending over electrification. CECP at 32. The CECP and Roadmap appear to assume that the emissions cap will encourage electrification for buildings for which electrification is feasible. For instance, the Roadmap asserts that the transition to electrification or decarbonized gas/biogas blending will disrupt the current market such that gas prices will rise and encourage electrification. Roadmap at 53.

An emissions cap alone, however, will not sufficiently advance the CECP's electrification targets, nor will it encourage an equitable transition. Appendix A at 7. As discussed in detail in Appendix A, the cap will presumably be structured as an upstream cap that places the initial onus on fuel suppliers. Appendix A at 6. In contrast to the CECP's focus on electrification through equipment and infrastructure replacement, the cap's disconnect between supplier and equipment purchaser would only serve to incentivize fuel suppliers to rely on fuel blending,

RNG, and hydrogen. Appendix A at 6. As such, if possible, the emissions cap should be structured to influence consumers' purchase of space and water heating systems and be based on the systems' lifetime emissions. Appendix A at 7. The emissions cap should take effect in 2023, and revenue generated by the cap should be used to assist low- and moderate-income people and EJ populations in transitioning away from fossil fuel heating systems. Alternatively, the CECP should encourage electrification in the building sector by prohibiting the installation of new thermal diesel infrastructure and by imposing a surcharge on heating fuels.

Additional policies that focus directly on electrification and altering utilities' business models must be the primary strategy actions driving this transition and be designed to ensure equitable outcomes. Appendix A at 6. For instance, consideration of utilities' business models should be factored into the development of the cap structure. Appendix A at 6. Specifically, penalties or other costs associated with the cap that are imposed on a supplier should be borne by shareholders rather than ratepayers. The Commission and Task Force should consider amended regulations that would allow natural gas utilities to participate in electrifying the energy market, such as the authority to create a thermal district heating utility or to receive an incentive for fuel switching to electric heat pumps. Appendix A at 6-7.

Moreover, significant barriers such as lack of information, lack of upfront capital, and split incentives between landlords and tenants can prevent consumers from choosing electrification even if it is more cost effective to do so. Appendix A at 7. Other barriers that contribute to the slow rate of heat pump adoption include inaccurate operation and sizing of systems, lack of controls, and customer uncertainty around comfort and performance. Accordingly, a market mechanism alone will be insufficient to overcome these obstacles, and consumer education, incentives, and market transformation activities must accompany a heating emissions cap. The CECP should direct DOER to propose regulations relating to consumer education, installation of appropriate equipment, and the development of programs to provide upfront capital to consumers to purchase electrification equipment. Additionally, DPU should require electric distribution companies to (1) fully fund energy efficiency and decarbonization services to any residential owner earning up to 80 percent statewide median income and (2) fund such services on a sliding scale for residential owners earning 81-120 percent of the statewide median income and all renters located in an EJ population. An emissions cap should be used only as a backstop in the event these primary electrification strategies do not create the necessary level of electrification. Appendix A at 7.

*2. Right-size use of biofuel blending.*

➤ **Remove fuel and gas blending as a Strategy Action.**

While the intended goal of the emissions cap may be to encourage electrification over the long term, a technology-neutral design will allow existing buildings and new buildings to delay the transition to electric HVAC systems and may spur the continued growth of fossil fuel equipment and infrastructure for heating. As a metric within Strategy Action B3, the CECP strives for fuel oil to be blended with biodiesel to achieve a ~ 20 percent reduction in carbon intensity by 2030 and for pipeline natural gas to be reduced in carbon intensity by 5 percent. CECP at 29. The CECP should remove fuel and gas blending as a Strategy Action.

a. Biofuel transportation poses risks to EJ populations.

Beyond the heating system impacts of fuel blending discussed below, the transportation of biofuels poses environmental and health risks to EJ populations. Transportation of biofuels by truck or rail would result in increased GHG emissions in communities along truck routes and near fuel blending facilities. At present, those facilities are disproportionately located in EJ populations. Moreover, biofuels, such as ethanol, are highly flammable, especially when transported in large quantities. If the CECP retains the use of fuel blending as a strategy action, it must acknowledge the need to maximize safety associated with the transportation of biofuels and outline a plan that avoids negative impacts associated with the transportation of biofuels and eliminate potential burdens on EJ populations.

b. Reliance on biofuel blending delays necessary electrification.

Prolonging the Commonwealth's reliance on fossil fuels for heating in pursuit of the 2030 emissions reduction target will delay the investment in electrification needed to meet net zero by 2050, in addition to raising significant equity concerns for consumers. Appendix A at 8. As the CECP notes, it is imperative that buildings whose HVAC equipment expires in the next 10 years replace their fossil fuel systems with electrification. CECP at 28. If instead the price signals and incentives that should drive consumers to electrification are hidden by the use of biofuel at the supplier level, key electrification opportunities will be missed and legacy and new fossil fuel systems will remain in operation well past 2030. Appendix A at 8. This would add to our stock of fossil fuel systems that will need to be replaced before the end of their useful lives, posing unnecessary costs to consumers, where the Commonwealth would have to electrify more rapidly to meet its 2040 and 2050 targets because it did not sufficiently electrify in 2021-2030. Appendix A at 8-9. Appendix A, Figure 3 illustrates the slowed pace of market transformation in a low-electrification scenario. Appendix A at 9. Finally, fuel blending will also promote continued investment in new gas infrastructure. Appendix A at 10. As gas use declines, customers with fossil fuel equipment will be forced to pay increasingly higher rates. Appendix A at 10.

c. Liquid biofuel blending for building heat does not provide enough benefit to be part of a net zero economy in 2050.

The CECP's reliance on biodiesel fuel blending to achieve emissions reductions overlooks significant uncertainties about the impacts of fuel blending. In December 2020, the Connecticut Department of Energy and Environmental Protection ("CT DEEP") published its "Draft Integrated Resources Plan: Pathways to achieve a 100 percent zero carbon electric sector by 2040" ("CT Draft IRP").<sup>13</sup> It considered, in part, the creation of a "portfolio standard for thermal energy" ("T-RPS") that included biodiesel blended into home heating oil. CT Draft IRP at 162. CT DEEP engaged in an intensive fact-finding process and ultimately recommended against creating a T-RPS that subsidized biodiesel-blended heating fuels, instead recommending a separate study of alternative mechanisms and technology to support building decarbonization.

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<sup>13</sup> Connecticut Department of Environmental Protection, "Integrated Resource Plan: Pathways to achieve a 100% zero carbon electric sector by 2040" (December 2020), <https://portal.ct.gov/-/media/DEEP/energy/IRP/2020-IRP/2020-CT-DEEP-Draft-Integrated-Resources-Plan-in-Accordance-with-CGS-16a-3a.pdf>.

CT Draft IRP at 165. CT DEEP concluded that the subsidization of biodiesel-blended fuel oil would be premature based on the many uncertainties and outstanding questions surrounding its deployment and environmental and health impacts. CT Draft IRP at 169, 171. The data and open questions militating against promotion of biodiesel blending include its impact on NOx concentrations in urban areas, standards and protocols needed to support high-biodiesel blends (such as 75 percent biodiesel and higher), and ability to restrict eligible feedstocks to waste food oils and greases. CT Draft IRP at 171-72.

Studies examining biodiesel's impact on NOx levels have produced inconsistent results, and it has been shown to increase formaldehyde levels. For instance, biodiesel fuel blends higher than B10 have been found to emit less pollutant CO, SO<sub>2</sub> and CO<sub>2</sub> than petroleum diesel, while B10 emitted higher SO<sub>2</sub> than traditional fuels.<sup>14</sup> Another study showed a reduction in CO and particulate matter ("PM") when burning biodiesel rather than heating oil, but formaldehyde levels were double in the biodiesel mix.<sup>15</sup> Biodiesel burning may also increase NOx levels, though research has been inconclusive.<sup>16</sup>

The strength of the biodiesel blend and the type of biodiesel used also play a role in determining emissions. Increasing the factor of biodiesel in fuel from B20 to B40 may reduce CO emissions even further, but the magnitude of this reduction may vary based on the type of feedstock used.<sup>17</sup> Similarly, an Environmental Protection Agency ("EPA") report that reviewed the impacts of two biodiesel fuels (soy- and animal-based) found that, while combustion-based CO<sub>2</sub> emissions were lower among the biofuels as compared to distillate petroleum fuel oil, there was an increase in NOx emissions when soy oil was used.<sup>18</sup>

Feedstock source is also relevant to evaluating biodiesel's GHG impact because the lifecycle emissions of the feedstock must be taken into account. The EPA report notes that GHG emissions that occur during a biofuel's "production and use cycle" must be understood to assess a biofuel's environmental impacts.<sup>19</sup> This includes analysis of the "production of the feedstock, the transport of the feedstock to the biodiesel production facility, the conversion of the feedstock to biodiesel, the transport of the biodiesel to the end user, and the combustion

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<sup>14</sup> Ghorbani, A., et al., A Comparative Study of Combustion Performance and Emission of Biodiesel Blends and Diesel in an Experimental Boiler, *Appl. Energy*, 88 (2011), 12, pp. 4725-4732.  
<https://www.sciencedirect.com/science/article/abs/pii/S0306261911004016>.

<sup>15</sup> A. Macor and P. Pavanello, "Performance and emissions of biodiesel in a boiler for residential heating," *Energy*, vol. 34, pp. 2025-2032 (2009). <https://www.sciencedirect.com/science/article/abs/pii/S0360544208002016>.

<sup>16</sup> Makaïre et al., "The use of liquid biofuels in heating systems: a review," 33rd Task Leaders Meeting of the International Energy Agency Implementing Agreement on Energy Conservation and Emissions Reduction in Combustion, 07-11 August 2011, Lund, Sweden.  
[https://orbi.uliege.be/bitstream/2268/95986/1/TLM\\_2011\\_Lund\\_110711\\_2.pdf](https://orbi.uliege.be/bitstream/2268/95986/1/TLM_2011_Lund_110711_2.pdf).

<sup>17</sup> Heravi, H. M., et al., The Effect of Various Vegetable Oils on Pollutant Emissions of Biodiesel Blends with Gasoil in a Furnace, *THERMAL SCIENCE: Year 2015, Vol. 19, No. 6*, pp. 1977-1984.  
<http://www.doiserbia.nb.rs/img/doi/0354-9836/2015/0354-98361500022H.pdf>.

<sup>18</sup> Miller, C. A., *Characterizing Emissions from the Combustion of Biofuels*. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/069, 2008.  
[https://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?Lab=NRMRL&dirEntryId=191572](https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=191572).

<sup>19</sup> Miller, C. A., *Characterizing Emissions from the Combustion of Biofuels*. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/069, 2008.  
[https://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?Lab=NRMRL&dirEntryId=191572](https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=191572).

of the biodiesel.”<sup>20</sup> For this reason, the Connecticut IRP notes that waste feedstocks have a lesser GHG impact than original-use or virgin feedstocks. CT Draft IRP at 167. Similarly, in California, the standard emissions factor for harvesting virgin soy oil is over 3 times as high as rendering used cooking oil.<sup>21</sup> The GHG factor for rendering canola oil is 1.3 times as high.<sup>22</sup> Massachusetts currently limits eligible liquid biofuel feedstocks to liquids derived from organic waste feedstocks, excluding petroleum-based waste and hazardous waste.<sup>23</sup>

d. Modeling assumptions do not support biofuel blending as 2030 strategy that maximizes our ability to reach net zero by 2050.

It does not appear that either the Roadmap or the accompany technical report “Energy Pathways to Deep Decarbonization” (“Energy Pathways Report”) engaged in a meaningful analysis to determine the potential impacts of biofuel use on GHG or NOx emissions, nor did they limit it to certain eligible feedstocks or limit the amount of biofuel that may be blended. For instance, the Roadmap assumes that net-zero-carbon fuels have a GHG emissions factor of zero. Roadmap at 91. It does not, however, limit the feedstocks that may be used, suggesting instead that biofuels will “likely” be derived from agricultural and forestry byproducts. Roadmap at 91. The Energy Pathways Report specifies that in its modeling, woody biomass, rather than wastes, was overwhelmingly used as feedstock for biofuels. Energy Pathways Report at 66-67. The Roadmap also suggests that zero-carbon fuels are broadly derived from biomass or captured carbon. Roadmap at 32. The Roadmap further assumes that emissions from biofuel production, equipment, and consumable resources are accounted for in the states in which they occur. Roadmap at 91-92. Finally, the Roadmap assumes that the re-use of waste products for fuel, such as crop residues, landfill gas, and woody debris, have zero emissions. Roadmap at 92. It does not examine the potential environmental impacts of different feedstocks or of biofuel blends that exceed 20 percent. As a possible remedy for these uncertainties, the Roadmap seems to suggest the use of credit standards, like those for the Renewable Energy Portfolio Standard, APS, and Clean Energy Standard, to ensure low and zero carbon fuels meet certain standards. Roadmap at 91.

The Roadmap and Energy Pathways Report also appear to favor biofuel use because they do not fully account for lifecycle emissions which, as discussed, is essential to assessing the environmental viability of biofuel. The 2050 Roadmap stresses that the Commonwealth will need to transition from a gross emissions accounting framework to a net accounting framework to accurately track the progress toward net zero, and that such a framework must account for emissions from burning biogenic fuels. Roadmap at 88. The Roadmap also argues that full

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<sup>20</sup> Miller, C. A., Characterizing Emissions from the Combustion of Biofuels. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/069, 2008.

[https://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?Lab=NRMRL&dirEntryId=191572](https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=191572).

<sup>21</sup> Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel, California Air Resources Board.

[https://www.arb.ca.gov/fuels/lcfs/ca-greet/tier1-bdrd-calculator-corrected.xlsm?\\_ga=2.4269299.1309740305.1606832068-1783880760.1605623460](https://www.arb.ca.gov/fuels/lcfs/ca-greet/tier1-bdrd-calculator-corrected.xlsm?_ga=2.4269299.1309740305.1606832068-1783880760.1605623460)

<sup>22</sup> Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel, California Air Resources Board.

[https://www.arb.ca.gov/fuels/lcfs/ca-greet/tier1-bdrd-calculator-corrected.xlsm?\\_ga=2.4269299.1309740305.1606832068-1783880760.1605623460](https://www.arb.ca.gov/fuels/lcfs/ca-greet/tier1-bdrd-calculator-corrected.xlsm?_ga=2.4269299.1309740305.1606832068-1783880760.1605623460)

<sup>23</sup> 225 CMR 16.02.

lifecycle emissions are not unique to biogenic fuels and may not be appropriate to include in a net emissions accounting framework, although it may consider accounting for “leakage” if the rise in biofuel use incentivizes deforestation in other states and reduces sequestration. Roadmap at 90. Given the amount of biofuel feedstock needed for building use in a heavy blending scenario and the current location of biofuel feedstocks in the short term, it is highly likely that most of the Commonwealth’s biofuel use would result from such leakage. With respect to imported biofuels, which may be in large demand by 2040, the Energy Pathways Report notes that the cost, quantity available, and environmental sustainability of imported biofuels are major uncertainties requiring further in-depth study. Energy Pathways Report at 8.

While the 2050 Roadmap acknowledges that net emissions impacts of different bioenergy feedstocks can vary, and appears to call for a carbon accounting approach that can distinguish these impacts, the document does not acknowledge that use of forest biomass is particularly undesirable due to its long carbon payback time. The modeling used in the Roadmap assumes a GHG emissions value of zero for biogenic fuels, including wood wastes. Roadmap at 91-92. Such an assumption is not compatible with the science on biogenic carbon accounting and is bound to skew modeled results to a more favorable assessment of biogenic fuels than is actually justified. As the inefficiency of bioenergy is a simple function of physical qualities such as fuel energy density and moisture, there is no basis for assuming that these factors will be mitigated by improvements in technology. Massachusetts must not assume that any biogenic feedstocks are “zero emission” or “net zero.”

3. *Ensure Commission and Task Force on Clean Heat have appropriate direction.*

- **Ensure Commission and Task Force mandate is limited to electrification pathway;**
- **Revise Commission and Task Force mandate to require consideration of zero up-front capital solutions for moderate income residents on a sliding scale up to 120 percent of area median income or state median income;**
- **Provide short-term, specific policies to guide building sector in aggressive transition; and**
- **Incorporate recommendations from IAC and CJWG reports.**

Strategy B3 also establishes the Commission and Task Force on Clean Heat. CECP at 33. The Commission and Task Force are charged with addressing a host of heating decarbonization concerns, but their chief task is to propose statutory, regulatory, and financing mechanisms to facilitate the transition to clean heating technologies. CECP at 33. The CECP can improve the efficacy and impact of the Commission and Task Force in two ways. First, to ensure that the Commission and Task Force put the Commonwealth on a path to net zero by 2050, the CECP should explicitly limit their activities to pursuing an electrification pathway rather than biofuel blending. Second, the Commission’s mandate should be amended to account for moderate income residents. Specifically, the Commission is currently required to consider zero up-front capital solutions for low income and affordable housing residents. CECP at 33. The Mass Save program already achieves these solutions for low-income and affordable housing residents. No

such solution exists, however, for moderate-income residents. This mandate should be revised to require consideration of “Zero up-front capital solutions for moderate income residents on a sliding scale up to 120 percent of area median income or state median income.”

Finally, Strategy B3 notes that reducing emissions in the building sector requires an aggressive pace, as compared to other sectors, due to the slow building equipment turnover rate. CECP at 33-34. The CECP concludes that the building sector caps are best achieved without dictating the means or technology by which to do so. CECP at 33. This approach counterintuitively assumes that a lack of direction will allow the building emissions sector to reduce emissions more rapidly. The CECP should consider providing short-term, specific policies that will allow the building sector to begin to quickly transition equipment that reaches its end of life in the next decade. These policies should include the following recommendations of the CJWG:

- Impose mandatory GHG emissions reduction limits on the building sector statewide by 2025, either through a MMTCO<sub>2</sub>e intensity per square feet building performance standard or a carbon fee on utility bills, with a substantial portion of the revenue returned to low- and moderate-income households).
- Set a mandatory threshold for the percentage of space heating and cooling and water heating that comes from renewable and highly-efficient clean electric sources.
- Establish a financing program or climate bank for building sector decarbonization by 2025 to fund deep energy retrofits, equitable workforce development, local and district-scale projects, renewable energy generation, and GHG reduction and climate adaptation.
- Add equity standards to the State Building Code, such as considering a project’s impact on affordability and pollution, the ethical sourcing of materials, and living wages for workers.
- Set annually-increasing targets for serving populations traditionally underserved by Mass Save.
- Provide incentives to transition congregate settings and individual households within EJ populations to clean heating and cooling and align incentives between landlords and renters.
- Ensure building code enforcement and resident education, particularly in EJ populations, and ensure high performing buildings in EJ populations.
- Revise energy efficiency guidelines to account for improved air quality, public health, and worker rights.
- Assess building sector policies for their cross-sector, cumulative impacts to reduce associated burdens and increase benefits for EJ populations, including the prevention of displacement.

## Chapter 4. Transforming our Energy Supply

The Commonwealth should be aiming to reduce GHG emissions from the electric sector as much as possible as soon as possible to ensure sufficient emissions reductions as the buildings and transportation sectors electrify.

### Summary Table of CLF Electricity Sector Recommendations

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
<b>N/A new Strategy needed</b>	Address the negative impacts of energy infrastructure siting on EJ populations.	Legislative changes are required. We support <a href="#">HD3679</a> , <a href="#">SD1418</a> ; Regulatory amendments are also required.
<b>Section 4.2 Strategy E1: Fill Current Standards &amp; Execute Procurements</b>	Use this opportunity to make more significant progress, rather than limiting to existing goals, such that future circumstances do not impinge on program success.	Possible need for changes to regulations.
	Reform existing programs to remove polluting combustion technology.	Legislation is required.
<b>Section 4.2 Strategy E2: Develop &amp; Coordinate Regional Planning and Markets</b>	Establish metrics for determining what changes the Commonwealth needs to see from ISO-NE to be satisfied that the ISO is acting in alignment with the Commonwealth's goals, as well as a timeline for such achievement.	Possible need for legislative or regulatory amendment.
	Establish an alternate strategy for decarbonizing Massachusetts' electric grid if it becomes apparent the ISO will not make significant changes to ensure alignment with the Commonwealth's climate goals.	Legislative changes likely required.
	Ensure that energy infrastructure is not sited near EJ populations except with adequate cumulative impacts review and process.	Legislative changes are required. We support <a href="#">HD3679</a> , <a href="#">SD1418</a> ; Regulatory amendments are also required.
<b>Section 4.2 Strategy E3: Align Attribute Markets with GWSA Compliance</b>	Adopt a mechanism to ensure timely decarbonization of municipal light plans.	Legislation is not required, but would be appropriate; regulatory amendments are necessary.



GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
	Focus review of market mechanisms on environmental justice outcomes.	Legislation is not required, but would be appropriate; regulatory amendments are necessary.
	Eliminate combustion technologies, including biomass from RPS and CES markets.	Legislation is required.
	Incorporate accounting for GHG emissions from large hydro projects into CES and inventory.	Amended regulations are required.
	Incorporate demand reduction strategies into the CECP.	Regulatory amendments are required.
	Direct EEA and DOER to end attribute markets' subsidies for energy purchased from high heat waste facilities.	Legislation would be beneficial; regulatory amendments are required.
	Phase out existing high heat facilities and prohibit the development of new high heat waste facilities.	Legislation would be beneficial; regulatory amendments are required.
	Require existing MWCs to comply with current emissions standards and, if they are unable to do so, to complete the technology upgrades necessary to cause the MWC to comply with emissions standards.	Legislation would be beneficial; regulatory amendments are required.
	Support legislation, regulations, and policies that encourage waste reduction and diversion.	Legislation, regulations, and guidance are required.
<b>Section 4.2 Strategy E4:</b> <i>Continue to Deploy Solar in Massachusetts</i>	Develop geospatial plan to ensure appropriate solar siting and incentivize siting solar near where it is needed.	No legislation or regulations are required.
	Adopt a "traffic light" approach to solar siting.	No amended regulations are necessary, but DOER guidance would be helpful.
	When siting solar on agricultural land, preserve the opportunity for food production and other agricultural dual-use options.	Possible need for legislative or regulatory amendment.

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
<b>Section 4.2 Strategy E5:</b> <i>Develop a Mature Offshore Wind Industry in Massachusetts</i>	Ensure at least 6GW of responsibly sited OSW is constructed or procured by 2030.	Legislation is needed.
<b>Section 4.2 Strategy E6:</b> <i>Incorporate GWSA into Distribution-Level Policy Considerations</i>	Increase level of detail on EEA’s plan to modernize the electric grid.	No legislation or regulations are required; a DPU order is necessary.
	Ensure that modernization of electric grid benefits low- and moderate-income consumers and does not result in increased energy costs;	No legislation or regulations are required; a DPU order is necessary.
	Develop grid modernization and rate design with input from community groups.	No legislation or regulations are required; a DPU order is necessary.
	Support expansion of microgrids and renewable energy cooperatives.	Possible need for legislative or regulatory amendment.

### CLF Recommendations to Strengthen Electricity Sector Strategies Overall

- **Make meaningful progress on addressing the disproportionate impacts of siting fossil fuel facilities near EJ populations.**

The CECP should emphasize the need for meaningful public engagement as the Commonwealth procures and develops standards for clean energy. It should also highlight the air quality and health benefits offered by clean energy resources. We recommend that the CECP acknowledge that existing fossil fuel communities are disproportionately sited near EJ populations. To begin to redress the disproportionate siting, we recommend a new strategy action requiring a project proponent to consult with the Massachusetts Environmental Policy Act (“MEPA”) Office (the “MEPA Office”) at least 60 days prior to filing and before an applicant files a petition with the Energy Facilities Siting Board. A 60-day advance notice period will allow time for a project proponent and the MEPA Office to develop an outreach strategy and then to allow time to conduct outreach prior to filing with the MEPA Office.

As part of this outreach strategy, the Proponent must be required to develop a written Project statement about the facility that includes detailed information about: the project need; public health, environmental, energy, economic, and climate risks and burdens; and public health, environmental, energy, economic, and climate benefits for communities within two miles of the facility. The project statement shall include reasonable alternatives. The project statement shall be shared with the EEA Director of Environmental Justice and posted to a public

website. If the Project will potentially impact an EJ population that is designated as limited English proficiency, then the MEPA Office shall provide guidance to the Proponent about the language(s) in which the Proponent should translate the project statement.

Early engagement between a proponent and the potentially impacted community prior to filing will likely require more preparation and planning for a proponent, but it could be an opportunity to improve a project and save time during the remainder of the environmental review. Within 30 days of submitting the Project statement, the Proponent shall invite community-based organizations, local elected officials, the EEA Director of Environmental Justice to a meeting to review the proposed project (“Information Meeting”). Based on guidance from the MEPA Office, the Proponent shall invite language interpreters, paid for by the Proponent, to ensure that Information Meeting attendees understand the terms of the project. During the Information Meeting, the Proponent shall review the Project statement, answer questions, and listen to attendee concerns and ideas. Following an information meeting, the Proponent shall adjust the Project that address community concerns or abandon plans to file with the MEPA Office. The MEPA Office shall ensure that staff is available to support a Proponent during the early engagement period to make connections with potentially impacted EJ populations.

Beyond early engagement, we anticipate implementation of S.9, if enacted, to further require permitting and approval processes to integrate EJ population consideration of fossil fuel facilities siting. We also support proposed legislation, [HD3679](#), [SD1418](#), and regulatory amendments to prevent the disproportionate impacts of fossil fuel facilities in EJ populations.

The “Social Cost of Carbon” must be accounted for when evaluating the impact of GHG pollution and included in any cost benefit analysis of electric sector regulations and proposed new electric generation facilities. Additionally, the health impacts of pollutants that co-occur with GHG emissions from combustion must be addressed by comparing emissions accounting of such pollutants in areas with EJ populations and areas without EJ populations. Lastly, the Commonwealth must provide support for municipal light plants to evaluate and respond to climate justice considerations in their own operations.

### CLF Recommendations to Strengthen Strategy E1 (Fill Current Standards & Execute Procurements)

- **Use this opportunity to make more significant progress, rather than limiting to existing goals, such that future circumstances do not impinge on program success; and**
- **Reform existing programs to remove polluting combustion technology.**

Strategy E1 of the CECP notes that existing solar programs and procurement of offshore wind (“OSW”), when completely executed, would align with the scale of renewable energy growth contemplated in the Roadmap. CECP at 38. This strategy fails, however, to contemplate the possibility that the Commonwealth could achieve more aggressive goals, especially given uncertainty on what federal leadership on climate may be in the future. The Commonwealth should consider this an opportunity to get ahead of the ball, such that our climate goals will be

met even in the event of future impediments. In particular, DOER should have specific instructions to monitor technology costs and increase procurements and incentives if new information demonstrates that the cost of technology becomes less prohibitive before the modeling laid out in the Roadmap presently assumes it might be.

Additionally, this strategy's focus on compliance with existing programs ignores the Commonwealth's dire need to reform existing programs to eliminate combustion technologies and grapple with outdated ideas about the climate impact of combustion technology like woody biomass and waste combustion for electricity. CECP at 38. This issue is discussed further below in reference to Strategy E3.

### CLF Recommendation to Strengthen Strategy E2 (Develop and Coordinate Regional Planning and Markets)

- **Establish metrics for determining what changes the Commonwealth needs to see from ISO-NE to be satisfied that the ISO is acting in alignment with the Commonwealth's goals, as well as a timeline for such achievement;**
- **Establish an alternate strategy for decarbonizing Massachusetts' electric grid if it becomes apparent the ISO will not make significant changes to ensure alignment with the Commonwealth's climate goals; and**
- **Ensure that energy infrastructure is not sited near EJ populations except with adequate cumulative impacts review and process.**

Strategy E2 focuses on the need for regional cooperation to plan for new transmission capacity, and the need to calibrate the pace of project approvals so that costs and revenues in the Clean Energy Standard ("CES") and Renewable Portfolio Standard ("RPS") energy certificate markets align. CECP at 38-39. To meet the Commonwealth's decarbonization goals, EEA will need to secure a commitment from ISO-NE to shift its planning paradigm and market design to meet those goals. The six New England states are committed to decarbonizing the electricity sector, and through their NESCOE Vision programming have sought out mechanisms and opportunities for aligning the region's electric grid and energy resources with the region's goals relating to climate change. CECP at 39.

This strategy falls short mostly due to factors not fully within the Commonwealth's control. The Commonwealth must prepare to modify its commitments if the regional structure fails to enact the changes needed to meet our requirements. ISO-NE's technology-neutral approach to short term electric system reliability has become an active impediment to the region's achievement of our collective decarbonization goals. Further, the pace of decarbonization necessary to meet the Commonwealth's goals may not be achieved by consensus among the New England states. The Commonwealth should determine, as soon as is practicable, what metrics it will use to determine if, when, and how the ISO has shifted its planning and market processes sufficiently to advance decarbonization goals. The Commonwealth should then be prepared to make the switch to an alternative strategy if, after

a specified amount of time, it is apparent that the ISO's efforts to come into alignment with the Commonwealth's climate goals are insufficient.

In addition, any proposed solutions contemplated under this section should include consideration of environmental justice populations, as was recommended by the CJWG. Future electric and gas distribution system infrastructure should not be sited near EJ populations, except after completion of cumulative impact reviews for such projects that include consideration of potential public health impacts and long-term harms, as well as meaningful community engagement processes wherein community concerns and ideas inform and influence decision-making at the initiation of the project proposal process.

### CLF Recommendations to Strengthen Strategy E3 (Align Attribute Markets with GWSA Compliance)

#### 1. *Clean Energy Recommendations for Strategy E3.*

- **Adopt a mechanism to ensure timely decarbonization of municipal light plants;**
- **Focus review of market mechanisms on EJ outcomes and long term goals;**
- **Take all necessary steps to eliminate combustion technologies, including woody biomass, from RPS and CES markets; and**
- **Incorporate accounting for GHG emissions from large hydro projects into CES and inventory;**
- **Incorporate demand reduction strategies into the CECP.**

Strategy E3 notes that municipal light plants are not currently subject to attribute market mechanisms like the RPS or CES. CECP at 39-40. The Commonwealth needs to determine a mechanism for the timely decarbonization of municipal light plants.

This strategy also calls for review of current attribute markets. CECP at 40. This review will be incomplete and insufficient if it fails to focus on EJ outcomes and the elimination of combustion technology from those markets. To meet any version of its environmental and climate justice goals and the 2050 net zero requirement, EEA must commit to working with the legislature to make the statutory changes necessary to remove harmful and polluting technology like woody biomass combustion from its renewable energy incentive programs. Such review should occur as soon as practicable and be repeated at five-year intervals to ensure that the latest scientific understanding of the impact of incentivized technologies is captured, and to allow for new technology options to be added.

It is far beyond time for Massachusetts to stop attempting to engineer economic development for the woody biomass industry at the cost of the health of the people who live near inefficient and highly polluting woody biomass combustion facilities.<sup>24</sup> For instance,

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<sup>24</sup> For detailed discussion of the unsuitability of woody biomass for clean electricity technology incentives, see CLF, et al., Joint Environmental Comments on Proposed Changes to the Biomass Regulations in the Renewable Energy Portfolio Standard (July 26, 2019).

Palmer Renewable Energy LLC's proposed biomass facility in East Springfield, Massachusetts, would further threaten the health of a community that already struggles with significant and hazardous air pollution that degrades their air quality. Springfield experiences an above average number of high ozone days each year and has been named the number one Asthma Capital by the Asthma and Allergy Foundation of America.<sup>25</sup> Even though the RPS statute requires biomass plants to be low emission and use advanced technologies, when a facility is poorly sited, as is the case with the proposed Palmer plant in Springfield, incentivizing any level of additional particulate emissions is a dangerous policy choice and not credible in light of the statutory requirement for low emissions. The air permit for the proposed plant allows it to emit 34.55 tons of particulate matter and 13.2 tons of hazardous air pollutants annually, which includes heavy metals and carcinogens like formaldehyde and benzene.<sup>26</sup> In a community overburdened with poor air quality, building even a "low emission" biomass plant would only exacerbate the problem, adding damaging fine particulates and hazardous air pollutants where they can least be afforded.

In the review of attribute markets, EEA must also account for the GHG emissions associated with other technologies incentivized or compensated under the CES, including hydropower. MassDEP should require reporting of the GHG emissions from the electricity production by electricity retailers of hydroelectric or importers or producers, and the reported emissions should be included in the annual GHG inventory.

The CECP asserts the need to maintain pressure on regional markets by raising clean energy delivery obligations such that new clean generating sources continue to be developed. CECP at 40. Given the historic value of the CES as a means for the Commonwealth to capture the clean or renewable energy attributes of electricity purchased by Massachusetts electric customers through procurements or the wholesale market rather than driving the development of new generation, the level of the CES should be calibrated periodically to ensure that we are capturing all of the GHG emissions accounting value that our public policy-based electricity procurements are creating.

There is also a role for electricity attribute programs to help reduce the overall peak installed capacity of our electric generation system. The CECP should require MassDEP to explore amendments to the CES that would spur utilities to plan for peak demand reduction, including combined strategies such as energy storage systems, time-of-use rates, and energy efficiency services. This would help fill a gap between the Mass Save program (which encourages overall demand reduction) and the Clean Peak Standard (which attempts to encourage use of lower emitting sources to meet peak demand).

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<sup>25</sup> Am. Lung Ass'n, State of the Air 2019, Massachusetts: Hampden (2019) (air quality report for Hampden County), <https://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/states/massachusetts/hampden.html>; Asthma & Allergy Found. of Am., Asthma Capitals 2019: The Most Challenging Places to Live with Asthma (2019), note 15, at 6, <https://www.aafa.org/media/2426/aafa-2019-asthma-capitals-report.pdf>.

<sup>26</sup> MassDEP Conditional Air Permit for PRE Proposed Biomass-Fired Power Plant at 1000 Page Boulevard in Springfield, MA 15 (June 30, 2011), [http://www.pfpi.net/wp-content/uploads/2019/05/Palmer-Renewable-Energy-Non-Major-Conditional-Plan-Approval\\_06\\_30\\_11-FINAL.pdf](http://www.pfpi.net/wp-content/uploads/2019/05/Palmer-Renewable-Energy-Non-Major-Conditional-Plan-Approval_06_30_11-FINAL.pdf).

2. *Waste-specific Recommendations for Strategy E3.*

- **Direct EEA and DOER to end attribute market subsidies for energy purchased from high heat waste facilities;**
- **Phase out existing high heat facilities and prohibit the development of new high heat waste facilities;**
- **Require existing MWCs to comply with current emissions standards and, if they are unable to do so, to complete the technology upgrades necessary to cause the MWC to comply with emissions standards; and**
- **Support legislation, regulations, and policies that encourage waste reduction and diversion.**

The combustion of petroleum-based municipal solid waste (e.g., plastics) at Massachusetts' seven municipal waste combustors ("MWC") is the largest source of emissions from the solid waste stream. Roadmap at 70. From 2010 to 2018, total CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O Emissions from municipal solid waste ("MSW") combustion for the electric sector have decreased from 2,426,817 to 1,163,977 MMTCO<sub>2</sub>e, a 52 percent reduction.<sup>27</sup> During the same period, total CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from MSW combustion for the industrial sector have almost doubled from 22,320 to 40,954 MMTCO<sub>2</sub>e, an increase of 83.4 percent.<sup>28</sup>

Landfills similarly contribute GHG emissions. From 2010 to 2018, total methane emissions from Massachusetts landfills declined from 449,850 to 304,408 MMTCO<sub>2</sub>e.<sup>29</sup> That is a 32.3 percent decrease. In the same period, CO<sub>2</sub> oxidation emissions from MSW landfills and emissions flares, engines and turbines at landfills (not already accounted for in electric sector) have decreased at varying rates.<sup>30</sup>

In Strategy E3, the CECP notes that emissions from the electricity system in 2030 are expected to arise, in part, from municipal solid waste combustion. CECP at 39. The CECP implores EEA and DOER to review current attribute markets (including the RPS and APS) to "ensure those programs continue to support 'on pace' clean energy deployment in a strategic, cost effective way". CECP at 40. In Strategy N2, the CECP recognizes that the current major source of emissions from solid waste disposal is the Commonwealth's seven MWCs. CECP at 47. Strategy N2 articulates a twofold plan to stabilize these emissions. First, it relies on the Draft 2030 Solid Waste Master Plan ("Draft SWMP") to divert materials and reduce the Commonwealth's waste management needs. CECP at 47. Second, it would require MassDEP to establish tighter emissions and increased efficiency standards if an MWC seeks to modify or rebuild its facility. CECP at 47.

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<sup>27</sup> Massachusetts Greenhouse Gas Emissions Inventory, 1990-2017 with partial 2018 data. <https://www.mass.gov/doc/appendix-c-massachusetts-annual-greenhouse-gas-emissions-inventory-1990-2017-with-partial-2018/download>.

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

<sup>30</sup> *Id.*

In both Strategy Actions E3 and N2, the CECP should re-frame its approach to solid waste and high heat waste disposal facilities to: (1) phase out the use of existing high heat facilities; (2) ensure that no new high heat facilities are built; and (3) support waste reduction and diversion policies to reduce the amount of banned materials from entering our MWCs or landfills. For purposes of these comments, “high heat facilities” refers to any processing facility that uses or results in the use of high heat, including incineration, pyrolysis, gasification, plasma arc, and chemical recycling, to dispose of waste. For instance, a proposed biosolids gasification facility in Taunton was technically not classified as an incinerator by the EPA.<sup>31</sup> While incineration does not occur on site, the constituent particles produced by the facility’s gasification process would be incinerated off-site and consequently contribute to the negative environmental and health impacts of high heat described herein.

a. High heat facilities are a false solution to waste reduction and harm the environment and public health.

High heat facilities in the Commonwealth, including its seven MWCs, are toxic, harmful, and unnecessary. First, MWCs produce GHG emissions, particulate matter, and ash that is harmful to public health and the environment.<sup>32</sup> Second, six of the seven MWCs are located near EJ populations, which are already overburdened with pollution, experience negative public health impacts, and often lack access to environmental benefits, such as renewable energy and green spaces. Third, aging MWCs cost more to operate and maintain than other forms of electricity generation and provide fewer jobs than alternatives such as composting and recycling.<sup>33</sup> The Commonwealth’s MWCs have also outlasted their useful lifespans and require significant, disruptive, and expensive repairs.<sup>34</sup> Finally, MWCs are not needed to dispose of the Commonwealth’s solid waste. Pursuing zero waste alternatives, such as composting and

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<sup>31</sup> Aries Clean Energy, Taunton Biosolids Gasification Project: Presentation to City Council (December 29, 2020), [https://www.taunton-ma.gov/sites/g/files/vyhlf1311/f/uploads/aries\\_taunton\\_council\\_presentation\\_final\\_12-29-20.pptx](https://www.taunton-ma.gov/sites/g/files/vyhlf1311/f/uploads/aries_taunton_council_presentation_final_12-29-20.pptx).

<sup>32</sup> See, e.g., Energy Justice Network, *Trash Incineration More Polluting Than Coal*, <http://www.energyjustice.net/incineration/worsethancoal>; Environmental Integrity Project, *Dirtying Maryland’s Air by Seeking a Quick Fix on Renewable Energy?*, pp. 3–8 (2011), <http://www.environmentalintegrity.org/wp-content/uploads/2016/11/FINALWTEINCINERATORREPORT-101111.pdf>; The New School, *U.S. Municipal Solid Waste Incinerators: An Industry in Decline* at 34 (2019), [https://tishmancenter.org/wp-content/uploads/2019/05/CR\\_GaiaReportFinal\\_05.21.pdf](https://tishmancenter.org/wp-content/uploads/2019/05/CR_GaiaReportFinal_05.21.pdf); U.S. EPA, *Municipal Solid Waste in the United States: 2011 Facts and Figures*, pp. 143–44 (2013), [https://archive.epa.gov/epawaste/nonhaz/municipal/web/pdf/mswcharacterization\\_fnl\\_060713\\_2\\_rpt.pdf](https://archive.epa.gov/epawaste/nonhaz/municipal/web/pdf/mswcharacterization_fnl_060713_2_rpt.pdf).

<sup>33</sup> U.S. Energy Information Administration, *Updated Capital Cost Estimates for Electricity Generation Plants at 7* (2010), <http://large.stanford.edu/courses/2018/ph241/wang-k2/docs/eia-nov10.pdf>; Tellus Institute, *More Jobs, Less Pollution: Growing the Recycling Economy in the U.S.*, pp. 34–35 (2011), [https://www.nrdc.org/sites/default/files/glo\\_11111401a\\_0.pdf](https://www.nrdc.org/sites/default/files/glo_11111401a_0.pdf).

<sup>34</sup> Abraham, Y., “It’s time for the nation’s oldest trash incinerator, in Saugus, to go,” *Boston Globe*, (Jan. 23, 2021), <https://www.msn.com/en-us/news/us/it-s-time-for-the-nation-s-oldest-trash-incinerator-in-saugus-to-go/ar-BB1d1XfG>. See Budris, K., “Aging Waste Incinerators Post a Danger to New Englanders: Burning Our Trash Pollutes More, Costs More, Deepens Entrenched Inequalities,” Conservation Law Foundation, (Dec. 9, 2019), <https://www.clf.org/blog/aging-incinerators-pose-a-danger/>.



recycling, could divert the majority of materials from going to landfills or MWCs.<sup>35</sup> In 2019, paper, plastic, metal, glass, or organic material, most of which could have been recycled or composted, accounted for at least 70 percent of the municipal solid waste incinerated in Massachusetts.<sup>36</sup> MWCs are an inefficient use of energy. Zero waste practices such as source reduction, recycling, and composting conserve three to five times more energy, per ton of waste, than incineration can generate.<sup>37</sup>

Finally, the use of pyrolysis, gasification, plasma arc, chemical recycling, and incineration represent false solutions to the plastic waste reduction crisis because they do not fit into the "circular economy" of plastic waste.<sup>38</sup> Rather than produce new plastic, these processes produce either fuel that is combusted off-site or air emissions.<sup>39</sup> This means that additional fossil fuels are needed to manufacture virgin plastics.<sup>40</sup> The final CECP should prohibit the approval of new high heat facilities.

b. Phase out existing high heat facilities and prohibit development of new facilities.

The CECP should strengthen Strategy Action E3 to phase out the use of high heat combustion by eliminating attribute markets' subsidies for energy generated through high heat processes, including MWCs. As noted above, MWCs do not produce renewable energy<sup>41</sup> and should not benefit from programs intended to support renewable energy. The CECP should also support amendments to regulation 310 CMR 16.00 that would phase out incinerators. Similarly, to put the Commonwealth on track to meet its 2050 goals, the CECP should seek to prohibit the development of new facilities that employ high heat technologies to dispose of solid waste. EEA expects that the volume of waste to be processed by the Commonwealth's existing MWCs will decrease, underscoring the lack of need for additional facilities. CECP at 47. The CECP should indicate the potential need for legislation that would achieve this goal. In the alternative, the CECP should direct MassDEP to propose regulatory amendments to 310 CMR 16.00 which would accomplish this as well.

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<sup>35</sup> See Massachusetts Department of Environmental Protection, Overall Waste Composition By Primary Material Category—Winter and Fall 2016 Sampling, <https://www.mass.gov/doc/summary-of-waste-combustor-class-ii-recycling-program-waste-characterization-studies-includes/download>; see also Tellus Institute, *supra* note 28, at 1.

<sup>36</sup> See Massachusetts DEP, Overall Waste Composition By Primary Material Category—Spring and Summer 2019 Sampling, <https://www.mass.gov/doc/summary-of-waste-combustor-class-ii-recycling-program-waste-characterization-studies-includes/download>.

<sup>37</sup> Marie Donahue, Institute for Local Self-Reliance, Waste Incineration: A Dirty Secret in How States Define Renewable Energy at 11 (2018), <https://ilsr.org/wp-content/uploads/2018/12/ILSRIncinerationFinalDraft-6.pdf>.

<sup>38</sup> Rollinson, A., Oladejo, J., Chemical Recycling: Status, Sustainability, and Environmental Impacts. *Global Alliance for Incinerator Alternatives*. doi:10.46556/ONLS4535, at 11 (2020), at 11. [https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment\\_June-2020.pdf](https://www.no-burn.org/wp-content/uploads/CR-Technical-Assessment_June-2020.pdf).

<sup>39</sup> *Id.* at 8.

<sup>40</sup> Global Alliance for Incinerator Alternatives, Chemical Recycling: Distraction, Not Solution, at 7 (2020), at 7. [https://www.no-burn.org/wp-content/uploads/CR-Briefing\\_June-2020.pdf](https://www.no-burn.org/wp-content/uploads/CR-Briefing_June-2020.pdf).

<sup>41</sup> See Tellus Institute, Assessment of Materials Management Options for the Massachusetts Solid Waste Master Plan Review at 9, 11 (2008), [https://www.tellus.org/pub/Final\\_Report\\_Materials\\_Management\\_Options\\_for\\_MA\\_SW\\_Master\\_Plan\\_Review\\_-\\_With\\_Appendices\\_-\\_12-08.pdf](https://www.tellus.org/pub/Final_Report_Materials_Management_Options_for_MA_SW_Master_Plan_Review_-_With_Appendices_-_12-08.pdf). See also U.S. EPA, Solid Waste Management and Greenhouse Gases, a Life-Cycle Assessment of Emissions and Sinks at 76 (3d ed. 2006).

With respect to Strategy Action N2, while the proposal that MWCs meet higher emissions standards if they seek to modify their facilities is a positive step, it is unlikely that MWCs will be able to meet any such emissions standards. CECP at 47. The Commonwealth's MWCs already struggle to meet existing emissions standards, even with regular repairs. For instance, the 45-year-old Wheelabrator Saugus, during shutdown operations in 2018, emitted average concentrations of carbon dioxide and sulfur dioxide that significantly exceeded the incinerator's Air Quality Operating Permit emissions limits.<sup>42</sup> Similarly, the Saugus incinerator is permitted to comply with the NOx limits set forth in 310 CMR 7.08(2)(f)3 by purchasing emission reduction credits, rather than decreasing the NOx emissions it actually releases.<sup>43</sup> Finally, as discussed above, MWCs are toxic and unsustainable generating facilities that are primarily situated in overburdened EJ populations and are currently accepting significant amounts of solid waste that is legally required to be diverted. Strategy Action N2 should also require existing MWCs to comply with current emissions standards and, if facility operators are unable to do so, to complete the technology upgrades necessary to cause each MWC to comply with emissions standards in lieu of purchasing emission reduction credits.

c. Emphasize waste reduction and diversion policies.

Reducing and diverting waste is critical to phasing out high heat facilities and reducing methane production at landfills. Once an MWC is built, it requires a certain level of waste inputs to remain profitable.<sup>44</sup> A state or municipality may be contractually obligated to provide a certain level of waste to the incinerator.<sup>45</sup> In a practical sense, a municipality that has relied on an MWC for years, if not decades, may be disinclined from pursuing zero waste policies that would disrupt the status quo and require the municipality to devote time and resources to the development of new policies. In these ways, the continued existence of high heat facilities guarantees a consistent level of waste generation and will prevent the adoption of waste reduction and diversion policies.<sup>46</sup> While all operating Massachusetts landfills are planned to close by the early 2030s, these sites will continue to produce methane as a result of slowly decaying organic matter, mostly food waste. Roadmap at 70. Discarded food that ends up in landfills unnecessarily releases GHG emissions.

The Commonwealth has, in recent years, failed to achieve a meaningful reduction in waste. Over the last ten years, the disposal rate has remained flat despite increased diversion of food scraps, the decline of hard copies of newspapers, and the practice of "light loading" (making lighter plastic containers).<sup>47</sup> Specifically, the Commonwealth generated roughly 5.4

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<sup>42</sup> Emissions data can be retrieved at <http://eeaonline.eea.state.ma.us/DEP/MWC/facilityReport>. Aspx; Final Air Quality Operating Permit MBR-95-OPP-011A5 at 5, <https://www.mass.gov/files/documents/2019/06/27/op-wheels.pdf>.

<sup>43</sup> See Emission Control Plan Modified Approval at 5-6, <https://eeaonline.eea.state.ma.us/EEA/PublicApp/#>.

<sup>44</sup> See Muznik, S., Deliver or Pay, or how waste incineration causes recycling to slow down, Zero Waste Europe, <https://zerowasteurope.eu/2017/10/deliver-pay-waste-incineration-causes-recycling-slow/>.

<sup>45</sup> *Id.*

<sup>46</sup> See Taxonomy Technical Report, EU Technical Expert Group on Sustainable Finance at 292 (June 2019). [https://ec.europa.eu/info/sites/info/files/business\\_economy\\_euro/banking\\_and\\_finance/documents/190618-sustainable-finance-teg-report-taxonomy\\_en.pdf](https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/190618-sustainable-finance-teg-report-taxonomy_en.pdf).

<sup>47</sup> See 2019 Solid Waste Data Update, Department of Environmental Protection, at 3 (Oct. 2019). <https://www.mass.gov/doc/2019-solid-waste-data-update/download>.

million tons of solid waste disposal in 2010 and roughly 5.5 million tons in 2019.<sup>48</sup> While there has also not been a marked increase in waste given that the economy has improved since 2008-09,<sup>49</sup> this is a highly concerning lack of progress. Without more action by the Commonwealth, this trend suggests that waste levels will remain stagnant through 2030, contrary to the CECP's expressed expectation.

CECP Strategy Action N2 recognizes that waste reduction is needed to stabilize emissions from MWCs over the next decade. CECP at 47. Reliance on the Draft SWMP, however, is insufficient to achieve its 2030 emissions goals with respect to solid waste. Notably, since the Draft SWMP is not enforceable, there is no assurance that its waste reduction goals will be realized. Furthermore, it lacks incentives and enforcement mechanisms, making it less likely that its goals will be achieved. In addition, its waste reduction goals are too distant and conservative. The Draft SWMP proposes a diversion of 90 percent of current waste by 2050, with a shorter-term goal of reducing waste by 30 percent per decade. Draft SWMP at 7-8. To reduce the need for MWCs, the CECP should supplement the Draft SWMP by supporting the following policies, regulations, and legislation that incentivize waste reduction and divert waste from high heat facilities and landfills:

1. Municipal unit-based pricing policies, such as Pay-As-You-Throw, which are successful in reducing municipal waste disposal rates by 42-54 percent.<sup>50</sup>
2. Container deposit return laws that pay redemption fees to consumers and cover a broad variety of covered containers divert more materials and lead to more recycling that produces better quality materials than curbside recycling programs, all at no expense to taxpayers.<sup>51</sup> The CECP should direct the Administration to support HD.4039/SD.2483, currently pending before the legislature.
3. Producer responsibility for packaging policies which, if properly designed, can spur reduction, recycling, and redesign of material so they are reusable or more recyclable. The CECP should direct MassDEP to support HD.1553/SD.1123, which is currently pending before the legislature.
4. Amendments to regulation 310 CMR 16.00 that would phase out incinerators.
5. Amendments to regulation 310 CMR 19.00 that would strengthen existing food waste bans and create residential food waste bans. Banning the disposal of food scraps would decrease Massachusetts' disposal tonnage by one to two million

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<sup>48</sup> *Id.*

<sup>49</sup> See Draft Massachusetts 2030 Solid Waste Master Plan, Department of Environmental Protection, at 3 (Sept. 2019). <https://www.mass.gov/doc/draft-2030-solid-waste-master-plan/download>.

<sup>50</sup> See UNH Research Finds Pay-As-You-Throw Trash Policies Cut Solid Waste Disposal (November 5, 2018), <https://www.unh.edu/unhtoday/news/release/2018/11/05/unh-research-finds-pay-you-throw-trash-policies-cut-solid-waste-disposal>.

<sup>51</sup> See Jenny Gitlitz, U.S. Container Recycling Rates and Trends, Container Recycling Institute (Oct. 2013), Available at <https://www.legis.iowa.gov/docs/publications/SD/698850.pdf>.

tons, or 22-33 percent, each year.<sup>52</sup> MassDEP cannot meet the goals set in the Draft SWMP unless food scraps are banned entirely from disposal, and soon.

6. Enforcement of the waste bans established by 310 CMR 19.00, which could divert 40 percent of waste (excluding food scraps),<sup>53</sup> through the allocation of additional resources to support at least six full-time waste inspectors at MassDEP.

## CLF Recommendations to Strengthen Strategy E4 (Continue to Deploy Solar in Massachusetts)

- **Develop geospatial plan to ensure appropriate solar siting and incentivize siting solar near where it is needed;**
- **Adopt a “traffic light” approach to solar siting; and**
- **When siting solar on agricultural land, preserve the opportunity for food production and other agricultural dual-use options.**

Current solar programs are scheduled to sunset in about five years, but there is still a need for growth in solar energy, such that the system includes 40 gigawatts of solar resources by 2050. As noted in the CECP, expansion of the solar energy industry presents two major issues: interconnection and impact on natural lands. CECP at 40. The CECP unfortunately lacks any proposed solutions for the concerns raised in this section, such as incentives for research and development of solar technologies, extending current solar programs, or mandating solar roofing for new construction. The CECP should provide more specificity about how it intends to add any additional solar resources into the system, let alone an addition 40 gigawatts. When looking at the role of solar and other onshore resources to meet our goals, we need a geospatial plan for the location of solar installations, what is feasible on specific sites, and plans to eliminate barriers to building on brownfields and impervious surfaces. After creating this plan, the Commonwealth should then limit renewables siting on greenfields to ensure the least harm to such green spaces. The Commonwealth should develop a strong incentive to put solar technology where it can benefit the grid and has community support while avoiding siting where it is not needed.

The Commonwealth can support robust continued solar growth while protecting critical forest, agricultural, and other environmentally-significant lands and encouraging accelerated development of solar on developed land or through dual-use with agriculture. A comprehensive, common-sense approach to solar siting will encourage project developers to prioritize preferred siting locations and help residents understand solar development’s role in the landscape. To protect our most ecologically important lands while supporting solar development on marginal lands, CLF favors a “traffic light” land classification system designed

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<sup>52</sup> See Massachusetts Food System Collaborative, Food Waste Reduction, <https://mafoodsystem.org/projects/food-waste/>

<sup>53</sup> See Fischer, J., MassDEP Waste Ban Compliance and Enforcement (January 14, 2015), [http://www.newmoa.org/events/docs/147\\_137/MassDEPWasteBansJan2015.pdf](http://www.newmoa.org/events/docs/147_137/MassDEPWasteBansJan2015.pdf).

to fit with DOER’s existing category-based land use classification under the Solar Massachusetts Renewable Target (“SMART”) program. The “red” category includes lands with high ecological value, prime farmland, and open space that should be off limits to solar development. The “yellow” category includes some farm and forest lands that would be eligible for solar development but would require payment into a Solar Conservation Fund to help mitigate impacts. The “green” category includes disturbed lands, brownfields, rooftops, landfills, and dual use on agricultural lands that would be preferred locations for solar. CLF would be happy to provide additional details on this proposed approach, which we developed in partnership with American Farmland Trust, Vote Solar, and Acadia Center.

### CLF Recommendations to Strengthen Strategy E5 (Develop a Mature Offshore Wind Industry in Massachusetts)

➤ **Ensure at least 6GW of responsibly sited OSW is constructed or procured by 2030.**

OSW is a promising resource, but its development requires alignment of several moving parts by local, state, and federal governments, as well as with ISO-NE. In addition to needing to ensure that multiple factors synchronize appropriately, additional research into the impacts of OSW is necessary to determine the potential for adverse impacts on local fishing industries and marine wildlife. CECP at 42.

Significant OSW development, in existing and additional lease areas off the coast of Massachusetts, is necessary and the only plausible way to fully decarbonize the electric grid by 2050 at the latest. It is crucial that this OSW leasing and development is done responsibly. Responsible OSW development avoids, minimizes and mitigates impacts to ocean wildlife and habitat—including critically endangered species such as the North Atlantic right whale—as well as traditional ocean uses. Responsible OSW development also meaningfully engages stakeholders from the start and uses the best available science and data—including data from already developed projects—to ensure science-based and stakeholder-informed decision making. As Massachusetts seeks to identify new lease areas to meet its clean energy and decarbonization goals, it is essential that a diverse array of stakeholders are involved so that siting can occur in areas that will avoid, minimize, and mitigate impacts.

Responsibly sited OSW will be the linchpin of the Commonwealth’s ability to decarbonize. In addition to the six gigawatts of renewable energy that EEA will pursue between 2030 and 2040, Massachusetts’ OSW procurements should total a minimum amount of clean energy deployment by 2030. We recommend that Strategy E5 set a target of at least six megawatts by 2030. In addition to enabling the Commonwealth to meet more ambitious interim limits, additional procurements of OSW will ensure that we are able to access the benefits of the lease areas off of our shores as other large states south of New England ramp up their own aggressive OSW procurements.

## CLF Recommendations to Strengthen Strategy E6 (Incorporate GWSA into Distribution-Level Policy Considerations)

- **Increase level of detail on EEA’s plan to modernize the electric grid;**
- **Ensure modernization of electric grid benefits low- and moderate-income consumers and does not result in increased energy costs;**
- **Develop grid modernization and rate design with input from community groups;**
- **Prioritize opportunities for ownership of renewable energy assets in EJ populations; and**
- **Support expansion of microgrids and renewable energy cooperatives.**

The CECP notes that implementation of clean energy policies will result in a need for grid modernization and distributed system planning, which in turn will promote development of clean energy resources by removing barriers to entry. CECP at 43. The Commonwealth should add detail to the CECP to thoroughly lay out a plan for modernizing the grid. This could include what EEA expects from the ongoing DPU proceedings on grid modernization and distribution planning, as well as what other agencies and ISO-NE must achieve for this strategy to be successful. As the IAC and CJWG have previously recommended, grid modernization should benefit low and moderate-income customers and not result in increased energy costs, and programs and rate design should be developed in collaboration with community groups.

Additionally, the CECP should incorporate recommendations set forth by the IAC CJWG in the area of distributed energy resources. EJ populations need to be at the forefront of all proposals and strategies contemplated under the CECP. Removal of financial barriers and mandatory minimum participation in clean energy programs will give EJ populations the opportunity to access renewable energy generation, and financial incentives and regulatory carve-outs will encourage community shared distributed energy resources and microgrids in communities with EJ populations. EEA should develop programs to enable opportunities for individual and community ownership of distributed renewable energy assets like solar in communities with EJ populations.

## Chapter 5. Mitigating Other Sources of Emissions

Summary Table of CLF Non-Energy Sectors Recommendations

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
<p><i>N1: Target Non-Energy Emissions That Can Be Abated or Replaced</i></p>	<p>Support legislation, amend regulations, and develop additional programs to reduce methane leaks and eventually retire gas system infrastructure.</p>	<p>Legislation is not required; amended regulations are necessary.</p>
	<p>Amend regulations to establish annual methane limits from 2025-2030.</p>	<p>Regulations will need to be modified; statutory change may be required.</p>
	<p>Direct MassDEP to compare the most recent emissions results to previous results to accurately measure progress towards GWSA goals.</p>	<p>No legislation or regulations are required.</p>
	<p>Direct MassDEP to measure and monitor atmospheric methane levels.</p>	<p>No legislation or regulations are required.</p>
<p><i>N2: Implement Best Practices Around Residual Non-Energy Emissions</i></p>	<p>See Recommendations to Strengthen Strategy E3 (waste), above.</p>	<p>Legislation, amended regulations, and guidance are necessary.</p>
	<p>Fund the Healthy Soils Program.</p>	<p>No legislation or regulations are required.</p>
	<p>Direct MDAR to establish a baseline of data on soil carbon measurement in the Commonwealth.</p>	<p>No legislation or regulations needed; guidance may be helpful.</p>
	<p>Develop a program to incentivize farmers to adopt and maintain farming practices that drive carbon sequestration, improved water quality, and other benefits.</p>	<p>No legislation or regulations needed; guidance may be helpful.</p>

## CLF Recommendations to Strengthen Strategy N1 (Target Non-Energy Emissions That Can Be Abated or Replaced)

- **Support legislation, amend regulations, and develop additional programs to reduce methane leaks and eventually retire gas system infrastructure;**
- **Amend regulations to establish annual methane limits from 2025-2030;**
- **Direct MassDEP to compare the most recent emissions results to previous results to accurately measure progress towards GWSA goals; and**
- **Direct MassDEP to measure and monitor atmospheric methane levels.**

The CECP emphasizes that stabilizing and limiting the growth of non-energy emissions is an impactful strategy for the next decade. CECP at 45. The CECP also acknowledges that methane leaks from natural gas infrastructure are “substantial,” but it fails to recommend additional action to further curb such leaks. CECP at 46. Strategy N1 relies on MassDEP’s current regulation 310 CMR 7.73 and its coordination with gas companies’ Gas System Enhancement Plans and the eventual deployment of heat pumps to reduce gas leaks. CECP at 46. This approach overlooks the additional action necessary to eliminate methane leaks.

First, as discussed above in Strategy B3, MassDEP should amend regulation 310 CMR 7.73(4) to require distribution companies to repair gas leaks to achieve zero-emissions related to lost and unaccounted for gas or, in some cases, retire the pipe altogether. MassDEP should further amend 310 CMR 7.73(9) to establish annual methane limits from 2025-2030.

Second, the CECP should address how the Commonwealth’s legislature can play a role in reducing methane leaks. Several bills, An Act relative to eliminating gas leaks (SD.2188/HD.3552) and An Act relative to the future of heat in the Commonwealth (SD.2340/HD.3472), that are pending before the Massachusetts legislature would offer additional solutions and incentives to address gas leak emissions.

Third, EEA should take an active role in developing strategies to encourage the eventual removal of unused gas infrastructure and provide specific details on how it intends to achieve this goal in the CECP. As written, the CECP appears to rely on the hope that electrification will reduce methane leaks, stating that “it is possible that a planned, geographic contract of the gas distribution system could further reduce...[methane] emissions”. CECP at 46. Finally, MassDEP can take steps to better understand historic and current levels of methane emissions. MassDEP should perform an analysis to compare the most recent emissions results to previous results (dating back to 1990) to accurately measure progress towards GWSA goals. When new emissions factors were introduced in 2015, the dramatic “reduction” in methane leaks was not accurately presented, including in Figure 9 of the CECP. CECP at 44. Additionally, MassDEP should endeavor to measure and monitor atmospheric methane levels to account for all methane leaks and correctly assess the Commonwealth’s progress towards its goals under the GWSA.



## CLF Recommendations to Strengthen Strategy N2 (Implement Best Practices Around Residual Non-Energy Emissions)

- **Incorporate CLF recommendations to Strengthen Strategy E3 (waste), above;**
- **Fund the Healthy Soils Program;**
- **Direct MDAR to use the program to establish a baseline of data on soil carbon measurement in the Commonwealth; and**
- **Develop a program to incentivize farmers to adopt and maintain farming practices that drive carbon sequestration, improved water quality, and other benefits.**

The CECP proposes that the Commonwealth and its agencies establish best practices to minimize the growth of non-energy emissions from solid waste disposal, wastewater processing, and agricultural activities. CECP at 47.

Improving soil health to drive carbon sequestration is an important and untapped natural climate solution for the Commonwealth. Shifting from conventional farming practices to regenerative agriculture practices can rebuild soil organic matter and store carbon into the soil so it serves as a carbon sink. Scientists estimate that farmers can increase soil carbon stock at a rate of 500 pounds or more per acre per year. As the soil becomes healthier, it can yield a range of co-benefits for farmers and for communities in addition to carbon sequestration, including cleaner water, improved crop productivity, enhanced biodiversity, and reduced need for inputs like pesticides.

Investing in climate-smart farming practices will ensure that farmers are partners in combatting climate change and building a more resilient agricultural sector in the Commonwealth. There is growing enthusiasm in the farming community for adopting these beneficial, soil-building practices, which include minimizing soil disturbance through low- and no-till practices, maximizing soil cover through cover cropping, and keeping living roots in the soil through crop rotations. The Commonwealth should start by funding the Healthy Soils Program,<sup>54</sup> signed into law by Governor Baker in January 2021, which will provide much-needed grants and technical assistance to farmers seeking to improve the health of their soils. The Massachusetts Department of Agricultural Resources (“MDAR”) should use the program to establish a baseline of data on soil carbon measurement in the Commonwealth. From there, the Commonwealth should develop a program to incentivize farmers to adopt and maintain farming practices that drive carbon sequestration, improved water quality, and other benefits. CLF welcomes the opportunity to provide input on policy design.

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<sup>54</sup> See House No. 5250, An act enabling partnerships for growth, lines 1063-1097. Filed Jan. 6, 2021. [https://d279m997dpfwgl.cloudfront.net/wp/2021/01/01-06\\_EcoDev\\_H5250.pdf](https://d279m997dpfwgl.cloudfront.net/wp/2021/01/01-06_EcoDev_H5250.pdf).

## Chapter 6. Protecting our Natural and Working Lands

Massachusetts forests have the capacity to sequester about seven percent of the Commonwealth’s current emissions. Over half of forested land in Massachusetts is privately owned, so efforts to conserve such land must make sound business sense to protect our natural and working lands from competing economic incentives.

### Summary Table of CLF Natural and Working Land Sector Recommendations

<b>GHG Reduction Strategy Proposed by EEA</b>	<b>CLF Recommendation</b>	<b>Need for Legislation / Regulation</b>
<b>Strategy L1: <i>Protect Natural and Working Lands</i></b>	Amend Wetlands Protection Act to include policy of no net-loss of wetlands.	Statutory and regulatory changes are required.
	Enact companion law for protection of forested lands.	Statutory and regulatory changes are required.
	Prioritize impacts of natural and working lands on environmental justice populations and public health impacts.	Regulatory amendments would be helpful.
<b>Strategy L2: <i>Manage for Ecosystem health and Enhanced Carbon Sequestration</i></b>	Use best practices outlined in Healthy Soils Action Plan and Resilient Lands Initiatives as a baseline for improving ecosystem health and not as an idealistic goal.	No legislation or regulations necessary; guidance may be helpful.
	Quantify the effects of new construction and tree and forest removal on urban heat levels and air pollution under MEPA.	Regulatory amendments would be helpful.
<b>Strategy L3: <i>Incentivize Regional Manufacture &amp; Use of Durable Wood Products</i></b>	Ensure that CLT manufacturing is governed by sustainable forest management practices.	Regulatory amendments may be necessary.
	Require CLT manufacturing companies to hire persons from EJ populations and people underrepresented in the workforce.	Regulatory amendments to ensure diverse, fair, and competitive market may be necessary.
<b>Section 6.2</b>	Develop market framework in collaboration with community groups and stakeholders.	Statutory and regulatory changes are required.

GHG Reduction Strategy Proposed by EEA	CLF Recommendation	Need for Legislation / Regulation
<b>Strategy L4: <i>Develop Sequestration Accounting and Market Frameworks</i></b>	Ensure carbon sequestration offset market is diverse, fair, and competitive by lowering barriers to entry for minority owned businesses.	Regulatory amendments to ensure diverse, fair, and competitive market may be necessary.

### CLF Recommendations to Strengthen Strategy L1 (Protect Natural and Working Lands)

- **Amend Wetlands Protection Act to include policy of no net-loss of wetlands;**
- **Enact companion law for protection of forested lands; and**
- **Prioritize impacts of natural and working lands on EJ populations & public health impacts.**

EEA proposes the creation and funding of incentive-based programs designed to achieve no net-loss of forest and farmland. CECP at 49. EEA will also continue to protect and restore inland and coastal wetlands, specifically by developing blue carbon mapping and inventory techniques while monitoring potential increases in methane emissions from degraded wetlands. CECP at 49-50.

Since the late 1970s, the Wetlands Protection Act (M.G.L. c. 131, § 40) has provided a crucial mechanism for conservation of wetland resources and the areas that serve to protect them. In most municipalities in Massachusetts, this law is administered and enforced by the municipal Conservation Commission; many cities and towns also have a local bylaw to provide additional protections beyond those offered by the Wetlands Protection Act. Because most Massachusetts municipalities already have a board with expertise in conservation, EEA need not start from scratch in using natural lands in the fight against climate change. The Wetlands Protection Act should first be updated to include a policy of no net-loss of wetlands (which some municipalities already include in their local bylaws).

A companion law modeled similarly to the Wetlands Protection Act should be enacted to regulate forested lands, institute a policy of no net-loss of forested land, and incentivize re-forestation as much land as possible. These programs should include funding mechanisms for municipal conservation commissions to help alleviate the cost of administering and enforcing additional regulations and finance any necessary education and training. Finally, because of the significant impact that wetlands and natural lands have in mitigating the effects of climate change and the associated public health effects, any and all changes to the Wetlands Protection Act and any additional legislation regarding natural and working lands which arises from the CECP must prioritize funding, development, and protection of these resources in and around communities with EJ populations.

Both the IAC and CJWG have provided recommendations regarding natural and working lands for EEA to incorporate into the CECP, some of which are set forth here, and all of which

need to be incorporated to the best extent possible into the CECP. It is imperative that Strategy L1 include an explicit directive to preserve healthy, mature trees and naturally vegetated areas, especially but not exclusively in the urban environment. Too often, EJ populations are waging campaigns to preserve mature trees that provide public health benefits in the face of development plans to remove such trees in the name of new housing or safer streets. In addition to the Resilient Lands Initiative, we recommend adding a specific action to the CECP that agencies should avoid the removal of healthy, mature trees, and mitigate any loss for transportation, development, or energy infrastructure projects. All projects undertaken by the Commonwealth or receiving state funding or permits should evaluate the impacts of tree removal and the ability to retain existing tree cover and add additional carbon sequestration features.

The Commonwealth needs to establish a bold goal to plant a specific number of urban and suburban trees by a certain date, with a focus on EJ populations, and along rivers, streams, and meadows. We further recommend an action that requires the Commonwealth to identify priority locations to convert concrete and asphalt to green spaces in communities with EJ populations and ensure that trees will both survive and not violate accessibility laws and regulations. This recommendation is interconnected to the work to repair gas leaks and to ensure that new trees are not planted in places that will be killed by gas leaks.<sup>55</sup> Priority locations for tree planting should include public transit bus stops, school bus stops, and school grounds. The action should also include creating a network of shady green spaces in high-density neighborhoods across the Commonwealth using vacant lots, tax title parcels and other areas.

### CLF Recommendations to Strengthen Strategy L2 (Manage for Ecosystem Health and Enhanced Carbon Sequestration)

- **Use best practices outlined in Healthy Soils Action Plan and Resilient Lands Initiatives as a baseline for improving ecosystem health and not as an idealistic goal; and**
- **Quantify the effects of new construction and tree and forest removal on urban heat levels and air pollution under MEPA.**

To ensure improved diversity and ecosystem health on natural and working lands, EEA proposes to implement and incentivize best management practices identified in the Healthy Soils Action Plan and Resilient Lands Initiative. CECP at 50. This presents an appropriate starting point for managing ecosystem health, as each of these programs has been lauded as robust and each has been developed with stakeholder and expert input. EEA should be careful to ensure that climate mitigation and adaptation are explicitly laid out as core principles and goals of each program. Wherever and whenever possible, EEA's efforts in managing ecosystem health and enhanced carbon sequestration should go above and beyond the best management practices

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<sup>55</sup> Claire Schollaert, Robert C. Ackley, Andy DeSantis, Erin Polka, Madeleine K. Scammell, *Natural gas leaks and tree death: A first-look case-control study of urban trees in Chelsea, MA USA*, Environmental Pollution, Volume 263, Part A, 2020, 114464, ISSN 0269-7491, <https://doi.org/10.1016/j.envpol.2020.114464>.

set forth in the Healthy Soils Action Plan and Resilient Lands Initiative, as such practices should be the baseline performance, rather than an idealistic target for achievement.

We recommend adding an action to Strategy L2 that requires developers to quantify the heating and cooling implications of their projects. To ensure that transportation, housing, and commercial development do not exacerbate heat and air quality, developers should be required to quantify the effects of new construction and tree and forest removal on urban heat levels and air pollution when applying for MEPA approval. The impact of gas leaks on tree health should also be considered when deciding whether to install or repair natural gas pipes or to replace them with renewable energy sources. The Commonwealth should ensure that tree planting jobs are marketed towards and accessible to EJ populations and should quantify annual forestry jobs filled by members of EJ populations. EEA should allocate a minimum percent of any funding and resources for technical assistance to protecting resources in EJ populations. A certain amount of treed removal (which should also take into account the size, density, and maturity of trees) should be designated as triggering the need for an EIR under MEPA, and capital projects which call for the removal of healthy, mature trees should be rejected. Further, MEPA review must require that developers quantify the effects of new construction and tree removal on urban heat levels and air pollution and that developers mitigate these effects by means of replacement plantings, which should be monitored for a term of three to five years to ensure success and viability, as well as any other available mitigation methods.

### CLF Recommendations to Strengthen Strategy L3 (Incentivize Regional Manufacture & Use of Durable Wood Products)

- **Ensure that CLT manufacturing is governed by sustainable forest management practices; and**
- **Require CLT manufacturing companies to hire persons from EJ populations and people underrepresented in the workforce.**

If EEA pursues incentives for cross laminated timber (“CLT”) proposed in Strategy L3, it must ensure that it is appropriately balancing the tradeoffs between encouraging a CLT industry and preserving mature trees for maximal carbon sequestration. CECP at 51. Any incentives which the Commonwealth provides to encourage the manufacturing and use of CLT should be accompanied by regulations and/or policy requirements outlining sustainable forestry management practices which ensure that production of CLT results in no net-loss of forested lands, ideally requiring that harvested lumber for CLT production be replanted at a rate higher than the rate at which it is harvested. Manufacturers should be required to hire and train persons from EJ populations and incentives should be developed to ensure capital and funding for minority-owned CLT manufacturing businesses and other people underrepresented in the workforce, such as by women, people of color, veterans, formerly incarcerated people, and people living with disabilities.

## CLF Recommendations to Strengthen Strategy L4 (Develop Sequestration and Market Frameworks)

- **Develop market framework in collaboration with community groups and stakeholders; and**
- **Ensure carbon sequestration offset market is diverse, fair, and competitive by lowering barriers to entry for minority owned businesses.**

Without an accounting and market framework to measure the Commonwealth's goals for 2050, the need to protect natural and working lands cannot be properly undertaken. Several frameworks are available publicly online, so EEA need not start from scratch in developing a framework. In undertaking to complete this goal, however, EEA should take into account the region's susceptibility to the harsh impacts of climate change, the need to preserve unique and local biodiversity and habitat, and the interplay between natural and working lands and matters pertaining to environmental justice. At the very least, an outline or skeleton framework should be included in the final CECP.

A regional carbon sequestration offset market should prioritize ensuring that EJ populations are able to reap any economic benefits arising from such markets, not experience harm from such markets, and should ensure that barriers to entry for any minority owned businesses are lowered such that the market is diverse, fair, and competitive.<sup>56</sup> While reducing emissions must remain a top priority, for those emissions which are difficult or nearly impossible to fully eliminate, use of carbon sinks to offset such emissions will be beneficial. Pursuant to research conducted by the Lancaster Environment Centre, the best approach would be to first reduce emissions as much as possible using one inventory, then to use carbon sinks to counter any recalcitrant emissions in a separate inventory. Any carbon sink which is included in accounting by the Commonwealth should be: real, in that carbon sequestration has actually occurred; verified, in that the sink is recorded and tracked by a reputable entity; permanent, in that the sequestered carbon is not re-released in the future; and additional, in that the carbon being sequestered would not have been but for this measure. Finally, any "netting," or accounting of carbon sequestration as a reduction in emissions, should not be greater than the size of carbon sinks which are real, verified, permanent, and additional, and the Commonwealth should do its best to rely on in-state carbon sequestration options in its accounting.

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<sup>56</sup> Bryndis Woods and Elizabeth Stanton, "Initial Assessment of the Climate Justice Working Group's Recommended Policy Priorities – Tracking Equity and Justice," Applied Economics Clinic (March 2021), pages 11-14, *provided as an attachment to the CJWG comment letter.*

## Conclusion

CLF is pleased to serve on the GWSA Implementation Advisory Committee and has appreciated the opportunity to offer input throughout the development of the CECP. We welcome the opportunity to meet with EEA staff to discuss our recommendations herein. Implementing CLF's recommendations will strengthen the final CECP and assist EEA in complying with S.9, An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy.

*CLF, on behalf of its members, seeks a multi-agency GWSA implementation plan that puts Massachusetts on the path to be a national leader in both addressing the climate crisis and environmental injustice. Founded in 1966, CLF is a nonprofit, member-supported, regional environmental organization working to conserve natural resources, protect public health, and promote thriving communities for all in the New England region. CLF protects New England's environment for the benefit of all people. We use the law, science, and markets to create solutions that preserve our natural resources, build healthy communities, and sustain a vibrant economy. CLF serves to protect and promote the interests of its 5,300 members, including more than 2,900 members residing throughout the Commonwealth.*

## Appendix A: Synapse Energy Economics, “Design of the CECP Policy Approach for Buildings”



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## Memorandum

TO: CONSERVATION LAW FOUNDATION

FROM: ASA HOPKINS, PHD, COURTNEY LANE, JASON FROST, JON TABERNERO, PHILIP EASH-GATES, AND CHERYL ROBERTO, JD

DATE: FEBRUARY 25, 2021

RE: DESIGN OF THE 2030 CECP POLICY APPROACH FOR BUILDINGS

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We have reviewed the Interim Clean Energy and Climate Plan for 2030 (CECP) with particular focus on the strategies for reducing emissions from existing buildings. These include Strategy B2 (“Pivot the Market for Building Envelope Retrofits and Clean Heating Systems”) and Strategy B3 (“Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions”). Together, these strategies are described as being “the most likely, cost-effective, and technologically feasible approaches” to increase thermal electrification (with electric space heating adopted across approximately one million household and 300-400 million square feet of commercial real estate) to reduce emissions by 6.8 million metric tons (MMT) in 2030; increase the performance of building envelopes (with 20 percent of the building stock receiving a deep energy retrofit) to reduce emissions by 1.3 MMT in 2030; and blend low-carbon fuels into fuel oil and pipeline gas to reduce emissions by 2.1 MMT in 2030.<sup>1</sup>

We have concluded that the strategies described in the CECP are not the most robust or cost-effective approach to achieving the 2030 emission reduction requirement. If the state opts to pursue these strategies, it could result in unnecessary additional costs and challenges for residents and businesses in meeting the 2040 and 2050 targets. It would also miss opportunities to center equity in the design of programs. As an alternative, we recommend an increased focus on strategies that result in changes in heating and other building systems (through electrification and efficiency), particularly targeting high-emission buildings and low-income households, with reliance on a cap structure only as a backstop. If a pricing mechanism for building heat is desired, we recommend that it be levied on thermal equipment rather than heating fuels to better align the strategy with the CECP’s stated goals. This memo describes the results of our analysis and is informed by our experience evaluating the performance of different energy policy designs and programs across North America.

### **Targeting electrification and efficiency can reduce emissions more than identified in the CECP**

Not all buildings are the same. The CECP does not explicitly recognize this fact. As a result, it is missing opportunities for additional emission reductions from targeting. We used the Energy Information

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<sup>1</sup> Executive Office of Energy and Environmental Affairs. 2020. *Interim Clean Energy and Climate Plan for 2030*. Page 29.

Administration's (EIA) *2015 Residential Energy Consumption Survey*<sup>2</sup> (RECS), the *2012 EIA Commercial Building Energy Consumption Survey*<sup>3</sup> (CBECS), and the data provided by building owners in compliance with Boston's Building Energy Reporting Disclosure Ordinance<sup>4</sup> (BERDO) to estimate the distribution of on-site building emissions resulting from fossil fuel combustion. Using this proxy, we determined that if Massachusetts were to meet the electrification targets described in the CECP (1 million homes and about one quarter of commercial real estate) by targeting the highest-emitting homes and the highest-emission-intensity commercial real estate, it could reduce emissions by as much as 13 MMT by 2030, well in excess of the required reductions for the building sector. This shows that targeted efficiency and electrification should be the centerpiece of the CECP's building strategy.

There has been no state-specific energy or emissions survey of Massachusetts buildings. However, we scaled the New England region results presented in EIA's RECS and CBECS surveys to match the distribution of fuel uses in Massachusetts. RECS presents New England results from Climate Zone 5A (which covers MA, CT, RI, and southern NH), and we worked from this subset. For CBECS, we scaled up recent natural-gas heated buildings in order to represent the growth in this sector in the state during the 9 years since the survey was last completed in 2012. The scaled CBECS results align well with the overall distribution from Boston's BERDO data, which provides a critical piece of recent supporting data.

Figures 1 and 2 present the results of this analysis. Each figure shows the cumulative CO<sub>2</sub> emissions from fuel combustion as a function of the cumulative fraction of the stock (housing units or commercial square feet) when the stock is put in the order of increasing emissions intensity. The slopes of the lines show the intensity of the units at that point in the distribution.

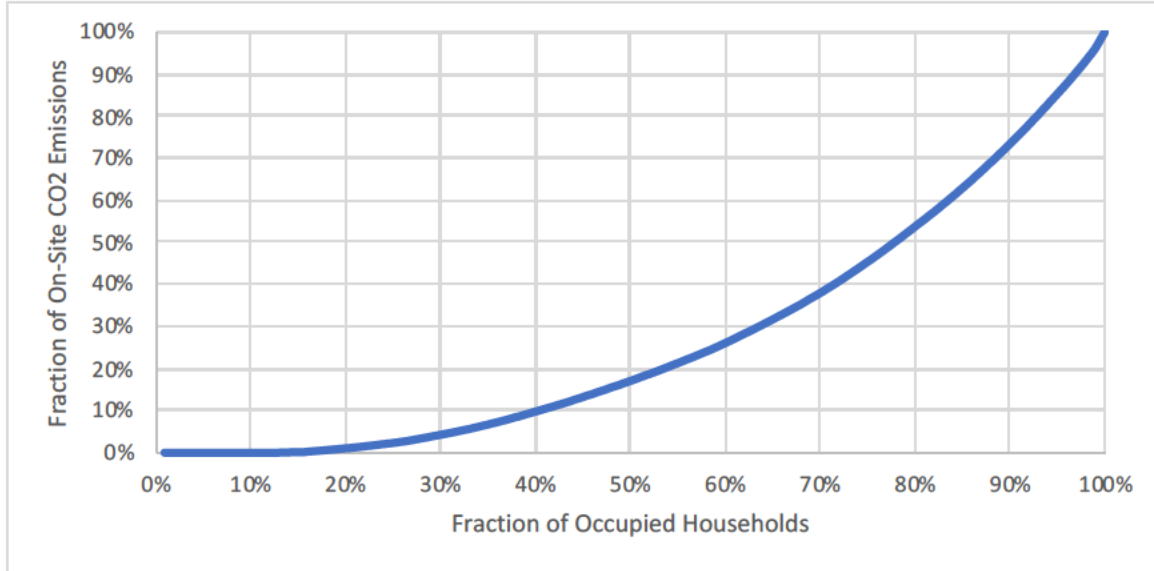
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<sup>2</sup> U.S. EIA. *2015 RECS Survey Data*. Available at <https://www.eia.gov/consumption/residential/data/2015/>.

<sup>3</sup> U.S. EIA. *2012 CBECS Survey Data*. Available at <https://www.eia.gov/consumption/commercial/data/2012/index.php?view=microdata>.

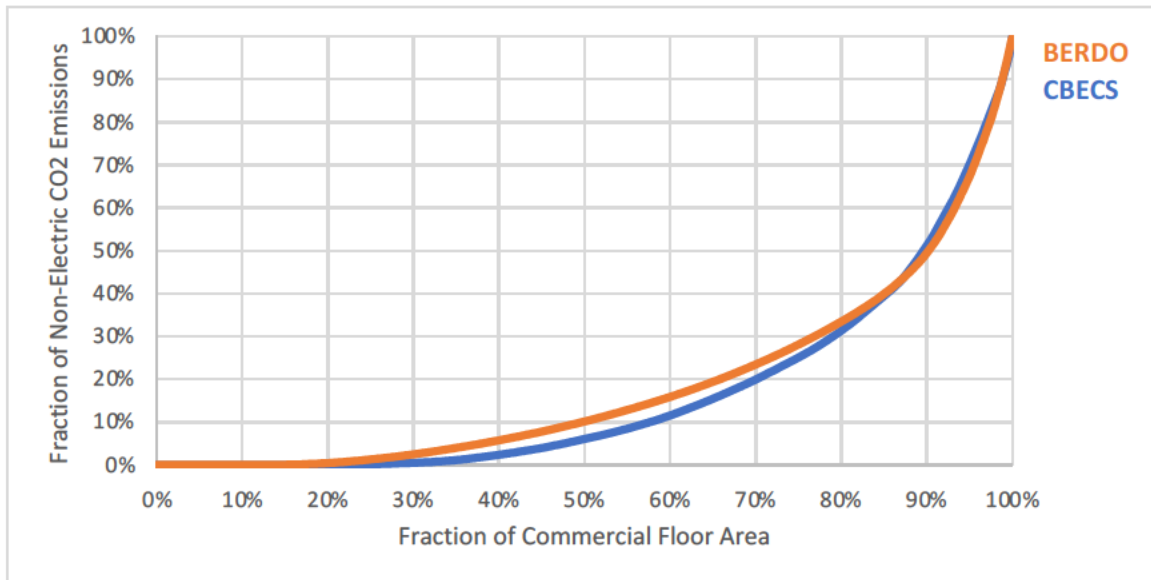
<sup>4</sup> City of Boston. *Building Energy Reporting and Disclosure Ordinance (BERDO)*. Data available at <https://data.boston.gov/dataset/building-energy-reporting-and-disclosure-ordinance>.

**Figure 1. Estimated cumulative distribution of Massachusetts on-site residential CO<sub>2</sub> emissions versus cumulative occupied households**



Source: Synapse analysis of data from EIA RECS

**Figure 2. Estimated cumulative distribution of Massachusetts on-site commercial CO<sub>2</sub> emissions versus cumulative square footage**



Source: Synapse analysis of data from EIA CBECS and Boston BERDO

From these figures we can see that it is very likely that a small fraction of Massachusetts buildings is responsible for a large fraction of on-site CO<sub>2</sub> emissions. In particular, **just 22 percent of homes (about 650,000 units) emit half of the residential fuel-combustion emissions, and the million highest-emitting homes (just over one third of the total) produce 68 percent of emissions. In the commercial sector, the**

***CBECS and BERDO data tell a similar story: one quarter of the floor space produces between two thirds and three quarters of emissions.***

The million highest-emitting homes are not a random subsample. They include more than 85 percent of all of the state’s fuel oil heated homes (which together consume more than 95 percent of residential heating oil). They include 21 percent of fossil-gas-heated homes, and burn 41 percent of residential gas. Over 95 percent of the million are single family homes, and about 90 percent are owner-occupied. About 62 percent of the million highest-emitting homes are occupied by households with incomes under \$100,000 (\$2015) per year, but they represent just 27 percent of such households. The 38 percent of high-emitting homes with higher income occupants house about 67 percent of such families.

These data have a number of implications for the CECP:

- Targeting high-emission buildings raises equity issues, especially in the residential sector. Larger homes with higher-income occupants are over-represented in the high-emitting group. However, many poorly performing buildings with low- and moderate-income occupants would also be in the targeted group. Even relatively smaller energy bills can be a large burden for lower-income families. Assisting lower-income households to switch to efficient electric heating and improved building shells is essential in order to limit exposure of this group to higher gas rates that could accompany transition of wealthier households off the gas system. Careful program design is required to achieve equitable outcomes that are consistent with the path to net zero in 2050. Reliance on market forces alone (including a heating fuel emission cap) would exacerbate inequity.
- Blending biofuels into heating oil or pipeline gas is not necessary to meet the 2030 emissions target. In fact, targeted electrification toward high-emitting homes would nearly eliminate heating oil use, so there would be very little remaining fuel to blend into (and very few emissions left to reduce with that blending).
- One drawback of focusing on the million highest-emitting homes (and their counterparts in the commercial sector) is that not all of these buildings are due to replace their heating systems between now and 2030 because of the 20-year expected lifetimes for most heating systems. However, sufficient emission reductions would be available from a combination of targeted high-emission buildings with other buildings to achieve the 9.4 MMT per year emission reduction requirement without the need to use fuel blending. A large portion of the high-emitting buildings will be ready for substantial electrification and/or weatherization before 2030. This is because:
  - most high-emission buildings will be due for *either* heating or air conditioning system replacement before 2030 (because heat pumps can be used to replace both of these systems, and heating and cooling equipment replacement cycles are not necessarily aligned);

- ductless heat pump systems can be added to radiator-heated homes outside of the heating system replacement cycle;
  - water heaters have shorter lifetimes, and a large majority will be replaced before 2030; and
  - building shell improvements can be applied even before heating system replacements, to reduce emissions prior to heating system replacement for buildings that have recently replaced both heating and cooling systems.
- Pairing building shell improvements with electrification is essential, in order to reduce the size and cost of the new heating and cooling systems, mitigate winter peak effects on the electric grid, and reduce overall energy bills (including for fossil gas customers who otherwise might have seen increased energy bills from electrification because of the current low retail price of fossil gas relative to electricity). As mentioned above, even buildings which are not due for new heating systems before 2030 could be good candidates for building shell improvements during this period. By definition, these building occupants pay more for heat than others, making them prime candidates to save money by improving their building shells.
  - Geographic clustering may provide opportunities for district heating solutions, including shared heat pump reservoirs. Large commercial buildings and campuses, and neighborhoods with older or larger homes, provide an opportunity to retire gas network assets and allow gas rate base and operations and maintenance costs to fall so that gas rate pressures are mitigated. Just 107 buildings produce half of Boston’s non-electricity CO<sub>2</sub> emissions, so targeted technical assistance and customer approaches for large emitters could be highly effective.
  - The state should acquire better data than the current publicly available data used for this initial analysis. The gas utilities and fuel dealers have data regarding the consumption of their customers. These data, supplemented by a building survey, could cost-effectively generate a “Massachusetts Building Emissions and Energy Consumption Survey.” These data could be used to generate more accurate versions of the analysis presented here and could be used to target emission-reduction programs to where they will be most effective at reducing emissions. These data could support a statewide building energy disclosure database (akin to Boston’s BERDO) and would also be essential inputs to statewide building emission performance standards (as discussed on page 33 of the CECP).

### **Building sector emissions cap will not create needed level of electrification**

As part of Strategy B3, the CECP proposes the development of a long-term, declining emissions cap on heating fuel (gas, oil, propane) emissions consistent with meeting or exceeding Global Warming Solutions Act of 2008 (GWSA) required emissions reduction levels. The CECP does not propose a recommended framework for this cap. Instead, it directs the Department of Environmental Protection to develop and implement the cap by 2023 after consultation with the Commission and Task Force on Clean Heat.

While the CECP does not prescribe a mechanism for the emissions cap, the safest assumption based on other fuel emissions cap programs would be that compliance with the cap will be borne in the first instance by upstream heating fuel suppliers (i.e., oil, propane, and gas distributors). While an upstream cap can simplify tracking and compliance with emissions reduction targets, it is problematic for several reasons.

The primary issue with this mechanism is that it creates a disconnect between the sale of fuel and the equipment consuming that fuel, while the CECP's metrics and stated end goals rely on equipment and infrastructure changes driving toward electrification of virtually all current fossil fuel end uses. The entities needing to comply with a cap (natural gas, propane, and oil suppliers) are not the same entities making equipment choices that will lead to compliance (users of equipment that consume these fuels). If an oil supplier must either sell less fuel to its customers or sell less carbon-intensive fuel to comply with the cap, it is going to choose the option that does not cannibalize its business. The oil dealer is going to focus its efforts on procuring biofuels instead of encouraging its customers to switch from oil to an electric heat pump. This may lead to an increase in biofuel blending but will not encourage electrification.

Additionally, an emissions cap on its own will not incentivize natural gas utilities to change their business model or promote electrification. Utilities will continue to put an emphasis on preserving their business while achieving the cap requirements. This means a continued focus on renewable natural gas (RNG) and hydrogen, despite their high cost.<sup>5</sup> This will allow utilities to continue to expand and invest in the delivery system, increase their rate base, and earn a return on those assets. The Pipeline Gas case examined in the 2050 Roadmap shows that this approach leads to a doubling of gas rates and a net cost to the state of more than one billion dollars relative to the All Options pathway based around electrification.<sup>6</sup> If the Commonwealth wants to drive the more cost-effective transition to thermal electrification for the majority of buildings, a cap must be developed alongside changes to utility business models, and act as a secondary policy behind those which directly promote electrification.

While the CECP lists utility business models as an issue for consideration by the Commission and Task Force, this should be foregrounded as part of the development of the cap itself. For example, the cost of any excess emissions allowances and/or penalties for noncompliance should be placed on shareholders, rather than ratepayers, to better align interests. This appropriately reflects where the costs would fall in a competitive market. If one heating fuel supplier meets the cap and another fails to, the competitive market won't allow the second one to charge a higher price to customers to make up the cost of the compliance fee. In addition, the Commission and Task Force should consider alternative regulatory constructs for natural gas utilities that can enable their participation in electrifying the market. This

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<sup>5</sup> Table 11 on page 75 of the EEA's *Energy Pathways to Deep Decarbonization* report estimates that net-zero carbon gas will cost triple what fossil gas costs in 2050, on a per-unit basis.

<sup>6</sup> Executive Office of Energy and Environmental Affairs. 2020. *Energy Pathways to Deep Decarbonization*. Pages 72 and 75.

could include the ability to form a thermal district heating utility or to earn a financial incentive for fuel switching from natural gas to electric heat pumps.

Further, while not explicitly stated in the CECP, a common goal of an emissions cap is to increase the price of the more polluting fuel compared to cleaner options, assuming that consumers will respond to the price differential and choose the cleaner option. However, we know from over thirty years of energy efficiency programs that energy prices alone will not drive consumer behavior. There are well known market barriers in place that lead to irrational consumer response to energy prices. Some of these barriers include lack of information, lack of upfront capital, and split incentives between landlords and tenants. These barriers are particularly present for disadvantaged and frontline communities, members of which will have the hardest time mitigating the effects of a price-based approach.

Electrification has its own unique set of barriers including lack of customer and contractor awareness, inaccurate operation and sizing of systems, lack of controls, and customer uncertainty around comfort and performance. These barriers contribute to the slow update in customer adoption of heat pumps even though it is already cost-effective for customers heating with oil and propane to switch to a cold-climate air-source heat pump. This is similar to consumer behavior in the transportation sector. While there are differences in barriers to electrification of buildings compared to transportation, including access to charging infrastructure, studies have found that rebates and tax incentives have a much larger effect than fuel prices in driving consumer choice for electric vehicles. For example, a recent survey of recipients of California’s EV incentive found that 73 percent of survey respondents indicated that the state rebate was very important or extremely important in their decision to purchase an EV.<sup>7</sup> For these reasons, it will be critical that education, incentives, and market transformation activities take place in coordination with any emissions cap.

Table 4 of the CECP includes the heating fuel emission cap as an action that will help achieve thermal electrification, building envelope improvements, and new construction goals. However, for the reasons summarized above we do not find this cap alone will contribute substantially to those desired outcomes. In addition to changing business models and addressing market barriers to electrification we recommend the following if a cap is created:

- If possible, the emissions cap should be imposed on the purchase of space and water heating systems and based on their lifetime emissions. This structure would better align the policy goal of the cap with the point of customer decision-making.
- A fuel-based emissions cap should be used only as a “backstop” in case other actions are falling short, rather than as a primary policy to drive the desired action of electrification. This reflects the real-world experience with the Regional Greenhouse Gas Initiative (RGGI), where emission reductions have been driven by RPS policies and state procurements as much or more than by

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<sup>7</sup> Hardman, S. et al. 2017. “The effectiveness of financial purchase incentives for battery electric vehicles – A review of the evidence”. *Renewable and Sustainable Energy Reviews*, Volume 80, December 2017, Pages 1100-1111.

the cap itself, and with California’s comprehensive suite of climate policies, where regulatory approaches are responsible for most emission reductions and the cap-and-trade system is used as a backstop.<sup>8</sup>

### **Promoting decarbonized fuel blending may delay needed investment in electrification**

The CECP identifies decarbonized fuel blending as a means to achieve a 2.1 MMTCO<sub>2</sub>e reduction. The Plan specifically indicates fuel oil blended could achieve an approximate 20 percent reduction in carbon intensity by 2030 and pipeline natural gas could reduce carbon intensity by 5 percent. The CECP appears to assume that the GHG benefits of fuel blending occur first, before the effects of efficiency or electrification.<sup>9</sup> This is contrary to the order of priority that is essential for long-term success to achieve net zero. Promoting low-carbon fuel in the near term will make it more difficult to cost-effectively reach the 2040 and 2050 emissions targets.

Consumers typically only replace water heaters every 10-25 years and space heating equipment every 20 years.<sup>10</sup> Therefore, if a customer installs a combustion heating system between 2021 and 2030, based on the assumption of blended fuel availability throughout its life, it will still be in use throughout the 2040s. This creates an outcome in which a more carbon-intensive fuel source is used over the long term, compared to a scenario in which these systems were instead replaced by high-efficiency cold climate heat pumps or heat pump hot water heaters prior to 2030.

Converting a customer from fossil fuel to electric heating near the end of the equipment’s useful life is far more cost-effective in comparison with converting that customer when their equipment is relatively new. Early retirement of excess fossil fuel systems installed between 2021 and 2030 will increase the overall cost of decarbonization.

Delaying electrification increases the risk that a significant number of these fossil fuel systems will need to be replaced before the end of their useful life for Massachusetts to achieve its decarbonization goals. We used Synapse’s Building Decarbonization Calculator to evaluate the impact of delayed electrification. We compared the proposed CECP adoption rate (one million heat pump systems by 2030) with a lower rate of home electrification (achieving about 500,000 heat pump heating systems by 2030) to illustrate the long-term impacts. While the lower-electrification case can be part of a net zero portfolio in 2050 (as

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<sup>8</sup> Energy Systems Catapult. 2018. *Interaction of Climate Policies in California: Rethinking Decarbonisation Incentives – Policy Case Studies*. Available at: <https://es.catapult.org.uk/wp-content/uploads/2018/10/California-Climate-Policies-Case-Study-FINAL.pdf>

<sup>9</sup> Petroleum use in Massachusetts buildings was responsible for 6.95 MMT of CO<sub>2</sub> emissions in 2017 (according to the state’s Annual GHG Emission Inventory 1990-2017 available at <https://www.mass.gov/doc/appendix-c-massachusetts-annual-greenhouse-gas-emissions-inventory-1990-2017-with-partial-2018/download>), so a 20 percent reduction would be 1.4 MMT (assuming biodiesel were fully GHG neutral). Five percent of natural gas emissions would add 0.63 MMT (if the blended gas were GHG neutral). Together these add to slightly under 2.1 MMT. The CECP provides no assurance that the blended fuels would actually be GHG-neutral.

<sup>10</sup> Electric Power Research Institute (EPRI). 2018. *U.S. National Electrification Assessment*. Available at: <https://www.epri.com/#/pages/product/3002013582/>





evidenced by the analysis presented in the 2050 Roadmap, where even the Pipeline Gas scenario can be made to meet the target, albeit at a high cost<sup>11</sup>), its building sector emissions are noticeably higher than they would be under the CECP trajectory. The state would then need to compensate for these emissions with reductions elsewhere, or bear the additional cost of early replacement of heating systems to align the lower-electrification case with the CECP case.

Figure 3 shows the annual sales share for residential heat pump heating systems in the CECP and low-electrification cases, and the resulting stock share. The slower pace of market transformation before 2030 in the low-electrification case has long-term implications for deployed stock and the associated emissions.

**Figure 3. Annual sales share (left) and stock share (right) for heat pumps in residential space heating applications in the CECP and low-electrification cases**

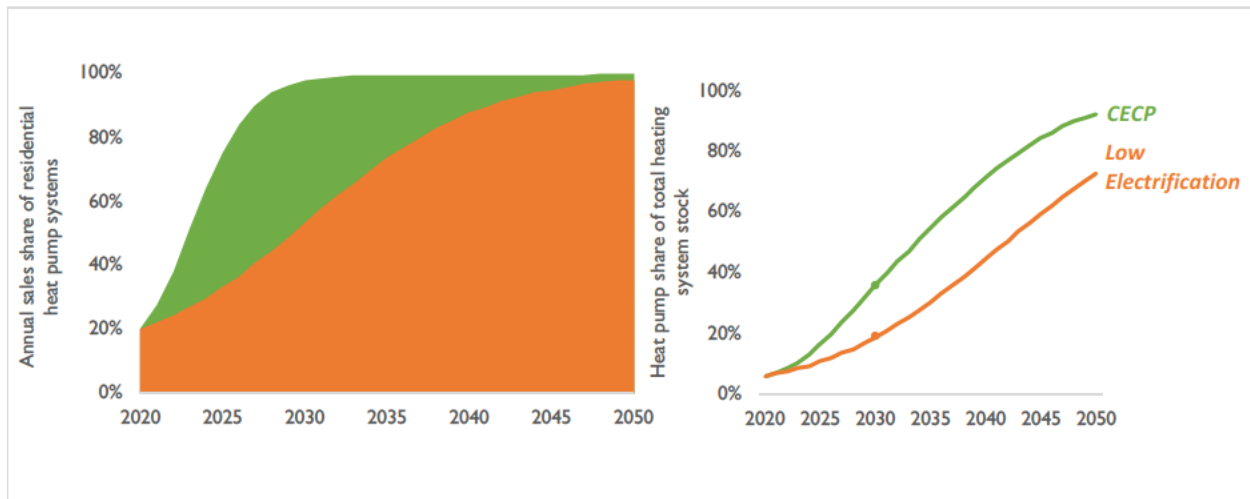
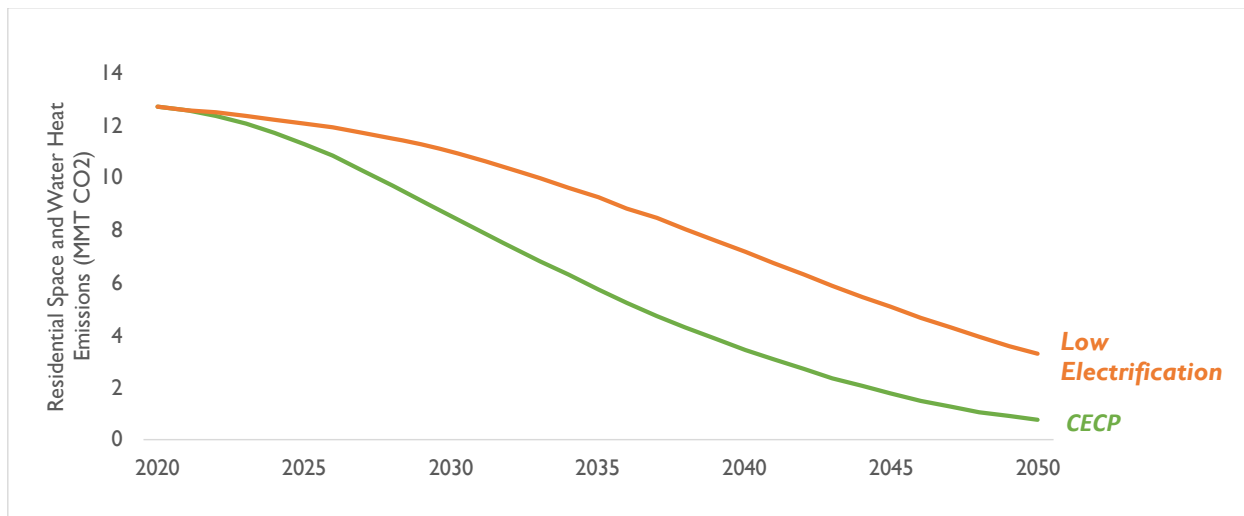


Figure 4 shows the remaining emissions from on-site residential space and water heating in the CECP and low-electrification cases. Note that the low-electrification case emissions in 2050 are 2.5 MMT higher than the CECP case. In order to reduce 2050 residential building sector emissions in the low-electrification case to the level of the CECP case, about 600,000 households would need to replace their combustion heating systems before the end of their typical useful life.

<sup>11</sup> Massachusetts Executive Office of Energy and Environmental Affairs. 2020. *Energy Pathways to Deep Decarbonization: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study*. Pages 39-40. Available at: <https://www.mass.gov/doc/energy-pathways-for-deep-decarbonization-report/download>

**Figure 4. Emissions from on-site combustion in residential space and water heating applications in the CECP and low-electrification cases**



In addition to the unnecessary costs imposed on customers, the continued existence of these legacy hot water and heating systems will slow the overall market transformation needed to meet the Commonwealth’s electrification goals. This slower progress will itself increase costs and risks to consumers:

- **Natural Gas:** Promoting fuel blending will lead to continued investment in the natural gas system, along with higher fuel prices. As natural gas use declines as projected, the fixed costs needed to maintain and operate the gas system will end up being spread out over fewer units of gas sales, which in turn will increase costs for customers that remain on the gas system. This means customers that invest in new space heating equipment for fossil fuel or blended fuel before 2030 will likely be faced with both increased gas distribution rates to cover the utility’s revenue requirements and increased gas supply rates.
- **Oil and Propane:** Fuel blending would require the ramping up to 100 percent biofuel (B100) over time and continuing at those levels, while at the same time heat pumps are becoming technologically superior and more cost-effective for customers. This is not a likely scenario because customers would act in their own interest over time and shift away from blended heating oil. There are currently no fuel blending options for propane so it is not realistic to assume there will be continued delivery within the emissions cap.

### **Recommendations for concurrent programs to support electrification**

As part of Strategy B1 and B2, the CECP proposes several changes to the Mass Save program. While we find these to be a step in the right direction, we recommend further changes to help accelerate electrification.

### ***Rebates for fossil-fuel measures***

The CECP recommends that Mass Save incentives for fossil fuel equipment in new construction be eliminated in 2022, but seeks to phase-out incentives for fossil-fuel retrofit measures from 2022-2024. There is no need to slowly phase-out these incentives and wait to eliminate them in 2025.

Further, without firm heat pump targets as part of those plans, removing these incentives alone will not necessarily encourage program administrator support of gas-to-electric fuel switching. The natural gas utilities and joint electric and natural gas utilities will continue to have an internal bias related to existing business models to maintain natural gas sales. This bias will lead to achieving three-year energy efficiency goals from other measures that do not cannibalize the gas business.

We therefore recommend that all incentives for fossil fuel measures be discontinued in 2022 and those funds be directed towards driving electrification. If needed, the Mass Save targets could be amended to account for the elimination of these measures.

### ***Biofuels and RNG***

Strategy B2 states that DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters. To the extent that “clean heating” solutions include biofuels and RNG, we do not find this appropriate for low-income customers.

The programmatic focus for low-income customers should be electrification, as they will be least able to escape a stranded cost-created utility death spiral and the high cost of low-carbon fuels, or bear the sunk costs of early replacement of heating equipment. Instead of promoting biofuels and RNG, incentives should be provided to electrify these homes and provide a rate-subsidy to offset near-term increases in electricity costs (if necessary).

### ***Advanced controls and fossil equipment removal***

The Mass Save programs should continue to incentivize advanced controls as heat pumps are installed in combustion-heated homes. These controls are essential to achieve maximum emission reductions from heat pump installations that use a backup combustion heating source. For customers that previously installed a heat pump for cooling only or to supplement an existing fuel source, we recommend that a program offering be developed that incentivizes removal of the existing fuel source.

### ***Creation of Mass Save heat pump target***

As indicated above, removing incentives for fossil-fuel measures will not be sufficient to drive electrification. We therefore recommend that a separate heat pump target, eligible for a performance incentive, be developed for the next Three-Year Mass Save Plan.

As part of this target, the program administrators would be required to ensure that each heat pump system is sized to meet the full heat load of the household and is paired with advanced controls. This could be based on gas utilities’ monthly consumption data (vs. temperature) to determine the required size for each home before energy efficiency.

## The role of energy suppliers

The CECP does not address the Alternative Energy Portfolio Standard (APS) as a potential policy mechanism to increase adoption of clean heat technologies or fuels. The current blend of Mass Save, MassCEC, and APS programs for supporting heat pumps creates customer confusion and lowers policy effectiveness, and not all of these programs support weatherization. Additionality for emission reductions from these programs is difficult to ascertain, because heat pump installations participate in more than one program if the building owner or installer can navigate all of the program requirements. Adding a heating fuel emission cap to the APS and Mass Save programs could increase confusion and undermine effectiveness unless there is additional program coordination and simplification.

One argument for retaining a role for the APS is to put some of the cost of supporting heat pumps and other clean heat options on the energy portion of electric bills, rather than only on the delivery portion. However, this is a minor benefit. Pipeline gas and delivered fuel suppliers are not subject to an APS obligation, so if the APS structure were to be used more aggressively to pursue the goals of the CECP the obligation should be expanded. This would mean that already-electrified buildings would not pay more than their fair share of the cost of this policy.

The APS shows some of the pitfalls of a market-based approach to building decarbonization. As a policy-created market, the market is subject to instability which reduces its efficacy at driving consumer behavior. As in a renewable portfolio standard, the price of Alternative Energy Credits tends to be near the cap price, or near zero, depending on whether the market is short or long in credits. Participating building owners do not know when they make a building system investment whether the market price will be high or low at the time they come to sell their credits. As a result, the effectiveness of the policy to drive building owner behavior is weakened.

If the CECP strategies include assignment of some costs to energy suppliers through an APS-like mechanism, we suggest that the distribution utilities (in the form of the Mass Save program) act as an intermediary between customers and the credit market. This offers price stability in the same way that the state's SMART solar and storage program offers a stable price for solar renewable energy credits (SRECs). Revenue from selling compliance credits to energy suppliers would reduce the revenue that Mass Save administrators would need to collect from distribution rates. This intermediary role should be limited to capital investments with upfront credits, such as heat pumps (and could be expanded to weatherization). Operating approaches such as the use of biofuel blending have no need for this intermediary role because the value of credits would average out over time.

## Conclusion

The 2030 CECP has been developed at a critical time in the state's pursuit of net zero by 2050. Typical buildings in Massachusetts will undergo heating system replacements only once between 2030 and 2050—and many will have only one replacement between now and 2050. The policies established in the 2030 CECP must, therefore, be particularly effective and targeted to create the required transformation of building envelopes and heating systems and get the state on pace to cost-effectively meet the net zero requirement. As the CECP rightly identifies, this means efficient electrified space and water heating.



By targeting programs at the heating systems of high-emission buildings and homes of low-income residents (and especially high-emission buildings with low-income occupants), the state can reduce emissions more quickly than envisioned in the Interim CECP without relying on costly stopgap measures such as biofuel blending.





**Sheri Givens**  
Vice President  
US Regulatory & Customer Strategy

March 22, 2021

**Via E-Mail**

Kathleen A. Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
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Boston, MA 02114  
[gwsa@mass.gov](mailto:gwsa@mass.gov)

Re: Massachusetts Interim Clean Energy and Climate Plan for 2030 – Public Comments of Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid

Dear Secretary Theoharides:

Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid (“National Grid” or the Company”) are pleased to submit the below comments on the Interim Clean Energy and Climate Plan for 2030. As detailed in its Net Zero by 2050 Plan, National Grid is committed to exploring a wide range of solutions to deliver affordable, reliable clean energy to its customers no later than 2050. National Grid believes that many of the ten key areas of focus identified in its Net Zero by 2050 Plan are well aligned with the Commonwealth’s “strategy actions” identified in the Interim Clean Energy and Climate Plan for 2030 (“Plan”). National Grid looks forward to continued engagement with the Baker-Polito Administration including the Executive Office of Energy and Environmental Affairs (“EEA”) to improve upon and implement the strategy actions identified in the Plan across the various economic sectors in which the Company is involved.

What follows is National Grid’s specific feedback on certain strategy actions identified in the Plan, consistent with EEA’s request for public comment. National Grid appreciates the opportunity to provide this feedback and looks forward to the release of the final Clean Energy and Climate Plan for 2030.

Sincerely,

Sheri Givens  
Vice President  
US Regulatory & Customer Strategy

**INTERIM CLEAN ENERGY AND CLIMATE PLAN FOR 2030  
COMMENTS OF NATIONAL GRID**

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# INTERIM CLEAN ENERGY AND CLIMATE PLAN FOR 2030

## COMMENTS OF NATIONAL GRID

### Executive Summary

National Grid appreciates the opportunity to submit comments on the Interim Clean Energy and Climate Plan for 2030. National Grid shares the Commonwealth's commitment to deep decarbonization and is committed to partnering with the Commonwealth and our customers to advance decarbonization and the Commonwealth's ambitious 2030 target in ways that maintain the affordability, resilience, and reliability of our energy system. To be successful, achieving the levels of decarbonization envisioned in the Plan will require broad engagement from all stakeholders, including consumers and the private sector. In the comments that follow, National Grid, based on its experience and ongoing efforts in each of the economic sectors, offers specific recommendations for how the strategy actions identified could be modified to advance the Commonwealth's emissions reduction goals in the most cost-effective way possible for consumers. We look forward to engaging with the Commonwealth and stakeholders on the proposed strategies.

In October of 2020, National Grid released its *Net Zero by 2050 Plan* aimed at achieving net zero by 2050, including emissions reductions from the sale of electricity and gas to our customers. This plan outlines our approach to exploring a wide range of solutions to advance the clean energy goals that we share with the Commonwealth. Our plan identifies the following key areas of focus:

1. Reducing demand through energy efficiency and demand response;
2. Decarbonizing the gas network through use of renewable natural gas and hydrogen;



3. Reducing methane emissions from our own gas network while working with the industry to reduce emissions through the entire value chain;
4. Integrating innovative technologies to decarbonize heat;
5. Interconnecting large scale renewables with a 21st century grid;
6. Enabling and optimizing distributed generation;
7. Utilizing storage;
8. Eliminating sulfur hexafluoride (“SF6”) emissions;
9. Advancing clean transportation; and,
10. Investing in large scale carbon management.

The comments below highlight National Grid’s efforts in many of these focus areas. As we work to enable a net zero future, we also continue to make important investments in safety, reliability, and storm response, while providing greater assistance to income-eligible customers.

Achieving a net zero future will involve targeting the highest emitting fuels and sectors first, optimizing the utilization of existing networks, and ensuring affordability with the strategic use of electricity and natural gas. It will require accelerating the pace of clean energy and emission-reducing investments, sustained technological innovation, and policy design that meets these objectives as cost-effectively as possible. Significant challenges and opportunities will undoubtedly emerge as we work to decarbonize transportation, achieve a very low-carbon electricity sector, introduce new low- and no-carbon fuel technologies such as renewable natural gas and hydrogen, and transition to next-generation heating systems. Across sectors, multiple potential pathways to net zero exist, and enabling the most efficient approach will require investment along multiple technology development fronts and policies that do not preclude potentially cost-effective solutions. Key objectives for policy should include reducing barriers to

innovation or adoption, encouraging efficient investment of capital, incentivizing the most cost-effective emissions reductions, avoiding policy duplication and keeping customer affordability and choice at the forefront.

National Grid supports the Commonwealth's objectives and many of the strategies presented in the draft Plan and has provided comments to enhance or refine other strategies where there potentially are missed opportunities or adverse customer impacts. We look forward to supporting the Commonwealth as it further develops these recommendations and remain committed to doing our part to help the Commonwealth advance decarbonization across the economy while ensuring affordability, resilience and reliability.

## **I. TRANSPORTATION SECTOR**

As the Plan notes, the transportation sector represents 42% of the Commonwealth's greenhouse gas ("GHG") emissions. Achieving the Commonwealth's decarbonization goals will require a fundamental transformation of the transportation sector, with electrification at the forefront. Success will require robust charging availability at reasonable costs, consumer willingness to adopt electric vehicles, and sufficient vehicle offerings to enable this choice. Near term challenges for the Commonwealth include expanding access to electric charging infrastructure, educating and engaging customers, and reducing up-front vehicle and electric vehicle supply equipment ("EVSE") costs to customers. As we look to accelerate this transition, new and innovative solutions and partnerships will be necessary. The public, non-profit, and private sectors will need to engage and collaborate in new ways as well. National Grid, through its existing programs in Massachusetts, has made meaningful progress in addressing these challenges and continues to work on enabling transportation electrification in ways that make sense for our customers and the distribution system. National Grid looks forward to leveraging its

experience and lessons learned in serving as a partner to EEA and other key stakeholders as the Commonwealth advances the strategies outlined in the Plan.

We offer specific comments on individual strategies below.

### **Strategy T1: Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions**

National Grid supports the Transportation and Climate Initiative Program (“TCI-P”) as a foundational initiative to promote transportation sector decarbonization in the region and applauds Governor Baker’s leadership and the Legislature’s efforts in advancing TCI-P in the region. TCI-P will encourage cost-effective emission reductions in the transportation sector by establishing a price on transportation-related carbon emissions, while providing Massachusetts with proceeds that can fund publicly beneficial investments to support transformation of the transportation sector. The Company agrees with the high-level priorities for investment of TCI-P proceeds outlined in the Plan, and supports the commitment established in the TCI-P Memorandum of Understanding to allocate a minimum of 35% of TCI-P proceeds to ensure that overburdened and underserved communities benefit equitably from clean transportation projects and programs.

The Company is committed to enabling electric transportation in its service territory through programs that provide cost-effective infrastructure investments and innovative customer offerings. National Grid’s current programs in the Commonwealth include incentive offerings for our customers to install make-ready infrastructure and electric vehicle (“EV”) chargers, incentive offerings for residential customers to charge during off-peak hours, and advisory services to support fleets in their pathways to electrification. These programs are critical to meeting the needs of National Grid’s customers, providing necessary support and the infrastructure backbone to support electrification of transportation. Directing TCI-P proceeds toward activities that

complement existing utility programs will enable the Commonwealth to maximize the impact of TCI-P.

In particular, the proceeds raised under TCI-P will provide a significant source of funding to accelerate EV adoption. TCI-P funding should provide sustained support of rebates for the purchase of light-duty vehicles, fleets, transit, school buses, and other medium- and heavy-duty vehicles. TCI-P funding should also support the purchase of charging equipment to enable the infrastructure needed to facilitate EV adoption. In addition to these incentives, National Grid supports the use of TCI-P proceeds to support active transportation, micro-mobility, transit system expansion and electrification, and other land use/smart growth programs that will help the Commonwealth reach its goals.

With respect to development of a Low Carbon Fuel Standard (“LCFS”), the Company looks forward to further engaging with EEA to consider design options and potential market implications. Key areas of interest for the Company include opportunities to spur development of markets for RNG and hydrogen, treatment of electric fuel, and interactions with TCI-P.

### **Strategy T2: Implement Coordinated Advanced Clean Vehicle Emissions and Sales Standards**

National Grid supports the Commonwealth’s commitment to adopt and implement: the California Advanced Clean Cars II Standard by the end of the year in which the standard is finalized by California; the ZEV purchase mandates of the California Advanced Clean Trucks rule by December 31, 2021; and the Advanced Clean Fleets rule by the end of the year in which the rule is finalized by California.

The Company also supports the ambitious and achievable goals of the Medium-and Heavy-duty ZEV MOU and recognizes the importance of the enabling framework and Action Plan. National Grid recommends that the framework development process include utilities, which

provide critical support for make-ready and charging infrastructure and advisory services for fleet-owning customers. National Grid has been assisting customers across its jurisdictions to enable fleet electrification and understands the level of support needed to successfully transition fleets to electric vehicles. National Grid looks forward to collaborating with the Massachusetts Department of Environmental Protection (“MassDEP”) as the Action Plan is developed to provide lessons learned from the Company’s existing fleet advisory programs, as well as insight into the infrastructure upgrades and investments that will be required throughout this transition.

### **Strategy T3: Reduce Upfront ZEV Purchase Cost Burden**

National Grid agrees that reducing the up-front costs of EVs remains an essential action to encourage EV adoption and supports the actions identified in the Plan to address this issue. Allowance proceeds raised under TCI-P can provide a robust and sustainable source of funding for these initiatives. Providing rebates at point of sale can increase the attractiveness of rebates by reducing the immediate upfront cost burden for customers. The Company recommends that any low and moderate income (LMI)-focused offerings also be implemented at point of sale. The Company also recommends that point of sale rebates be expanded to include pre-owned vehicles, which will help to facilitate LMI access.

The Company supports the proposal of Department of Energy Resources (“DOER”) to develop a heavy-duty ZEV incentive program in 2021. As incentives are necessary for light- and medium-duty vehicles, they are equally important for heavy-duty vehicles. And, while the proportional incremental cost of replacing a traditional gas or diesel heavy-duty vehicle is often far more than a light-duty vehicle, the GHG and air pollution reductions are significant and necessary in reaching the Commonwealth’s GHG reduction targets. As fleets are offered incentives for heavy-duty vehicles, National Grid recommends close collaboration with its existing

and future programs to provide comprehensive support with fleet advisory services and infrastructure incentives.

#### **Strategy T4: Deploy Electric Vehicle Supply Equipment & Enable Smart Charging**

National Grid looks forward to collaboration with EEA and DOER to develop programs focused on residential charging. The Company is actively evaluating how to most effectively meet the EV charging needs of its residential customers. Given the convenience to EV owners of being able to charge at home, programs should seek to enable all customers, whether they reside in a single-family home or large apartment building, access to charging at their place of residence. Utility programs can provide support for deploying at-home level 2 charging equipment, as well as programs to assist customers in maximizing off-peak charging.

With respect to direct current fast charging (“DCFC”), the Company recognizes that, at current expected utilization levels, applicable electric rate structures may make private investment in DCFC stations unattractive. The Company’s rates are structured to be reflective of the cost to serve customers in a given class. To that end, existing rate structures are not punitive towards EV charging. However, given the importance of DCFC deployment to enable widespread EV adoption, the Company has been actively considering opportunities to provide programs or rate pilots that limit impacts on customers utilizing DCFC in the short term, before utilization levels become sufficiently high. The Company looks forward to submitting such a proposal to the Department of Public Utilities (“DPU”) pursuant to the recent Transportation Bond bill, *An Act Authorizing and Accelerating Transportation Investment*, Chapter 383 of the Acts of 2020.

Time varying rates and advanced demand response have an important role to play in ensuring that EVs are integrated in a way that limits peak impacts and enhances system efficiency. Time varying rates can provide a consistent signal to customers to avoid charging at peak times,

and active demand response programs can help avoid the potential system costs imposed by the highest peak load days. Managed charging provides even greater opportunity to enhance load management and improve system efficiency, and the Company is exploring how to expand our residential offerings to include these capabilities. Development of fair and effective rates for EV charging now will play an important role in enabling wide-scale EV deployment over the next decade.

#### **Strategy T5: Engage Consumers & Facilitate Markets**

National Grid is supportive of the efforts identified in the Plan to engage consumers and facilitate markets. The Company supports and encourages the Commonwealth to expand consumer awareness, outreach, and education efforts, which are critical to accelerating EV adoption. With respect to efforts around medium- and heavy-duty vehicles and fleets, the Company supports the Massachusetts Clean Energy Center (“MassCEC”) in developing pilot programs to further expand resources and best practices. As the Plan recognizes, the Company currently has programs to support fleets, though limited to public fleets at this time. Going forward, it will be prudent to align any state programs with utility programs to leverage the resources offered and lessons learned and ensure that efforts are complementary and not duplicative. Ongoing partnership between state entities, utilities, and other market participants will maximize the benefits of electrification programs and accelerate adoption.

#### **Strategy T6: Stabilize Light-Duty VMT & Promote Alternative Transportation Modes**

National Grid supports the proposed actions to reduce vehicle miles travelled (“VMT”) and promote Smart Growth, as part of a holistic strategy to reduce transportation GHG emissions.

## II. BUILDING SECTOR

A range of comments on specific Building Sector strategy actions are below, but as a general matter, National Grid recommends that the Commonwealth expand its consideration of how to leverage existing natural gas infrastructure to achieve its climate goals. Achieving the Commonwealth's GHG emission reduction goals for the Building Sector will require substantial electrification of heating to displace the use of delivered fuels for heating. Nonetheless, independent studies from the Northeast region<sup>1</sup> have recognized that reliability and affordability concerns can arise if Building Sector decarbonization strategies focus too heavily on heat electrification and do not take advantage of new low- and no-carbon fuel technologies (i.e., renewable natural gas and hydrogen) as well as hybrid approaches that pair electrification of heating with traditional natural gas or low- or no-carbon fuel for meeting heating needs on the coldest days. Affordability concerns will more acutely impact low- and moderate-income residents, who already require incremental effort and cost to reach through energy efficiency incentives. Existing gas infrastructure can deliver low- or no-carbon renewable fuels to customers, further reducing emissions with lower dependence on consumers making major capital outlays for their homes and businesses. Moreover, continued investment in this infrastructure is required by legislative directives to address public safety concerns and advance environmental goals through the replacement of aging or leak prone infrastructure.<sup>2</sup> To encourage the continued development of low carbon fuels and hybrid heating system deployment, the Plan should recommend further support for these technologies and systems to advance these outcomes.

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<sup>1</sup> See e.g., E3 and EFI, [Net-Zero New England: Ensuring Electric Reliability in a Low-Carbon Future](#), November 2020; The Brattle Group, [Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050](#), (Dec. 2020), available at <http://www.energy.ri.gov/documents/HST/RI%20HST%20Final%20Pathways%20Report%205-27-20.pdf>.

<sup>2</sup> M.G.L. c. 164, § 145(b).



## **Strategy B1: Avoid Lock-In of Building Systems That Are Not 2050-Compliant**

### Development of a high performance stretch code.

National Grid is generally supportive of the use of codes and standards as a low-cost pathway to driving improved building performance and reduced emissions from the building sector. That said, EEA should consider two important caveats as it finalizes the Plan around stretch codes.

First, a high performance stretch code should not be used as means of allowing or enacting municipal bans on new gas connections in the interest of driving adoption of electric heat pumps in lieu of gas heating. While electric heat pumps will play a critical role in decarbonizing the Building Sector, the substitution of low- and no-carbon fuels for traditional natural gas can decarbonize gas networks and building energy use that relies on them, and gas networks can play a key role in providing peak demand energy for hybrid gas-electric heating systems. Foreclosing customer options to utilize gas systems despite the important role that those systems can play in decarbonizing the Building Sector will increase both operating costs for customers as well as increase building costs for developers and owners of new housing construction. This is particularly challenging at a time when the Commonwealth is facing significant housing affordability challenges and will exacerbate existing economic inequities within the Commonwealth. As such, instead of bans on gas connections, the Commonwealth's Building Sector policies should retain as a core tenet the ability of customers to choose the heating options that best meet their needs and that are aligned in the long run with the Commonwealth's decarbonization goals.

In this regard, the Plan should take account of emissions reductions achieved and expected through the Gas System Enhancement Plan ("GSEP") authorized by M.G.L. c. 164, § 145. Over the period of 2010 through 2019, National Grid has replaced over 1,222 miles of leak-prone pipe through the GSEP, providing significant reductions of methane emissions. National Grid estimates

that the first five years of the GSEP resulted in reduction of 11,580 metric tons of CO<sub>2e</sub>. and that its continued leak-prone pipe replacement activities through the GSEP over the next five years (2021 through 2025) will result in the additional reduction of over 18,000 metric tons of CO<sub>2e</sub>. National Grid also now is eliminating Grade 3 leaks with Significant Environmental Impact as part of the GSEP program. Ongoing investment in the replacement of aging and leak prone natural gas infrastructure is required by law and is a key component of National Grid's obligation to provide safe and reliable service to its customers at a reasonable cost. Continued support of the GSEP program and decarbonizing the fuels used in this infrastructure will advance the Commonwealth's climate goals without compromising customer choice or public safety.

Second, it will be essential that any stretch code enactment ensures an ongoing role for the energy efficiency Program Administrators in providing builders and homeowners with access to the technical expertise, vendor networks, and incentives that are the hallmarks of the Commonwealth's current nation-leading energy efficiency programs. Absent access to these tools, the cost to developers (which will ultimately be reflected in higher housing prices) of complying with stretch code requirements would likely increase dramatically.

Elimination of incentives for fossil fuel equipment in new construction situations.

National Grid does not support a blanket ban on providing incentives to customers in support of the pursuit of any class or category of cost-effective energy efficiency. The Green Communities Act obligates all energy efficiency Program Administrators to pursue all cost-effective energy efficiency savings for customers. To the extent that rising baselines (i.e. increasing efficiency of 'standard' fossil fuel based heating equipment) are reducing opportunities for the Program Administrators to cost-effectively and cost-efficiently (i.e. balancing benefits against overall customer costs) realize incremental savings through the promotion of higher

efficiency fossil fuel-based heating equipment, decisions around incentives for this equipment should be driven through the existing energy efficiency programs' data-driven planning and stakeholder engagement processes, not mandated through administrative sanction.

Additionally, the premature elimination of any incentives would not have the desired effect of reducing near-term GHG emissions. The removal of incentives for high efficiency, cost-effective fossil-fuel based heating systems will not drive most customers to the early adoption of electric heating measures as intended – rather, it will push customers towards the purchase and installation of lower efficiency equipment utilizing their preferred fuel choice. This will have the impact of *increasing* emissions in the near-term.

In light of the anticipated substantial role for heat electrification under any decarbonization pathway, given the assumed 20-year life of a typical heating system, a customer decision to install a high efficiency fossil-fuel based heating system over the next ten years does not lock that customer into continuing to use that system in 2050 and beyond. Rather, customers installing a new efficient heating system in the upcoming decade will likely have another opportunity to revisit their heating system fuel choice, at a time when the costs of electric heat pump options have likely decreased, and the range of options has increased. Encouraging customers to install a high efficiency fossil-fuel heating system in the near term will still deliver important GHG reductions, particularly as we work to decarbonize the gas distribution system. Additionally, gas-fueled technologies like thermal heat pumps and hybrid gas/electric systems can play important roles in achieving net zero by 2050.

The EEA should examine the potential for market-based solutions to advance low-carbon fuels in sectors that are difficult to electrify such as heating. For example, the Rhode Island Heating Sector Transformation report recommends establishing policies, such as a “Clean Heating

Fuel Standard,” to advance gradual decarbonization of all heating fuels by 2050.<sup>3</sup> This follows an approach adopted by policymakers in other states that have advanced procurement standards for renewable heating fuels consistent with the approach taken to electric RPS programs or low-carbon fuel standards for transportation; incorporating even modest amounts of fuels such as RNG and hydrogen can lead to emission reductions. For example, if Massachusetts natural gas sellers were to replace just 5% of the natural gas used by 2030 beginning in 2025, there would be more than 1.7 million metric tons of CO<sub>2</sub>-equivalent reductions by 2030, roughly the same as the annual emissions of 370,000 light-duty vehicles. If the amount is increased gradually to 10% by 2040, the programs could reduce more than 3.4 million metric tons of GHGs, equivalent to 740,000 light-duty vehicles. We encourage the Administration to look at a wide range of policy options that can be reviewed by stakeholders and policymakers to find the right combination of programs to serve customers and achieve the Commonwealth’s environmental goals.

Moreover, because low- and no-carbon fuels can decarbonize gas networks over time, for many customers long-term usage of gas-fueled heating will be the best option for achieving GHG emissions reductions. Such customers should have incentives to adopt highly efficient gas-fueled heating systems. As they become cost effective, new technologies such as thermal heat pumps and hybrid gas/electric heating systems should be eligible for incentives since they can play an important role in Building Sector decarbonization. The Commonwealth should explore policies to accelerate the cost effectiveness of these technologies so that they may be deployed sooner.

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<sup>3</sup> See The Brattle Group, Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050, at 63 (Dec. 2020), available at <http://www.energy.ri.gov/documents/HST/RI%20HST%20Final%20Pathways%20Report%205-27-20.pdf>

EEA will support establishing state appliance standards by statute.

National Grid remains strongly supportive of the establishment of statewide appliance standards as a low-cost pathway to ensuring that the benefits of energy efficiency reach all residents of the Commonwealth. Specifically, the Company hopes that appliance standards language included in Senate Bill No. 9, *An Act creating a next-generation roadmap for Massachusetts climate policy*, remain a component of any final bill that is ultimately enacted into law.

### **Strategy B2: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems**

DOER will work to phase out incentives for fossil fuel heating systems as soon as possible, limiting fossil fuel heating system incentives in the 2022-2024 Three Year Plan, and ending all fossil fuel heating system incentives by the end of 2024.

For the same reasons that National Grid does not support the nearer-term elimination of cost-effective incentives for high-efficiency fossil fuel-based heating system measures in the new construction sector, National Grid does not support the broader elimination of similar incentives in the broader market.

Collectively, in 2019 (the most recent year for which data is available), the energy efficiency Program Administrators supported customer adoption of over 7,000 high efficiency fossil-fuel based heating systems, generating an estimated 79,000-ton reduction in lifetime CO<sub>2</sub> emissions as a result of these system purchases and installations. As in the new construction sector, the elimination of these incentives and the Program Administrators' complementary customer engagement and education efforts are unlikely to have the desired impact – preventing customers from accessing these programs will not lead most customers to convert to electric heating systems – rather, these customers will be more likely to purchase and install lower efficiency heating

systems utilizing their current fuel choice, leading to **increased** near term emissions from these buildings.

This change would also have a profound impact on the Program Administrators' efforts on behalf of income-eligible customers. The elimination of incentives for high efficiency fossil-fuel based equipment would force the Commonwealth's most vulnerable customers to switch to electric space and water heating options in order to access and benefit from the Program Administrators' "no cost to the customer" income-eligible heating system replacement programs. Perversely, even with the receipt of a no-cost system, this will increase space and water heating costs for many of these customers, as operating and fuel costs in the Commonwealth for even the highest efficiency electric-based heating options far outstrip the operating and fuel cost of pipeline natural gas-based heating systems. Additionally, many of these customers may lack the space and ventilation requirements necessary for the use of an air-source heat pump based hot water system, effectively locking them out of receiving energy efficiency program support for hot water heating system upgrades.

DOER will work to increase electrification through Mass Save® programs through air source and ground source heat pump incentives and consumer education in 2022-2024.

National Grid is supportive of near-term increases in the electrification of the building heating sector in the Commonwealth, particularly in situations where those conversions can cost-effectively displace a current customer's reliance on delivered fuels (e.g. home heating oil and propane) or electric resistance heat. For example, in the Company's current (2019-2021) three-year energy efficiency plan, the Company committed to supporting the installation of 3,553 new air source heat pumps displacing a customer's oil or propane system at a budgeted aggregate incentive cost of \$17.3 million.

The scale and pace of the increases suggested through the proposed Plan, however, require careful consideration on two dimensions: (1) development of a reliable and sustainable air source heat pump market in the Commonwealth; and (2) required costs.

According to preliminary data, the statewide energy efficiency programs installed over 3,500 heat pumps either partially or fully displacing oil or propane heating systems in 2020. To achieve the goals set forth in the Plan, the Program Administrators would have to grow annual installations by over 28 times the current program efforts. A more reasonable target growth rate could allow for continued significant progress towards the Commonwealth's goals, while allowing for the market developments (customer education, installation contractor training and workforce development investments, distribution network development) necessary to support sustained market transformation. Attempts to prematurely force these volumes before the necessary market developments have occurred are likely to degrade the customer experience of the very early adopting customers that the Commonwealth will need to be advocates for the technology in order to drive sustainable, long-term market growth. Conversely, the potential for negative experiences by these "early adopters" could represent a significant setback to medium-term adoption aspirations.

In 2019, National Grid paid an average incentive of \$4,000 per home to market rate customers installing heat pumps for the purpose of full displacement of an existing heating system. Simply multiplying this number against 100,000 homes per year suggests necessary incentive costs of \$400 million per year to support that volume of conversions. In reality, achieving the level of growth and market penetration required to get to 100,000 homes per year would require increases in incentives. Additionally, higher incentives would be required for income eligible, and, potentially, moderate income customer segments in order to make these conversions economically

feasible. Further grossing up these incentive costs to account for necessary programmatic expenses - customer outreach and engagement, system inspections and rebate processing, workforce development efforts, etc. and total programmatic costs could be expected to exceed \$600-700 million per year, or \$6-7 billion in total over 10 years. These costs also ignore the required customer contribution (i.e. the portion of the installed system cost not covered by incentives) to funding the conversion or replacement of an existing heating system; at an assumed average incremental customer contribution of \$6,000 per conversion, this would add another \$600 million per year in total investment required to achieve 100,000 conversions per year.

Placing 100% of these costs on electric customers (the sole current source of funding for the incentives necessary to make air source heat pumps economic for displacement of delivered fuels for heating purposes today) is not a tenable option. In fact, such an outcome would likely be counter-productive, as it would increase the costs of the very electricity needed to power these heating systems, thus requiring even greater incentives to drive the customer economics necessary to support the customer interest and adoption required to achieve the Commonwealth's decarbonization goals. Alternatively, the CECP should actively pursue and plan for alternative funding sources to support required incentives, including, but not limited to, funding from state and federal general revenues.



DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in environmental justice (EJ) communities through targeted community-based incentives and outreach programs, and increased funding for pre-weatherization barriers.

National Grid remains deeply committed to ensuring that the benefits of energy efficiency reach all of its customers. In the Company's current three-year energy efficiency plan, 15.4% of planned budgets are dedicated to the Company's income-eligible programs. This commitment, as always, needs to be balanced against costs, which are borne by all customers (including both income-eligible as well as market rate customers). For a variety of reasons, supporting customer adoption of energy efficiency in these segments is significantly more expensive than driving similar savings from market rate customer segments. For instance, during the Company's 2016-2018 Three Year Energy Efficiency Plan term, the Company's total spending on income-eligible programs was 15.7% of the Company's total spending on market rate residential programs. For this level of spend, income-eligible programs delivered 7.2% of the total lifetime energy savings realized through the Company's energy efficiency programs. The Company's income-eligible programs are a foundational element of its broader energy efficiency programs in the Commonwealth, and the Company is steadfast in its commitment to ensuring equitable access to our programs for all customers. The costs of substantial expansions of any program offering, though, must be understood and weighed against resulting energy burdens on all customers (including many of the customers targeted in the CECP's identified strategy above).

Additionally, it must be recognized that at current retail electric and natural gas prices, even air source heat pumps provided at no cost to income-eligible customers are likely to increase the energy burdens of customers currently relying on natural gas for heating. The Commonwealth's decarbonization pathway must account for the unique challenges facing our most vulnerable residents, and strategies must be developed and deployed to ensure these

customers do not bear a disproportionate burden associated with this transition. The Company does not believe that wholesale near-term electrification of these customers' heating needs, absent a substantial re-thinking of how this could be achieved, meets this standard.

Serving renters, particularly through interventions (including weatherization and heating system upgrades) that require capital investments in buildings, also remains a particularly vexing challenge in energy efficiency programs across the country. Generally referred to as the 'split incentive' problem, the fact that decisions and funding for building upgrades are required of parties (building owners) that are distinct from the beneficiaries (the building occupants / renters) of the resulting energy savings remain a significant barrier to driving adoption of capital-intensive (including weatherization and heating system upgrades) energy efficiency measures in this customer segment. This is not to suggest that non-owner-occupied buildings cannot or should not be an important component of the Commonwealth's building decarbonization strategy – just that such participation will require differentiated approaches (and likely higher costs) than approaches that can be expected to deliver similar outcomes from owner-occupied homes and buildings.

EEA and DOER will seek near-term means to enhance MassCEC funding to support continued market development for building decarbonization.

National Grid is supportive of identifying and accessing all potential means of funding to support the substantial and necessary market development efforts that will be required to support the Commonwealth's building decarbonization efforts.

MassCEC will refine and enhance workforce development programs related to building decarbonization and will investigate the need for air-source heat pump certification and workforce training.

National Grid recognizes the substantial workforce development efforts that will be necessary to build and sustain the workforce necessary to deliver on the Commonwealth's building decarbonization aspirations. The Company welcomes any partnerships or forms of public sector support that can accelerate these efforts and underscores that close coordination will be required between any external partners developing and offering supporting workforce development efforts and the energy efficiency Program Administrators that are developing and delivering the programs through which these aspirations will be realized.

**Strategy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions**

The Baker-Polito Administration will convene a Commission and Task Force on Clean Heat by May 2021.

National Grid would welcome the development of a Commission and Task Force on Clean Heat and would urge the Baker-Polito Administration to ensure that electric and gas distribution utilities serving Massachusetts customers are represented on the Task Force, both from the perspective of their role in meeting customers' energy needs as distribution utilities as well as in their role as energy efficiency Program Administrators. As noted in the Plan, the Commission and Task Force should leverage the findings of the DPU's investigation of the role of Massachusetts gas local distribution companies in achieving the Commonwealth's 2050 climate goals currently pending in D.P.U. 20-80.

MassDEP will develop and implement by 2023 a long-term declining emissions cap on heating fuels following consultation in 2021 with the Commission and Task Force on Clean Heat regarding the cap structure and levels consistent with meeting or exceeding GWSA required emissions reduction levels.

Ideally, a cap on heating sector emissions would be part of an economy wide approach to capping carbon emissions using market-based mechanisms (e.g., cap-and-invest) to cost-effectively achieve carbon emissions reductions across the economy. Such an economy-wide emissions cap approach is likely to meet the Commonwealth's overall emission reduction targets more cost effectively than emissions caps on heating fuels alone. The proceeds generated under a market-based approach should be invested in activities that will lower the cost of decarbonization for customers.

Under a market-based emissions cap, a portion of revenue from the heating sector should be directed to support the provision of incentives to customers to enable the transition to high efficiency electric heating options and mitigate bill impacts that would otherwise occur to electric customers as a result of paying those incentives. Specific attention should be given to low-income customers and energy-intensive trade-exposed industrial customers. Second, revenue should be invested in the following activities that will support additional advancement of heating sector decarbonization, including: (1) incentives for renewable natural gas production and interconnection; (2) incentives for hydrogen production and blending projects; and (3) incentives for heat electrification (both air source and ground source heat pumps) for delivered-fuels customers through existing, successful energy efficiency program administration channels and efforts.

### **III. ENERGY SUPPLY SECTOR**

As is recognized in the Plan, significant progress has been made in the decarbonization of the electricity sector, as the Commonwealth's GHG emissions from this sector were reduced by 52% between 1990 and 2017. The electricity sector, with its emissions of 13.6 MMTCO<sub>2</sub>e in 2017, represented 19% of the of the Commonwealths' total GHG emissions. While its share of total emissions is significantly lower than those contributed from the transportation and buildings sectors, the electricity sector emissions must still be reduced by another 30-40% by 2030 for the Commonwealth's Plan to be achieved. Achievement of this Plan will require the deployment of significant capacities of new clean energy resources, the continuing contributions from existing clean resources, and significant investments in the transmission and distribution systems required to ensure delivery. However, a successful achievement also requires a critical focus on ensuring investments are made in the most efficient and cost-effective manner possible for customers. We offer specific comments and suggestions below for successfully achieving the Plan for the energy supply sector. National Grid believes the fundamental requirements for success include: (1) the ability to procure the clean energy required through competitive, regional wholesale markets allowing all clean resources, regardless of technology or age/vintage, to compete based on their costs; and (2) greater use of regional and interregional coordinated transmission planning to allow for more reliable and cost-effective interconnections of these clean resources. National Grid looks forward to working with the Commonwealth to successfully achieve its GHG emissions reduction goals.

#### **Strategy E1: Fill Current Standards & Execute Procurements**

National Grid supports EEA's strategies to continue to ensure all existing procurements for renewable energy and transmission are completed on time and to ensure compliance with existing

portfolio standards and emissions regulations. These actions are critical steps in meeting the Commonwealth's 2030 electric sector decarbonization targets and putting Massachusetts' electric sector on a viable path to net zero by 2050 – a goal supported by National Grid.

Meeting existing targets will require additional considerations in other areas of the electric sector, including a buildout of distribution and transmission networks, infrastructure and resource siting and permitting and balancing customer costs. In-region large-scale transmission and transmission networks to interconnect offshore wind and high-voltage direct current interconnections to neighboring regions such as Hydro Quebec will be key to meeting existing and future procurement targets. EEA should consider additional strategic actions to streamline the development of transmission solutions that support cost-effective achievement of existing policy targets, such as leveraging the ISO-New England (“ISO-NE”) Public Policy Transmission Upgrades Process.<sup>4</sup>

Additionally, the ability to site and permit large-scale renewable projects and the utility infrastructure needed to safely and reliability interconnect such projects to the distribution and transmission systems has proven to be more challenging in New England than in other regions. EEA should consider additional strategic actions to address siting and permitting challenges for new renewable energy resources and distribution and transmission projects that could become barriers to meeting existing and longer-term renewable procurement and decarbonization targets if left unaddressed. Such strategic actions could include, but not be limited to, streamlining and/or consolidating permits issued by the Commonwealth for renewable energy projects and associated interconnection infrastructure which could be issued on an expedited timeline and based on use of best management practices (as discussed further in response to Strategy E4 and E5, below).

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<sup>4</sup> See ISO-New England, Public Policy Transmission Upgrades available at <https://www.iso-ne.com/system-planning/system-plans-studies/public-policy-transmission-upgrades/>

Lastly, but most importantly, EEA must balance customer bill impacts and overall cost against the pace and scale of decarbonization as the Commonwealth transitions its energy supply sector. The accelerated development of competitive, regional wholesale market-based procurement processes for clean energy will be instrumental to meeting decarbonization targets while keeping costs down for customers. The DOER’s May 2019 Offshore Wind Study concluded that an additional procurement for 1,600 megawatts (“MW”) of offshore wind under the existing long-term contracting model is likely to provide cost-effective benefits to customers and contribute to achieving Global Warming Solutions Act (“GWSA”) targets, but noted that the cost-effectiveness of this approach is highly dependent on the regional renewable energy credit (“REC”) market.<sup>5</sup> However, the Offshore Wind Study also cautioned that there are risks associated with having a significant portion (approximately 60%) of electricity demand under long-term contracts. Absent adequate cost recovery and remuneration for entering into a significant magnitude of long-term contracts, the cumulative impacts of these obligations could negatively impact the financial strength of the distribution companies to the detriment of the companies, shareholders and customers.<sup>6</sup> Moreover, the Offshore Wind Study noted that having a high amount of energy tied up in long-term contracts may impact wholesale markets and shift risk to customers as energy markets change.<sup>7</sup> Sufficient consideration and time must be allowed for the development of competitive markets, as well as for the benefits of rapidly developing advances in technologies and supply chains to be fully realized for the Commonwealth.

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<sup>5</sup> Department of Energy Resources Offshore Wind Study at 5-7 (2019), *available at* <https://www.mass.gov/doc/offshore-wind-study/download>.

<sup>6</sup> Id. at 12.

<sup>7</sup> Id.

## **Strategy E2: Develop and Coordinate Regional Planning and Markets**

The Company agrees with this strategy and is proactively working with other stakeholders to advance the design of additional markets and reforms for the existing ISO-NE administered wholesale markets to allow the clean energy goals of the Commonwealth and other New England states to not only be accommodated by ISO-NE's competitive wholesale markets, but also cost-effectively achieved through them. To achieve their clean energy goals, Massachusetts and other states are currently relying primarily on (1) individual solicitations which offer long-term contracts to facilitate the financing of specified new clean resources, and (2) the short-term markets in which the entities serving the load in the state purchase clean energy attributes from existing resources at prices driven more by administratively set requirements and alternative compliance payments ("ACP") than the cost for such resources to produce the clean energy. A new Forward Clean Energy Market (or an Integrated Clean Capacity Market) based on a regional forward auction allowing all clean energy resources, new and existing, to compete on an equal basis to meet the total demand of participating states would allow for the Commonwealth's clean energy goals to be achieved more efficiently and cost-effectively.

Along with this development, additional transmission needs for delivering increased clean energy generation will need to be planned over a longer time frame, and in a more forward-looking manner than at present. This may involve changes to both regional planning processes and regional transmission tariffs to advance transmission solutions in a way that does not constrain the connection of large-scale renewables at the scale needed to meet the Commonwealth's 2030 and 2050 clean energy goals.

With offshore wind resources anticipated to be a primary source of the clean energy required by the Commonwealth and other Northeastern states to achieve a decarbonized energy system, it is critical that the associated transmission delivery facilities be well planned and



coordinated. Project-dedicated radial interconnections, resulting from the project-by-project planning utilized to date, are not likely to be the best transmission solutions for delivering to shore the vast quantity of offshore wind energy anticipated. A more networked, coordinated, and expandable transmission delivery system could provide many benefits, including greater reliability, reduced environmental disturbance, and lower costs to customers.

In order to understand and achieve such benefits, additional interstate and interregional technical studies may be needed, including studies of offshore factors like potential siting and rights of way to minimize environmental and fisheries impacts and cable runs, optimize landfall locations, etc., as well as onshore factors like interconnection points and potential impacts on the existing transmission system, including potential needed transmission system upgrades. Cost studies providing a preliminary assessment of the feasibility/cost effectiveness of various proposed configurations (e.g., radial vs. looped, etc.) might also be needed. Such a systematic and comprehensive approach to transmission planning for the offshore wind will help secure maximum benefits for customers and the environment in the long run.

### **Strategy E3: Align Attribute Markets with GWSA Compliance**

National Grid is concerned that the Plan might suggest a more important and useful continuing role for the existing Clean Energy Standard (“CES”) and Renewable Portfolio Standard (“RPS”) type requirements than should be afforded. While such requirements may continue to be necessary for establishing and monitoring the amount of clean energy entitlements required for the Commonwealth’s GWSA compliance, they should not be utilized, for example, to “tune” the short-term markets for clean attributes if the goal is to efficiently and cost-effectively procure the clean energy and associated investments required in the long run. Retail electricity suppliers must often rely primarily on these short-term markets to procure the clean and/or renewable energy

certificates they require to satisfy annually increasing yearly RPS type requirements. However, such short-term markets are neither effective nor efficient in driving new investments in renewable resources, especially new large-scale renewables (“LSRs”). Moreover, they should not be expected to achieve significantly more clean energy production from existing renewable resources which, with low to zero fuel costs, are already sufficiently incentivized to produce their clean energy whenever able. Rather than resulting in prices truly reflective of any additional cost of producing clean energy, the legislatively/administratively set requirements and the administratively set ACP prices, in the absence of a forward market and longer-term commitments necessary for new resources to compete, produce a market with a vertical demand curve that results in pricing that simply heads to the ACP price when the market is slightly short of supply and quickly heads towards a price of zero (or the transactional cost) when there is surplus. Moreover, any change to those legislatively/administratively set requirements and/or administratively set ACPs in any state can quickly change the REC prices for the entire region. As a result, simply maintaining or expanding the RPS type requirements without a true market in place to allow all new and existing clean energy resources the ability to compete based on their costs will not result in the cost-effective procurement of the clean energy required from new and existing resources required by the Commonwealth and the region. The Company recommends that a single clean energy goal be used to allow all technologies, new and existing, to compete and be counted towards the Commonwealth’s clean energy goals. By creating fragmented requirements, the separate CES and RPS programs put the Commonwealth in the position of picking winners and losers instead of allowing the market to determine the most cost-effective solutions.

If the Commonwealth does not adopt a single unified clean energy requirement that allows for all technologies to compete, and instead continues under the current tiered and technology-

specific approach, it will result in unintended consequences. Most concerning, it would likely result in environmental attributes purchased under existing long-term contracts not being counted towards the Commonwealth's clean energy goals. This, in turn, would unnecessarily increase costs for customers.

Even in its current form, the CES does not allow for all of the clean energy generation to be counted towards compliance because the bulk of the CES requirements need to be met through RPS Class I RECs. Specifically, clean energy certificates ("CECs") from Section 83D of the Green Communities Act, St. 2008 c. 169, cannot be used for the RPS Class I requirement of the CES; instead, Section 83D CECs can only be used to comply with the CES requirements above the RPS Class I requirements. As a result, there will be many years when the Section 83D generation/CECs far exceed the percentages above the RPS Class I requirements, and therefore many of the CECs will not count towards CES compliance despite having been purchased through the 83D procurement process. In 2025, for example, under the current CES framework, 20% of the environmental attributes expected to be purchased under the Section 83D long-term contracts will be needed to meet the CES requirement in that year. This will result in 80% of the remaining environmental attributes purchased under Section 83D being retired without recognition towards any renewable requirement or the CES. Unlike other environmental attributes, excess CECs cannot be monetized through sales to third parties.

National Grid encourages EEA and DOER to combine the fragmented clean energy standards to provide a comprehensive view of Massachusetts' progress in combatting climate change. Regardless of the ultimate methodology selected, it is critical to ensure that all environmental attributes that will be received from existing contracts can be used toward the clean energy standards. Aggregating and simplifying all the Commonwealth's clean energy policies

also will provide the public and the Legislature with more information, enhanced transparency, and allow for improved decisions and resource planning. Cost-effective decisions cannot be made with an incomplete assessment of Massachusetts' status in meeting its clean energy goals.

#### **Strategy E4: Continue to Deploy Solar in Massachusetts**

National Grid supports the stated strategy of ensuring on pace solar development after 2025 in the context of an interconnection process that is evolving to accommodate the increasing saturation of distributed energy resources and the land use constraints around the siting of large ground mounted solar facilities. The DOER's 3,200 MW solar incentive program, Solar Massachusetts Renewable Target ("SMART") Program, regulated by the DPU, has been highly successful in incenting solar. Massachusetts has the second highest density of installed solar megawatts per square mile in the US, followed by Rhode Island.<sup>8</sup> Currently the Company has about 3,000 MW of connected and pending solar facilities in its service territory.<sup>9</sup> The Plan projects that an additional 2 gigawatts ("GW") of deployed solar is needed to achieve Net Zero by 2050. National Grid agrees that investing in a flexible, responsive, and reliable electricity grid is essential to that transformation.<sup>10</sup>

The rapid growth of solar in the Commonwealth already has necessitated modifications to the distribution system to ensure that it can continue to operate safely and reliably with a high penetration of solar, as well as upgrades to the transmission system to support the distribution system modifications. The development of large solar farms has strained the interconnection processes, which were initially developed to support smaller distributed generation facilities

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<sup>8</sup> [U.S. Energy Information Administration](#) (Extrapolation from the data).

<sup>9</sup> National Grid Reply Comments on Straw Proposal at 3, D.P.U. 20-75.

<sup>10</sup> CECP 2030 at 37 and Table 5.

serving on-site electricity needs. Past state policy and solar business models have prompted a significant number of multi-MW solar farms in lieu of building mounted solar installations. When saturation of solar on the electric distribution system was low, this was the preferred business model as multi-MW solar farms cost less to develop on a per kilowatt (“kW”) basis and were less risky than building mount projects. However, as the lightly loaded electric distribution system in rural parts of the state has become increasingly saturated, the costs and time to interconnect these multi-MW solar farms have risen due to the need to now pay for transmission system upgrades to accommodate these multi-MW solar farms. This shift put installed costs of solar farms on par with the installed costs of building mounted solar. Building mounted solar allows for generation to be sited at the load, thereby reducing losses and providing peak load reductions on the existing electric distribution system which can provide for deferral of incremental infrastructure needs. Solar farms provide neither of these benefits; they are remote from the load, thereby increasing losses, and require significant infrastructure to connect to the distribution system which does not offer any opportunity for future deferral of infrastructure. Meeting the Commonwealth’s goal of supporting an additional 2 GW of solar between 2025 and 2030 will require efficient utilization of all forms of solar development. DOER should explore paths to market that send appropriate signals to prioritize development of true distributed generation projects to capture the above-noted system benefits (e.g., potential deferral and reduced losses of generation serving actual on-site loads) while working on solutions to enable continued larger scale greenfield development. In addition, the Commonwealth should consider expanding its strategy for procurement of solar energy to resources outside of the state, where land and development costs have shown to be more available and lower, respectively. Incentive program designs should take account of the increased system

impact and associated interconnection costs of large scale solar to better align with the planning and cost allocation goals currently being explored by the DPU.

In the interim, the DPU has risen to the challenge of interconnecting large amounts of solar facilities under current programs by opening an extensive investigation into revising the distributed generation interconnection tariff. To date, the DPU has issued orders revising the interconnection procedures to incorporate the interconnection of energy storage systems, to provide tools to make the distributed generation interconnection process operate more efficiently, and to provide greater transparency into the transmission studies that are necessary to avoid adverse impacts on the safety and reliability of the transmission system from the aggregation of large solar on the distribution system. The Company applauds the DPU for its vision and its innovative and highly effective administration of this docket (D.P.U. 19-55), which is addressing interconnection issues for high penetration of renewable energy (primarily solar as of today) that are first in the nation.

Deploying an additional 2 GW of solar to achieve Net Zero by 2050 will require anticipatory investments in the distribution and transmission systems, instead of investments in response to the interconnection requests of specific distributed generation facilities. The DPU has opened a potentially ground-breaking investigation into planning for and implementing such anticipatory investments and has offered a Straw Proposal for achieving that. As discussed under E.6, the Company is enthusiastic about the Department's Straw Proposal, which would "require a system planning analysis for infrastructure investment in consideration of clean energy and climate policy objectives, incorporation of DG investments, and development of associated planning criteria."<sup>11</sup> The Department anticipates that these proactive investments will benefit all customers,

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<sup>11</sup> Vote and Order Opening Investigation at 6, D.P.U. 20-75. This proceeding also is investigating the appropriate assignment and allocation of costs for infrastructure investments that benefit all customers.

“by providing the flexibility needed to design optimal solutions that can take into account the evolving needs of the distribution system,” that is, that will result in the “flexible, responsive, and reliable electricity grid” 2030 CECP contemplates.<sup>12</sup>

As the Company discussed in its comments in D.P.U. 20-75, external challenges outside the control of the Company and the other electric distribution companies will inhibit integration of solar into the electric power system if those challenges are not addressed. Chief among those challenges is the lack of long-term state targets for solar and other distributed energy resources and land availability to site large solar arrays.<sup>13</sup> A 2050 megawatt target, including intermediate targets, for the amount of solar the Commonwealth will incent after the current solar incentive programs sunset (currently anticipated to be after 2025) would provide valuable input for the distributed energy resource long-term planning process contemplated in D.P.U. 20-75. The Company would welcome EEA and DOER’s participation in setting such targets and in projecting the location and pacing of future solar development. National Grid has been examining various blockers to the timely development of large solar arrays and other types of renewable distributed generation and potential steps to address these blockers. Project permitting, including environmental permitting, siting approvals, and local authorizations, is a major bottleneck to constructing large solar array interconnections. Depending on the type of project and permits triggered, the permitting process can take two or more years. Expediting permitting is critical to accelerated development of distributed generation. To that end, the Company has identified a number of potential reforms to expedite permitting while still protecting environmental resources and public interests. The most impactful of these reform concepts is the creation of a “one-stop”

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<sup>12</sup> 2030 CECP at 27.

<sup>13</sup> National Grid Comments on Straw Proposal at 48-49, D.P.U. 20-75. The Company also identified a third external challenge: collaboration with ISO-NE to refine the regional wholesale electricity markets to better align with the clean energy mandates of the New England states.

consolidated permit process encompassing all state and local authorizations, which would address timing concerns and provide the certainty needed for the successful planning and implementation of the massive increase in renewable energy infrastructure needed to meet the Commonwealth's goals. This can be done without compromising the Commonwealth's commitment to environmental protection by using established, extensive best management practices and removing unnecessary duplication during the permitting process.

The Company agrees that best land management practices that protect critical Massachusetts species and ecosystems are important. However, these goals will need to be continually balanced with the ability of utilities to construct the infrastructure that is necessary for the growth of renewable energy, as well as land use for the renewable resources themselves. Infrastructure projects necessary to support the growth of renewable energy could include new, expanded, refurbished, replaced or upgraded transmission and/or distribution lines or substations, and the infrastructure necessary to interconnect renewable energy generation to transmission and/or distribution facilities.

An additional avenue EEA could consider to help reduce land-use impacts, in particular from solar development, would be standards regarding the power density of new developments, such as requiring the use of higher efficiency solar modules, and single or multi-axis tracker technology. This would help to boost the expected energy output per acre of newly developed land and lessen overall land use concerns.

#### **Strategy E5: Develop a Mature Offshore Wind Industry in Massachusetts**

National Grid supports the Commonwealth's efforts to work with the Bureau of Ocean Energy Management ("BOEM") and other regional stakeholders to identify new lease areas, coordinate project schedules, and support an efficient, on-pace federal permitting process.



National Grid agrees that to achieve the most efficient and on-pace permitting for these projects, streamlining the BOEM leasing process is important. Moreover, streamlining the permitting for all federal, state and local permits needed for offshore wind projects as well as the associated interconnections and system upgrades is also critical. Specifically, National Grid believes that the Plan must include a comprehensive strategy for streamlining state and local permitting of renewable energy related projects and for engaging with the federal government, not only with respect to BOEM's leasing program, but also with respect to other required federal permits and consultations. Achieving the Commonwealth's 2050 climate goals will require comprehensive coordination and creative solutions from all stakeholders. One major bottleneck, often overlooked, is project permitting, including environmental permits, siting approvals, and local authorizations. Depending on the type of project and permits triggered, the permitting process can take two or more years. This applies not only to new generation facilities, but also to utility projects needed to support renewable generation such as new, expanded, refurbished, replaced, or upgraded transmission and/or distribution lines or substations, and interconnections of renewable energy generation to transmission and/or distribution facilities. These timeframes represent a significant challenge to meeting the Commonwealth's climate goals. Permit streamlining is critical and can significantly reduce the time to secure permits for public utility and renewable energy projects while still achieving the highest levels of environmental protection.

The Company respectfully suggests that the "regional stakeholders" involved in the permit streamlining effort should include the Army Corps of Engineers, the Department of Environmental Protection, the Massachusetts Environmental Policy Act Office, and Coastal Zone Management

(CZM)<sup>14</sup>, in addition to local permitting authorities such as conservation commissions, as well as the utility companies.

Early planning with respect to offshore wind generation projects, as well as the transmission and other interconnection facilities required to bring offshore wind energy onshore, is critical. For the Commonwealth to meet its 6 GW by 2040 goal, EEA will need to look closely at permitting timeframes and take proactive steps to streamline review and permitting timelines for the interconnection facilities. National Grid welcomes the opportunity to work with the Commonwealth in developing permit streamlining reforms.

#### **Strategy E6: Incorporate GWSA into Distribution-Level Policy Considerations**

National Grid supports incorporating GWSA goals into distribution system planning. As National Grid and the other Massachusetts electric distribution companies progress their Grid Modernization efforts with additional three-year investment plans, the value of avoided carbon-dioxide emissions will be an important consideration in assessing the benefits and costs of those investments.

The Company's next Grid Modernization investment plan will align with the Commonwealth's clean energy goals by proposing necessary investments to transition to Net Zero by 2050, when solar and wind are projected to be the majority sources of energy. These proposed investments include advanced meter infrastructure and functionality, investigation into the requirements and functionality that will be needed to integrate a distributed energy resources

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<sup>14</sup> The Company is a member of CZM's Energy and Infrastructure Technical Work Group that supported the development of the Massachusetts Ocean Management Plan. In June of 2020, as part of the 5-year mandatory review of the Massachusetts Ocean Management Plan, the Company submitted comments including specific recommendations on the siting of interconnection facilities. The Company's comment letter to CZM is provided as Attachment A.

management system (“DERMS”) platform with the Company’s advanced distribution management system, and demonstration energy storage system and dynamic curtailment projects.

As discussed under E.4, potentially ground-breaking future state distributed energy resource planning is under consideration in D.P.U. 20-75. The Department of Public Utilities has identified the need for the Distribution Companies to conduct a distribution system planning analysis to identify distribution system infrastructure investments to achieve the Commonwealth’s clean energy and climate policy objectives, in particular, the interconnection of solar and other distributed generation facilities.<sup>15</sup> The Company is enthusiastic about this opportunity and has provided detailed comments describing its current distribution system planning process and a proposal for a future state integrated planning process.<sup>16</sup> This integrated planning process, if implemented, will greatly enhance the ability of the Company to optimize and integrate grid investments to allow for deep electrification, while maintaining affordability for customers. DOER is participating in D.P.U. 20-75, as is the Office of the Attorney General. The Company respectfully suggests that, as the DPU has open dockets on the distribution system planning process, there is no need for legislation to address that process.

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<sup>15</sup> Vote and Order Opening Investigation, Attachment A at 4, D.P.U. 20-75.

<sup>16</sup> National Grid Comments on Straw Proposal, supra, at 16-22.

#### **IV. MITIGATING OTHER SOURCES OF EMISSIONS**

National Grid supports efforts to curb the direct emissions of Massachusetts' small industrial sector by targeting a 45% reduction by 2030 from a 1990 baseline. While the two largest direct GHG emissions from the operation of our electric and gas networks, specifically SF<sub>6</sub> and methane, are addressed by the Department's regulations, National Grid has set even more aggressive internal targets to reduce emissions. National Grid has committed to an 80% reduction in GHG emissions by 2030 from a 1990 baseline. Additionally, National Grid has also set a target for reducing SF<sub>6</sub> emissions 50% from a 2019 baseline by 2030. However, achieving emissions reductions from energy delivery networks must be pursued with caution to ensure that reliability of the system is not jeopardized. As illustrated by recent events in Texas, energy delivery interruptions can have severe impacts.

##### **Strategy N1: Target Non-Energy Emissions That Can Be Abated or Replaced**

Based on its recent experience in substantially reducing SF<sub>6</sub> emissions from its electrical transmission system in Massachusetts and adjoining jurisdictions in New York and Rhode Island, National Grid does not believe that it is necessary or appropriate for the Commonwealth to adopt phase out or replacement requirements for SF<sub>6</sub>-containing gas insulated switchgear in line with those proposed in 2020 by California regulators or to otherwise tighten the thresholds and underlying policy concerning SF<sub>6</sub> emissions from such equipment incorporated in MassDEP's Reducing Sulfur Hexafluoride regulation (310 CMR 7.72). Over the past five years, National Grid has reduced its SF<sub>6</sub> emissions well beyond that of the Massachusetts GHG emissions target of 45% from 1990 to 2030. These reductions have been achieved through targeted equipment replacements, improved tracking of SF<sub>6</sub>, more expedient leak repairs, improved SF<sub>6</sub> handling procedures, and enhanced equipment design. Although National Grid has proactively engaged

with circuit breaker manufacturers regarding the availability of non-SF<sub>6</sub> alternatives, there is currently no feasible non-SF<sub>6</sub> alternative gas (based on properties such as operating temp, global warming potential, operating history, and longevity) that is presently on the market or that is likely to be within the 2030 timeframe. That said, 115 kilovolt (“kV”) vacuum circuit breakers are expected to be available in 2022, but the design is still immature with no units yet in-service.

Further, even if non-SF<sub>6</sub> high voltage equipment were available today, the impact on 2030 emissions would be small. National Grid has approximately 1,400 pieces of electrical operating equipment in Massachusetts that contain SF<sub>6</sub>. Accordingly, assuming National Grid’s usage of such equipment is representative of other utilities in the Commonwealth, relevant equipment requirements in Massachusetts are not significant enough to leverage manufacturers to expedite the development of non-SF<sub>6</sub> alternatives. Equipment phase-out mandates to encourage development of non-SF<sub>6</sub> alternatives would instead be better initiated on the federal level.

## **V. PROTECTING OUR NATURAL AND WORKING LANDS**

Energy delivery networks by their very nature must be distributed throughout the Commonwealth and National Grid's operation and maintenance of its assets may take place in areas of environmental importance. National Grid understands the important role played by environmental habitats from the local ecosystems to combating climate change. In fact, the Company has recently committed to enhancing the environment on 10% of its fee-owned lands. However, it is important to balance environmental protections and enhancements with the need to maintain and expand the network as needed to facilitate the delivery of clean energy.

### **Strategy L1: Protect Natural and Working Lands**

As stated in National Grid's Environmental Sustainability Policy, National Grid takes its responsibilities to the environment very seriously. As part of its planning process for every project, National Grid evaluates wetland impacts and strives to avoid and minimize temporary and permanent impacts to the greatest extent possible. Where possible, the Company seeks to avoid and minimize wetland impacts by:

- using existing access routes;
- avoiding and minimizing stream and wetland crossings;
- conducting work in wetlands manually;
- using construction mats in wetlands to minimize soil disturbance and rutting;
- coordinating the timing of work to be least impactful wherever possible; and
- considering alternate routes or work methods to minimize impacts in wetlands.

In developing and funding an expanded suite of incentive-based programs to achieving no net-loss of forest and farmland, EEA must not impede the ability of utilities to construct the infrastructure that is necessary for the growth of renewable energy. Infrastructure projects

necessary to support the growth of renewable energy could include new, expanded, refurbished, replaced or upgraded transmission and/or distribution lines or substations; and infrastructure necessary to interconnect renewable energy generation to transmission and/or distribution facilities. As discussed in the Company's comments on Strategy E4, the Company already implements a number of strategies to protect habitats and species.

In continuing to protect and restore inland and coastal wetlands, EEA should recognize the importance of utility maintenance exemptions in regulations to allow for maintaining, refurbishing, replacing or upgrading transmission and/or distribution lines or substations. Revisions to the Massachusetts Environmental Policy Act ("MEPA") are currently being considered relating to the replacement and maintenance provisions for utilities; these should be strengthened and not weakened.

National Grid recommends that EEA develop a state in-lieu fee program tied to the Massachusetts Wetlands Protection and Clean Water Acts. Such a program could be a funding mechanism for preserving forest and farmland. Current mitigation options under the Wetlands Protection Act and regulations and the Water Quality Certification provisions of the Clean Water Act and regulations are quite limited. This puts utility companies at risk at having their projects or portions of their projects denied or delayed as they attempt to develop mitigation plans. National Grid urges the Commonwealth to consider implementing an in-lieu fee program that would provide permittees an option to use in-lieu fee payments as mitigation for their project impacts and would allow for more significant efforts (including the aggregation of multiple project payments) to restore and enhance inland and coastal wetland and wetland buffers, including forested wetlands and farmland rather than each regulatory program requiring differing mitigation standards be met, often fragmenting the opportunity to realize more comprehensive ecosystem benefits.

**Strategy L2: Manage for Ecosystem Health and Enhanced Carbon Sequestration; and  
Strategy L4: Develop Sequestration Accounting and Market Frameworks**

As evidenced by its October 2020 announcement of an ambition to achieve Net Zero by 2050, National Grid has positioned itself as a leader in the transition to a clean energy economy by aggressively targeting reductions in our greenhouse gas emissions. While emission reductions must be a priority, National Grid recognizes the importance of understanding and enhancing natural sequestration and acknowledges there also is a role to be played by carbon off-setting. As such, National Grid supports Strategy L2: Manage for Ecosystem Health and Enhanced Carbon Sequestration and Strategy L4: Develop Sequestration Accounting and Market Frameworks.

National Grid manages an extensive network of Right-of-Ways which, while performing the intended vital function of energy distribution and transmission, also provides valuable habitat for birds, pollinators and other wildlife. There also may be a potential opportunity for this resource to be managed to support carbon sequestration through the conduct of research and identification and implementation of best management practices. While climate change is certainly a global issue, National Grid also supports the development of a local carbon sequestration market framework as encouraging local mitigation efforts is important to build community awareness and engagement. This approach is consistent with National Grid's internal Carbon Offsetting Policy which, following the completion of all reasonable steps to reduce emissions, prioritizes the procurement of local carbon sequestration offsets.

**VI. CONCLUSION**

National Grid appreciates the opportunity to submit these comments on the Interim Clean Energy and Climate Plan for 2030. National Grid is prepared to work together with the administration to advance the Commonwealth's ambitious 2030 target in ways that maintain the affordability, resilience, and reliability of our energy system. National Grid hopes that the



recommendations offered herein will help advance that goal in the most cost-effective way possible for consumers by reducing barriers to innovation or adoption, encouraging efficient investment of capital, incentivizing the most cost-effective emissions reductions, avoiding policy duplication and keeping customer affordability and choice at the forefront. National Grid looks forward to supporting the Commonwealth as it further develops these recommendations and remains committed to doing our part to help the Commonwealth advance decarbonization across the economy while ensuring affordability, resilience and reliability.



**Wendy B. Levine**  
Assistant General Counsel  
Environmental Permitting

June 24, 2020

**By E-Mail ([lisa.engler@state.ma.us](mailto:lisa.engler@state.ma.us))**

Lisa Berry Engler, Director  
Massachusetts Office of Coastal Zone Management  
251 Causeway Street, Suite 800  
Boston, MA 02114

**Re: MA Ocean Management Plan Review**

Dear Lisa:

Boston Gas Company, Massachusetts Electric Company, Nantucket Electric Company and New England Power Company, each d/b/a National Grid (collectively, “National Grid”), respectfully submit the following comments as part of the second Massachusetts Ocean Management Plan review and update. National Grid is an international electricity and gas company delivering energy to millions of customers across Great Britain and the northeast United States, with gas and electric transmission and distribution operations in Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

As you requested, National Grid’s comments focus on notable trends and issues associated with coastal/ocean-related energy and infrastructure, as well as recommendations for priority science and data actions for the next five years of the Ocean Management Plan. National Grid submits these comments in support of the Commonwealth’s path-breaking work on marine protection and planning, which is grounded in science and developed with extensive public and stakeholder input. In providing these comments, National Grid seeks to ensure that the needs of the Commonwealth’s energy users and the goals of the Commonwealth’s renewable energy policy remain in the forefront of considerations as the five-year review and update of the Ocean Management Plan are finalized.

### **Notable Trends and Issues**

Few trends have been as impactful, since the last Ocean Management Plan update, as the acceleration of offshore wind development in the Commonwealth. In 2016, Massachusetts established its initial requirements for procurement of offshore wind in Section 12 of “An Act to Promote Energy Diversity,” St. 2016, s. 12 (the “Energy Diversity Act”), enacting Section 83 of “An Act Relative to Green Communities,” St. 2008, c. 169. Section 83C set the initial rules and requirements for offshore wind procurement in Massachusetts, requiring the first 1600 MW of offshore wind to be solicited and under contract by 2027. Ultimately, this procurement was completed seven years ahead of schedule. In 2018, new legislation, “An Act to Advance Clean Energy,” St. 2018, c. 227, s. 21(a) (the “Clean Energy Act”), directed the Massachusetts Department of Energy Resources (“DOER”) to study whether to procure an additional 1600 MW of offshore wind generation by 2035, and whether to solicit independent offshore wind transmission. In 2019, DOER concluded that Massachusetts electric distribution companies

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should procure an additional 1600 MW of offshore wind “if found to be cost-effective,” possibly by way of two 800 MW solicitations to be conducted in 2022 and 2024.

These actions by the Commonwealth are taking place alongside federal agency development of standards and guidelines for offshore wind projects that will have profound effects on the offshore wind industry. Further changes are being driven by the array of parties, including developers and operators, drawn to this active offshore development environment. The agreements governing the relationships between these parties, including between developers and utilities, continue to evolve as well. In sum, Massachusetts has catalyzed a level of offshore wind activity that shows no signs of abating.

The following comments address siting for electric transmission cables for conventional generation and siting for gas pipelines, but more particularly address siting for transmission cables to deliver electricity from offshore wind projects.

### **1. Siting Constraints for Cables and Pipelines**

As National Grid commented during the 2014 Ocean Management Plan review, the Ocean Management Plan delineates six areas of “special, sensitive or unique” (“SSU”) resources that apply to cables, and seven SSUs and two types of concentrated water-dependent uses that apply to gas pipelines. Cables and pipelines are presumptively excluded from areas of the specified SSUs, and pipeline proponents must “avoid, minimize, and mitigate impacts” to concentrated areas of the specified water-dependent uses. These exclusions and requirements could present major barriers to projects with significant public benefits, including those that support state, regional and federal renewable energy initiatives. Likewise, they may inhibit utilities’ efforts to increase electrical reliability, decrease electrical costs, and combat global warming by using renewably generated power.

The 2015 Ocean Management Plan’s inclusion of four preliminary offshore wind transmission cable corridors for further survey, characterization, and assessment was a positive step. However, as shown in Figure 29 of the 2015 Ocean Management Plan, there remains almost no way to bring an electric cable to shore between Cape Ann and outer Cape Cod. Similarly, according to Figure 30 of the 2015 Ocean Management Plan, there is almost nowhere in Massachusetts coastal waters to site a natural gas pipeline outside of the applicable SSUs and water-dependent use areas. To bring a cable to shore between Cape Ann and outer Cape Cod, or to bring a pipeline to shore almost anywhere on the Massachusetts coast, project proponents will be forced to overcome the presumption of exclusion from SSUs, and pipeline proponents will also have to avoid, minimize and mitigate impacts to the areas of concentrated water-dependent uses.

Additionally, it appears that the preliminary offshore wind transmission corridors were identified solely based on the SSU area mapping. They do not appear to consider any engineering or installation constraints, including consideration of water depth and proximity of landfall sites to viable electric grid interconnection locations. Moreover, the Ocean Management Plan entirely prohibits transmission cables in the Cape Cod Ocean Sanctuary, meaning that for a project to connect to Boston or the North Shore it would be required to remain in federal waters, which would increase the cable length and any anticipated impacts.

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These constraints may especially impact the burgeoning offshore wind industry. Given the pace of offshore wind development and the number of projects in planning or under development, there will be an increasing need to accommodate offshore cables to deliver renewable energy to onshore users. These cables will need to be located in various areas within the Ocean Management Planning Area, including within the SSUs. To accommodate this need, the Ocean Management Plan should employ a flexible framework that acknowledges the environmental benefits to be gained from transmission projects supplying offshore wind generated power to Massachusetts households and businesses.

There are various possible solutions to this problem, some of which National Grid identified in its comments on the 2014 draft update.

- **Revisit SSU delineations.** The extent of the North Atlantic Right Whale Core Habitat SSU in Cape Cod Bay should be re-evaluated. It does not appear to be justified, because it is based only on 2013 data, and it presumptively excludes cables from Cape Cod Bay. As shown in Figures 22 and 23 of Volume 2 of the 2015 Ocean Management Plan, basing the SSU delineation on 1998-2014 data (or any more current data) may leave an open corridor through Cape Cod Bay. Likewise, the area of North Atlantic Right Whale core habitat mapped just south of the southern edge of Martha's Vineyard should be reconsidered.

- **Reduce presumptive exclusions.** The list of SSUs (and, for pipelines, water-dependent uses) from which cables and pipelines are presumptively excluded should be more limited. For example, whale habitat can be addressed with time-of-year restrictions; cable installation on areas of hard and complex sea bottom can sometimes be accomplished using cable installation methodologies that do not require blasting or dredging for the offshore portion (jet plowing, controlled flow excavation, mass flow excavation, or other similar techniques) and using horizontal directional drilling near shore.

- **Identify optimal routes that are presumptively permissible.** Given the constraints imposed by the Stellwagen Bank National Marine Sanctuary and the Cape Cod Ocean Sanctuary, any offshore cable bringing power from the north to any location between Cape Ann and Provincetown must go through a narrow corridor off of Cape Ann (see Appendix Figures 4-1 and 4-2 in the 2015 Ocean Management Plan). Therefore, there is a need to create presumptively acceptable routes within that corridor. In doing so, it will be vital to provide adequate spacing between utility lines for initial construction and future repairs. Repairs typically require more corridor width than the original installation. In addition to these presumptively permissible routes, new projects should continue to be permitted in other locations if they meet the existing performance standards.

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**Exempt Public Necessity or Convenience Projects from SSU Restrictions.** A transmission project that is found to be a public necessity or convenience project could be exempted from the SSU presumptive exclusions on the condition that an appropriate mitigation fee is set aside to mitigate for any actual, permanent impacts to species or habitats. The mitigation fee would be established in relation to the mitigation fee schedule presented in the 2015 Ocean Management Plan given the acknowledged public benefits of such projects.

## **2. Evaluating Offshore/Onshore Interconnections**

The Ocean Management Plan should encourage interconnections from offshore generation that take advantage of existing infrastructure where possible. For example, the former Brayton Point Power Station presents a logical choice for interconnection because the surrounding transmission system was previously developed to accommodate the former on-site generation. Other viable interconnection points are identified in the ISO New England 2019 Economic Study - Offshore Wind Transmission Interconnection Analysis (available at <https://www.iso-ne.org/static-assets/documents/2020/05/osw-econstudy-transmission-interconnection-analysis-may-2020-nonceii.pdf>).

The Ocean Management Plan should identify corridors for offshore transmission cables that prioritize efficient interconnections with existing onshore infrastructure. In doing so, the Ocean Management Plan should incorporate analyses undertaken, including future studies, by ISO New England and others.

## **3. Regulatory Coordination and Streamlining**

New transmission facilities are subject to an array of reviews and permitting requirements, including by the Energy Facilities Siting Board, the Department of Public Utilities, the Massachusetts Department of Environmental Protection (MassDEP), the Massachusetts Environmental Policy Act Office, as well as federal and local agencies and agencies in neighboring states. The Ocean Management Plan should promote efficient review and permitting by seeking to coordinate reviews and to minimize potential conflicts between reviewing agencies and the Commonwealth's renewable energy goals. This effort could include using the Ocean Management Plan to: (1) actively coordinate the environmental review and permitting process between agencies; (2) establish presumptions in favor of siting projects that are consistent with Ocean Management Plan-designated corridors; and (3) prioritize and rank the sensitivity of resource areas and habitats to guide siting decisions and environmental impact reviews.

### **Other Comments on the Ocean Management Plan**

**1. Mitigation Fee Schedule:** The mitigation fee schedule presented in the 2015 Ocean Management Plan accounts for the appropriate set of factors and provides a reasonable degree of transparency and predictability. However, as National Grid has commented before, the mitigation fee schedule should permit a fee reduction for public necessity or convenience projects.

Lisa Berry Engler, Director  
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**2. Maintain Definitions for Bottom Habitats:** To foster a sense of predictability and consistency, the updated Ocean Management Plan should maintain the definitions for delineating hard bottom and complex bottom habitats that appear in the 2015 Ocean Management Plan.

### **Priority Science and Data Recommendations for Next Five Years**

After more than ten years of Ocean Management Plan implementation, the Commonwealth should continue to refine existing data and to collect additional data as new data gaps are identified.

**1. Eelgrass Mapping:** The last publicly available eelgrass mapping performed by the state occurred in 2015, when the MassDEP released mapping that subsequently was incorporated into the Ocean Management Plan. Eelgrass is an ephemeral resource, so updated nearshore mapping of eelgrass would be useful as part of future Ocean Management Plan reviews. It also would assist offshore wind developers seeking to identify potential cable routes that can avoid direct impacts to eelgrass beds, and it would be useful to estimating the impacts associated with sediment dispersion caused by cable installation activities.

**2. Seabed Characterization:** High Resolution Geophysical (HRG) Survey and Acoustic Basement Mapping would provide additional certainty regarding sediment characterization. HRG technology continues to evolve, so an updated, state-led HRG survey should be conducted. It would benefit planning for all projects, specifically by identifying hard bottom habitats, potential historical or archaeological features, rock interfaces, and the top of glacial till. If the State does not undertake an updated HRG survey, the Ocean Management Plan should identify preferred seabed characterization methodologies.

Similarly, the state should undertake a coastal geological assessment for on-shore landing areas to assist in modeling or confirming the presence of sufficient cable landing burial to outlast natural sand deposition cycles and coastal storm surges.

**3. Performance Standards for North Atlantic Right Whale Core Habitat:** The performance standards for core whale habitat may warrant re-evaluation, specifically to determine whether to alter the performance standards from “avoidance” to a combination of time-of-year restrictions, vessel speed limits, and marine species observer requirements.

Lisa Berry Engler, Director  
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**4. Munitions and Ordnance Study:** The state should undertake a survey of Munitions and Explosives of Concern and Unexploded Ordnance (MEC/UXO) to assist in characterizing potential transmission corridors given that military records may be confidential and given that the expense of identifying and evaluating MEC/UXO on a project-specific basis can be substantial.

National Grid appreciates the opportunity to provide these comments and is committed to continuing to work with the Commonwealth on the development and implementation of the Massachusetts Ocean Management Plan. Thank you for your consideration of our comments.

Yours truly,



Wendy B. Levine

cc: J. Newman (electronic only)  
A. Agostino (electronic only)  
D. Campilli (electronic only)  
P. Wall (electronic only)  
N. Hitti (electronic only)

**To: Massachusetts Office of Energy & Environmental Affairs**

**From: Kathleen O'Connor and Frederick Spence  
North Rd, Westhampton, Mass 01027**

Dear Secretary Theoharides and Decarbonization Team:

We would like to begin by thanking everyone who contributed to the 2050 Roadmap and the CECP. We appreciate the vast amount of work that has gone into this critical project. As invested members of a complex society facing enormous challenges, we value this opportunity to contribute, even at this late stage, to the thinking needed for the survival and thriving of all inhabitants of Massachusetts, and to the articulation of our common values that must guide all policy.

To the degree possible, our comments are listed categorically in correlation to the sections of the CECP, for ease of review.

1.4 "A New Goal: 45% in 2030."

We support a 50% carbon emissions reduction target for 2030, in accordance with senate bill S.9. We view this target as feasible, affordable and necessary. The Governor's concerns about the difference in cost between 45% and 50% do not convince us otherwise. The cost of doing less will certainly be greater, in terms of both economics and life in general.

1.5 Policy Analysis Process.

Core values are at stake. Values about how we interact with one another and with the environment upon which we all depend. This cannot be left to a panel of "experts" to decide. Roadmap 2050 is based on the goals of "stakeholders" which turn out to be financial interests that benefit from the current economy and are therefore resistant to the deep changes required to create a replacement economy more in sync with the natural world. Where we need bold goals and concerted action, we find only piecemeal incrementalism in an effort to preserve business as usual.

Social Cost of Carbon.

Conspicuous by its absence is any reference to the Social Cost of Carbon (SCC), which provides an expert estimate of the societal cost of adding one metric ton of CO<sub>2</sub> to the atmosphere. The SCC has become a standard component of most recent efforts to develop science-based policy to address the global climate crisis. Based on the best available science and economics, the SCC gives the estimated monetary value of the social harms incurred by adding a given amount of CO<sub>2</sub> to the atmosphere. The recent Technical Support Document by the US Interagency Working Group ably discusses the basis of the federal SCC estimate and the need for further refinements going forward. Recently, there has been a growing awareness that earlier estimates of the SCC were much too low. The emerging consensus is that the SCC should be more than \$100. New York state recently adopted a figure of \$125, and qualified opinion increasingly expects that the revised US SCC, due January 2022, will be similar or even larger. This is almost two and a half times the interim value adopted by the Biden administration, and significantly increases the value of investing today to prevent climate harm in the future. The SCC has become an invaluable tool in policy making by allowing meaningful comparisons of different policy options, and its complete absence from the 2050 Roadmap process and the current CECP



2030 is disturbing, to say the least. On the other hand, it is refreshing to see that the climate change bill (S.9) embraces the social value of carbon in the context of environmental justice concerns.

As an example of how the SCC could inform climate policy in the Commonwealth, consider the potential value of keeping our state-owned forests intact to encourage maximum carbon sequestration. Estimates of the additional carbon sequestered in our forest range between 1 and 1.5 metric tons of carbon per hectare per year (and thus, 3.67 to 5.51 tCO<sub>2</sub>eq/ha/yr) according to the Roadmap 2050. Since our state-owned forests cover some 214,000 hectares, we calculate that they can be expected to sequester between 214,000 to 321,000 tC/yr (or 785,380 to 1,178,070 tCO<sub>2</sub>eq/yr), which would save the Commonwealth between \$98 million and \$147 million each year (using SCC = \$125) by simply leaving them alone to get on with the job. Between 2020 and 2050, this would come to between \$2.9 billion and \$4.4 billion, and all this with no additional draw on the public purse. Moreover, carbon sequestration is only one of a number of co-benefits that would accrue by leaving the forests alone and thereby making the overall social value of forest protection even higher. Failure to include SCC calculations in the land sector analysis is an example of policy negligence that should be immediately corrected.

More broadly, available SCC estimates favor significant investments in climate mitigation today in order to avoid climate harm in the future. The roughly 71 MMTCO<sub>2</sub>eq emitted by our state in 2020 incurred a social cost of almost \$9 billion, and that figure increases dramatically each year we postpone action. We are clearly investing far too little rather than any too much.

#### A Flawed Public Participation Process.

We are further dismayed by the way in which the public participation process has unfolded. When the public meetings to launch this process were postponed on January 28, 2021, with only two minutes' advance notice. We were informed that there would be no Q&A opportunity (which was not the case originally). We have attempted to work around this problem by emailing questions, but have still not received useful answers to our questions. We object to this failure to facilitate our involvement and to the one-week turnaround interval between webinar and deadline.

In regards to the Roadmap study, we would like to know the reason why our tax dollars were spent to produce pre-weighted comparisons that disregard the best management practice available in terms of carbon benefits. It cannot be unintentional, as the concept of Proforestation and a selection of supporting literature was brought to the attention of the EEA's Head of Land Use Policy in November of 2019, and to the Decarbonization Team at the Roadmap public meeting in February of 2020. We request that a Proforestation approach be incorporated as an alternative land use scenario. We understood that the study would "include a no-cut option." This did not happen.

#### B3 Strategy Actions: "Clean Heat."

Establishing state policy to increase the burning of woody biomass for heating is not a viable alternative, because it burns dirtier than coal and emits much more carbon than any fossil fuel. (See section E3 for details.) Burning biomass must be removed from consideration and classification as a renewable or green energy source forever.

4.2 "Getting to 45% in 2030: > 4.2 MMTCO<sub>2</sub>e Reduction: 1 GW of new transmission to Quebec;"

E1 Strategy Actions: ..."clean hydropower via a new high-voltage transmission line."

Hydro Quebec and megadams generally are erroneously categorized as "clean energy." We would like to see proper analysis of carbon and methane emissions throughout the flood zone. Furthermore, it must be emphasized that Hydro Quebec has and continues to pollute the water, including the release of mercury from flooded land, and to deprive this region's First Peoples of their traditional sustenance, cultural identity and land use. These include Abenaki, Anishinaagbe, Atikamekw, Cree, Malecite, Mi'kmaq, Innue, Naskapi, Iroquoian, Wendats and Haudenosaunee. Finally, the construction of new transmission lines to bring increased Hydro Quebec electricity to Massachusetts would involve massive deforestation and carbon release. We do not support the import of energy from this source, and must object to the proposed increase.

E3 Strategy Actions:

Review of current attribute markets to ensure those programs continue to support "on pace" clean energy deployment in a strategic, cost effective way. Per unit of energy produced, power plants using forest biomass for fuel emit 300-400% more CO<sub>2</sub> than fracked gas. Supplying such a dirty source to our grid is contrary to the goals of the Global Warming Solutions Act. We are doing worse than that now, by exporting woody biomass from our state forests. In fact, 50% of the trees cut down in our state forests face rapid incineration in hungry power plants. There is no place for such a practice in these times. What belongs in any Clean Energy and Climate Plan is an absolute end to using forest biomass as an industrial fuel.

Chapter 6.1. "Protecting our Natural and Working Lands:" Forest Carbon.

The CECP states as a fact that, "The 2050 Roadmap determined that Massachusetts forests have the capacity to sequester about 5 MMTCO<sub>2</sub>e per year from now through 2050." This is a misleading figure that ignores the very Roadmap study foundational to the plan, which determined that our forests currently have the capacity to sequester "between 5 and 9.2 MMTCO<sub>2</sub>e" (emphasis added). At the upper end of this range, the figure EEA chooses as absolute is nearly doubled. Why is this being done? Theoretically, estimating high would facilitate at least on paper that net zero is more attainable. The EEA might answer that they are being conservative in order to put pressure on the state to dig deeper for emissions reductions, but that seems unlikely, since it is stated that we cannot meet our own goals without relying heavily on other regions to sell us their carbon credits.

A hint as to "why" may be found in the discrepancy between science-based estimates of our forests' storage capacity and the CECP. The Roadmap study shows that our forests' carbon stock growth potential is 49% by 2050, but the preselected conditions by the EEA for scenario-building result in significantly lower figures ranging from 36-39%. This difference indicates that the state never intended to consider maximizing the carbon benefits that our forests can provide. The Decarbonization Team did not have the Cadmus group develop a "no-cut" scenario, even after assuring members of the public that they would. Instead, the office had the Roadmap built to show four land use scenarios that yielded overall similar results and robbed us of the realization of 13% more carbon storage. The foregone conclusion is that, over the next thirty years, we will lose 3 to 4.5

times more live tree carbon from harvest than from land use change due to development. This is irresponsible manipulation of science-based analysis which is leading to faulty policymaking where the stakes could not be higher.

L1. Strategy Actions: "Protection and restoration of wetlands."

As with forests, it is more important to protect existing wetlands than to plan on their destruction and restoration. However, we recognize that our coastal wetlands are already foreseeably jeopardized by ocean level rise; the same forces will challenge our ability to restore them. Site specific, scientific analysis should be done to determine whether there are viable solutions that actually benefit the climate. Wetlands and forests together comprise the bulk of our carbon stores, so we are glad to see the EEA taking them into consideration.

"No net loss of forest and farmland." The Resilient Lands Initiative calls for "No Net Loss" of farms and forests. We caution against simplistic thinking in this regard. "Keeping forests as forests" is not good enough, because not all forests are equal. Comparing a broad range of forest management approaches with a range of harvesting frequency, Nunnery & Keeton of UVM found that "even with consideration of C sequestered in harvested wood products, unmanaged northern hardwood forests will sequester 39 to 118% more C than any of the active management options evaluated." We can no longer ignore these realities for the convenience of land use planning and resource extraction and consumption.

L2. Strategy Actions: "Best Management Practices."

Today's Best Management Practices ("BMPs") must center on surviving climate disruption. The outdated notion that "sustainable yield" forestry provides the greatest public good over the long-term must be re-evaluated. We do not suggest the complete elimination of wood products, but we must face up to the reality that their production directly impinges upon all the other benefits our forests provide. Therefore, prioritization is called for. Allowing optimal forest carbon benefits of both storage and sequestration, which are immediately available through a simple hands-off approach, must be considered priority number one in these times of climate emergency.

Sadly, the guiding document for BMPs, which has not been updated in nearly a decade, mentions carbon benefits only once, in its opening paragraph, and promptly dismisses the implied need with the fallacious claim that "sustainable forestry" will take care of it. New guidelines must be written to recognize the scientific fact that the largest 1% of trees more than pull their weight by storing approximately 50% of the "above-ground live tree biomass" in a forest. Not only do the largest trees store the most carbon, but they sequester carbon at a higher rate than smaller trees. Land use planning and all tree harvesting incentives, whether by Chapter 61 or any other statute or policy, must be reconsidered in light of this reality, especially in view of the fact that the trees targeted by commerce are the same 1% doing the most to mitigate climate disruption. Clearly, Proforestation is by far the best terrestrial "climate solution" and the most beneficial of all BMPs.

We welcome further research; enhanced carbon accounting of the living environment is much needed. But we fear a familiar thumb on the scale with the emphasis on "sustainable forest management practices," which have always been focused on sustaining the production of wood-products with little regard for the other benefits that

forests provide. We must insist on a fair process with full and careful consideration of Proforestation and a genuine recognition of the public as a stakeholder, and the opportunity for public involvement from the onset of study development.

L3 Strategy Actions: "Incentivize the regional use of harvested wood in long-lived products, such as CLT and wood-based building insulation."

This strategy embraces the vision of the wood-product industry to increase timber production and use lower grade wood for construction and completely ignores the critical literature on the "Myth of Substitution."<sup>12</sup> Although some advantage may be gained by using wood products to replace more carbon-intensive building materials, this rarely occurs in practice. All too often, the use of both increases, and we end up even worse than before. As we have repeatedly emphasized, logging reduces carbon sequestration by forests. In the face of the climate emergency, we must question the value of wood-products in terms of the foregone sequestration their production requires. Rather than providing a balanced evaluation of the potential of long-lasting wood products to partially offset the emissions associated with logging, the CECP fully endorses the industry-generated and widely-marketed notion that durable wood products are an effective way to mitigate climate disruption., Furthermore, only living trees continue to capture and store carbon and do so for decades or centuries to come.

L4 Strategy Actions: "Support a Regional Carbon Market."

That Carbon Markets represent the optimal approach to managing the transformation to a zero-carbon world is simply assumed without any justification whatsoever. This is remarkable given the extremely uneven performance of carbon markets elsewhere. We are deeply suspicious that a global climate crisis that has been referred to as "the largest market failure in history" can be addressed by creating new markets of questionable value. This looks like another pseudo-solution dreamed up by an unhealthy collaboration between technocrats and financial stakeholders. Since we all share the same atmosphere, why not push our regional neighbors and the federal government to turn logging-vulnerable Green Mountain National Forest and White Mountain National Forest into fully protected National Parks. Together these forests comprise some 465,390 hectares yielding an annual social benefit of between \$213 million to \$320 million (or a projected \$6.4 billion to \$9.5 billion over 30 years). We suggest that taking advantage of such low-hanging fruit is vastly simpler and much more cost effective than expending time, effort, and political capital to devise necessarily complex market schemes of questionable utility.

Conclusion

We wish to recognize the hard work of many, those who have had a hand in creation of the CECP, those who are contributing their knowledge and ideas by commenting, and the many, many others who are actively engaged in identifying and manifesting real solutions. We celebrate collaboration and hope that the EEA will work more closely with the residents of this Commonwealth, in recognition that our society reflects the values and creativity of all its people.



# The Commonwealth of Massachusetts

HOUSE OF REPRESENTATIVES  
STATE HOUSE, BOSTON, MA 02133-1054

**MICHELLE CICCOLO**  
**STATE REPRESENTATIVE**  
15<sup>TH</sup> MIDDLESEX DISTRICT

March 21, 2021

Secretary Kathleen A. Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

## **RE: Draft Clean Energy and Climate Plan**

Dear Secretary Theoharides:

Thank you for the opportunity to comment on the Baker Administration's draft Clean Energy and Climate Plan. In my capacity as the House Chair of the Zero Waste Caucus, I have provided a separate letter that deals exclusively with waste management and incineration issues. This letter is dedicated to commenting on the areas of the plan that deal with alternative energy issues and emissions reductions from undesignated categories. Specifically, I wish to recommend several programmatic opportunities and a regulatory change that I believe the Administration should consider pursuing in order to accelerate emissions reductions and keep the Commonwealth on the necessary path to meet our climate mandates.

Relative to strategies discussed in Chapter 3 of the CECP, I offer the following. You are likely aware of the Commonwealth's PACE program for commercial properties. Known as the "*Property Assessed Clean Energy (PACE)*" program currently being operated by MassDevelopment, PACE financing enables commercial property owners to finance energy efficiency and conversion projects through private banks while paying the loans off over a longer period of time through their property tax assessment bills. This longer amortization allows the payback period to be matched up with the energy cost savings and removes the obstacle of the high upfront costs of these improvements. This is especially useful for commercial investors who typically do not keep these investment properties beyond five years, thus making longer term energy investments unattractive. However, the PACE program could use a few modifications to make it more effective. This is especially relevant to the strategy B-1 discussed in the CECP on page 30, which notes the goal of "limiting the number of new buildings and building energy systems that must later be retrofitted." First, the enabling legislation prevents new construction projects from being financed through this vehicle. As I understand it from program administrators, Commercial PACE for new construction would significantly accelerate the utility of this program and increase the rate at which commercial buildings are built to higher clean energy standards. This simple change could fix this and expand the usage of this program, and the change is likely available through a regulatory avenue. I strongly recommend that the eligible project definition in statute remove the applicability of financing the expansion of natural gas lines. As clean energy options have expanded, it is no longer desirable to "switch to natural gas" as a cleaner fossil fuel, and funding these

projects runs completely contrary to all of the state's energy goals. We know now that all fossil fuels should be phased out, and the Commonwealth should not be in the business of facilitating the expansion of natural gas in any form. In order for PACE to be more widely used, I also strongly recommend that EOEEA work with DOER and MassDevelopment to market the PACE program more aggressively in order to increase the number of builders taking advantage of this opportunity. For your reference, I have filed *An Act to expand eligibility for the Commercial Property Assessed Clean Energy (PACE) Program*, HD.3501, which makes the two definitional changes I recommend above, expanding the option to new construction and preventing the financing of natural gas expansion lines.

On the residential side, there is currently no Residential PACE incentive program offered in Massachusetts. Strategy B2 in the plan notes that “the deployment of electric and other clean HVAC systems, as well as building envelope improvement retrofits across the existing building stock, must rapidly scale.” The Administration should work with the appropriate state agencies to develop a Residential PACE program and make it widely available across the Commonwealth. I believe this can be done within explicit legislative authorization, but in case it is not, I have filed HD.3476, *An Act establishing a residential property assessed clean energy (R-PACE) program in the Commonwealth*, should it be necessary to have enabling legislation to allow this to move forward. With so many baby-boomers still in single family homes, it is hard to convince folks to do major energy upgrades on their residences that they may not plan on keeping for decades to come. Again, the upfront costs of these improvements balanced against the longer-term payback period from the cost savings prevent many homeowners from undertaking them. If a residential PACE program were in place, homeowners would be more likely to make the upgrades knowing that if they decide to sell their home before the improvements have paid for themselves, the future owner will take over the payments for the improvements within their property tax payments. R-PACE provides a way to have energy costs amortized for a longer period of time and to pass the unfinished payments off to future owners so that those benefiting from the improvements pay for the costs while living in the home.

Chapter 5 relative to “mitigating other sources of emissions” does not appear to capture data on small hand-held equipment. However, some states are starting to track and monitor these emissions and have discovered they play a significant role in the release of various VOCs and other harmful emissions. Massachusetts should develop a protocol to begin to track and monitor this equipment to determine how significant a role it plays. Moreover, in order to meet our net zero reductions by 2050, more will need to be done in this area. Relative to small motors and their impact on emissions, I have filed HD.3466, *An Act to establish a grant program for low noise, low emissions landscape maintenance equipment*. My community's DPW has been experimenting with commercial grade electric equipment with great success, but the equipment still costs more than market rate gas-powered. To accelerate the adoption of these new technologies, the Administration should run an incentive program to help the conversion occur. My bill proposes a municipal grant coupled with an interest-free loan program for private landscape companies. This is an area that I believe needs attention because small two- and four-stroke motors have not been regulated to the extent larger vehicles and equipment have been. This means there are no filters or catalytic converters (like on vehicles), and the resulting chemical releases are higher than would be expected. With the vast majority of landscape jobs being low-wage, the workers themselves in this field are disproportionately minorities, people of color, and immigrants. As COVID-19 has laid bare, the disparate health outcomes for our BIPOC community are unacceptable, and we need to take a hard look at the point sources generating the chemicals and emissions exposures experienced by these workers. The noise on the handheld equipment is also a problem and contributes to significant hearing loss for those operating these machines. This approach to incentivize changed behavior is also timely and would be well embraced by the many communities currently looking to regulate noisy outdoor equipment. Cutting down on the noise also reduces stress levels of users and others exposed to it, such as children near outdoor fields and playgrounds where the equipment is in use.

Chapter 2 of the CECP discusses the path to get to net zero by 2050. The plan notes that “for the Commonwealth to achieve Net Zero, fossil fuel use must be all but completely eliminated in on-road vehicles by 2050.” In order to facilitate widespread acceptance of EVs and ZEVs, charging station availability must be pursued by the Administration. Strategy T-4 in the Plan has some excellent recommendations, but I believe some additional ideas could be incorporated to great effect. When the new Stretch Energy Building Code is developed, new construction must be required to incorporate chargers in garages and communities must be encouraged to adopt zoning that requires numerous plug-in stations throughout commercial locations. Toward that end, it will be important to prevent communities from zoning against charging stations, which some believe are unsightly. The City of Boston recently passed home rule legislation preventing condominium associations from prohibiting owners from installing charging stations in visible locations. Modeled after the Boston language that was already adopted, I filed HD.1154, which creates a statewide law prohibiting condominium associations from unreasonably regulating charging stations and also prevents Historic Districts and Neighborhood Conservation Districts from prohibiting the installation of charging stations. Finally, I believe the EOEEA should work with the MPOs and RPAs to map out strategic locations and quantities of needed fast chargers to ensure equitable and sufficient distribution of stations across the Commonwealth. In some low-density rural areas, there may be fewer market-rate incentives to install chargers, but they will still, nonetheless, be needed. Moreover, during peak demand when our highways are already clogged, it could significantly set back widespread EV adoption if folks are stranded at highway rest stops queuing for chargers. This must be managed carefully with a data-driven approach.

I thank you again for the opportunity to comment on this excellent plan. I hope my suggestions will be of use to you as the Commonwealth moves forward to implement the strategies laid out. Should any of my comments need further elaboration, I would be happy to provide more input.

Sincerely,

A handwritten signature in black ink that reads "Michelle Ciccolo". The signature is written in a cursive, flowing style.

Michelle Ciccolo  
State Representative  
15<sup>th</sup> Middlesex District

Attn: Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

March 22, 2021

Dear Secretary Theoharides,

Founded in 1900, the Society of American Foresters (SAF) is the Nation's foremost professional organization for practicing foresters. SAF is responsible for accrediting forestry programs at colleges and universities across the United States including the University of Massachusetts, Amherst. The Massachusetts Chapter represents 95 professional foresters who are engaged in stewarding 3.2 million acres of public and private forest land across the Commonwealth.

SAF members have a deep and enduring love for the land, and are inspired by the profession's historic traditions, such as Gifford Pinchot's utilitarianism and Aldo Leopold's ecological conscience. In our various roles as practitioners, teachers, researchers, advisers, and administrators, we seek to sustain and protect a variety of forest uses and attributes, such as aesthetic values, air and water quality, biodiversity, recreation, timber production, and wildlife habitat.

Working on the land everyday, we see firsthand the impacts climate change in forests and support continued leadership by the Commonwealth to address Climate Change. The Clean Energy and Climate Plan for 2030 (2030 CECP) is an important continuation of the work to improve the relationship between society and forests.

SAF members are governed by a code of professional ethics and it is our goal under this guidance that we seek to provide information to you, Secretary Theoharides, and staff at the Massachusetts Executive Office of Energy and Environmental Affairs to improve the 2030 CECP for the benefit of the public, forests, and the climate.

**Principle No. 4 from the SAF Code of Ethics**

*Public policy related to forests must be based on both scientific principles and societal values. We pledge to use our knowledge and skills to help formulate sound forest policies and laws; to challenge and correct untrue statements about forestry; and to foster dialogue among foresters, other professionals, landowners, and the public regarding forest policies.<sup>1</sup>*

**Support for a holistic Science-Based approach to achieve climate goals.**

SAF promotes and supports science-based policies and actions that consistently recognize the positive role that forest management plays in: (1) mitigating greenhouse gas (GHG) emissions through the sequestration of atmospheric carbon in resilient, well-managed forests (trees and soil), producing wood-based products to replace both non-renewable materials and fossil fuel-based energy sources; and (2) adapting to future climate patterns through active forest management that reduces the risk of stand-replacing wildfire and other climate-driven disturbance emissions and avoids land-use changes from forests.

Successfully adapting our forests and forest management practices to climate change will require explicit and long-term investments in research, education and outreach to aid in management for these changes. This includes direct monetary support to private landowners and public agencies to explore and implement the technologies and practices that can be used to mitigate carbon emissions and adapt to changing climate conditions, and associated assistance programs for local communities to implement the necessary changes.<sup>2</sup>

**Honor the public review process in a democratic society.**

Much of the interim 2030 CECP references data and strategies developed in the 80x50 Roadmap study<sup>3</sup> commissioned by EOEEA. SAF members are deeply troubled by the decision not to undergo a public comment process for the study report. While the report as published has been useful for the development of these comments, it would have greatly improved the 2030 CECP to have had public input on the 80x50 Roadmap study prior to this comment period.

**Improve Coordination within EOEEA and with federal partners.**

SAF members strongly believe that the 2030 CECP should align and enhance the goals and objectives of the 2020 State Forest Action Plan<sup>4</sup> and the 2015 State Wildlife Action Plan<sup>5</sup>. Both the 2020 SFAP and 2015 SWAP inform forest policy in the Commonwealth based on the best science available. These documents are required for leveraging federal funding to support forest conservation in Massachusetts.



**Provide fair opportunities for accelerated renewable thermal development utilizing forest products.**

Forest managers are reliant on the balanced consumption of low-grade and high-grade wood products to fund work that achieves the Commonwealth's goal of increasing forest resiliency under a changing climate.<sup>4</sup> While efforts to increase the usage of long lived wood products (2030 CECP Strategy Action L3) are important, providing these products in a sustainable manner requires buyers for poorly formed, suppressed, and diseased trees which compete for resources in the forest.

The 2030 CECP as drafted lacks substantive goals for continuing to utilize wood heating as part of the solution to achieve a 45% reduction in GHG emissions by 2030. This is a significant deviation from policies set in the 2015 update to the 2020 CECP<sup>6</sup>. It also conflicts with the guiding principles for climate policy development and implementation recommended by the GWSA IAC.<sup>7</sup>

As stated multiple times in the interim report of the 2030 CECP a **“critical opportunity for action to convert fossil fueled HVAC equipment with long lifespans is at the point of replacement.”** While electrification and envelope efficiency may in the future serve “60%-95%” of all buildings in the Commonwealth, there are still **5-40% of buildings which would be underserved by proposed building sector strategies.**

Wood energy has an important role to play in meeting GHG reductions for this underserved demographic and is an important tool for addressing socio-economic equity in rural communities. EPA certified wood energy appliances are readily available to consumers today and there is an existing regulatory framework to ensure a reliable supply of wood fuel fits within a sustainable threshold of harvesting.<sup>8</sup>

All renewable technologies face challenges to achieve a widespread adoption necessary to address climate change. The last five years of operating the renewable thermal incentive program by MassCEC and the APS program by DOER have shown that both the direct incentives and AECs are necessary to ensure that the Commonwealth has the best possible chance to help consumers act at time of system replacement. Massachusetts climate policies should significantly support the continued development of wood energy for the dual benefit of forest managers working to create resilient landscapes and consumers looking to replace fossil fuel use.

**Comments on interim 2030 CECP Strategies**

**B2 Strategy Actions:**

- DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in EJ communities through targeted community-based incentives and outreach programs, and increased funding for pre- weatherization barriers.

Firewood is an important tool to address energy insecurity and build climate hazard resiliency in rural EJ communities. In alignment with the 2020 Massachusetts Forest Action Plan strategies 20 and 37<sup>4</sup>, DOER should include support for the expansion of wood banks and restore MassCEC funding for the Commonwealth Wood Stove Change Out Program.

- EEA and DOER will seek near-term means to enhance MassCEC funding to support continued market development for building decarbonization.

As stated above, SAF agrees with the finding that a critical opportunity for action to convert fossil fueled HVAC equipment is at the point of replacement. MassCEC incentives for wood energy systems should be restored to aid building decarbonization. This will send a clear message to wood energy market participants which will spur the additional private investment necessary to build a competitive market for benefit of Massachusetts consumers.

- MassCEC will refine and enhance workforce development programs related to building decarbonization and will investigate the need for air- source heat pump certification and workforce training.

Additional workforce development work is necessary to expand locally grown and manufactured wood energy to achieve maximum utility for building decarbonization. As a part of MassCEC's efforts to refine and enhance workforce development a Businesses Retention and Expansion (BRE) program should be developed for the wood energy sector.

**B3 Strategy Actions:**

- The Baker-Polito Administration will convene a Commission and Task Force on Clean Heat by May 2021.

The Commission and Task Force on Clean Heat should include members of the wood energy sector including representatives of wood fuel and appliance businesses as well as a state government expert on forest products markets.

***E4 Strategy Actions:***

- EEA and DOER will lead planning for ground-mounted solar development to ensure best land management practices that protect critical Massachusetts species and ecosystems, while MassCEC works to identify market mechanisms to incentivize alternative siting.

SAF members are concerned that the additional 60,000 acres of land needed to supply solar energy will have an adverse effect on forests and forest product markets in Massachusetts. Forest land is one of the most cost-effective sites for solar installations and this should be a cause for concern at EOEEA. We support the recent changes to 225 CMR 20.00 Guideline Regarding Land Use, Siting, and Project Segmentation.<sup>9</sup> This change protects ecologically important forest lands from solar development. Additional analysis is needed to understand what the impact of continued solar development will have on forest products markets. This is especially important for already constrained low-grade markets as large quantities of forest products subsidized by solar development revenue have the ability to disrupt essential markets for landowners who are working to create climate resilient forests.

***L3 Strategy Actions:***

- EEA will continue exploring opportunities to incentivize the regional use of harvested wood in long-lived products, such as cross laminated timber and wood-based building insulation.

SAF members are excited by recent technological developments in wood construction which enable tall buildings to be made out of wood. We fully support continued development of this sector and the wood insulation market. Both of these proposed actions do carry significant financial risk due to a globally competitive marketplace and the complexity of Massachusetts forests. In the region, more homogenous forests in Maine, Northeastern New Hampshire, Quebec, and New Brunswick have existing infrastructure for commodity lumber which is well suited towards the development of these new markets.

It is our recommendation that the L3 Strategy Action should be broadened to include development of existing and new local wood manufacturing in the region. Local sawmills are important contributors to the Commonwealth's efforts to store carbon in long-lived wood products. The decentralized makeup of the existing manufacturing fleet is well suited to the diversity of tree species in Massachusetts. Many local mills have additional capacity that could be brought online quickly if the economic conditions are right.

***Proposed new language for L3 Strategy Actions:***

- EEA will continue exploring opportunities to incentivize the regional use of harvested wood in long-lived products, such as native lumber, solid wood furniture, cross laminated timber and wood-based building insulation.

***L4 Strategy Actions:***

- EEA will continue working with states and stakeholders across the Northeast to develop the measurement, accounting, and market frameworks necessary to support development of a regional carbon sequestration offset market by the end of 2025.

It is our recommendation that EOEEA should utilize forest carbon data compiled by the U.S. Forest Service Forest Inventory and Analysis Program.<sup>10</sup> FIA is a nationally recognized dataset that already counts forest carbon sequestration and provides open access, standardized methodologies, and support staff funded by the people of the United States.

- EEA will convene an inter-agency Carbon Sequestration Task Force beginning in 2021.

It is our recommendation that the Carbon Sequestration Task Force should include external forest stakeholders including the Society of American Foresters.

**Editorial comments**

In Chapter 6 (p. 48) the following excerpt from the interim CECP does not foster an inclusive environment for the forest conservation community and undermines the "holistic approach" for policy development.<sup>7</sup>

The forests of Massachusetts are not regrowing into resilient lands that will sequester the Commonwealths GHG emissions by way of “benign neglect.”<sup>11</sup> Decades of past work by taxpayers, farmers, private landowners, loggers, and foresters provide the people of Massachusetts with the forests we have today. We all should be grateful and respectful for the tremendous work, time, and expense to recover a deforested landscape. Language pertaining to forest succession in Massachusetts should acknowledge this effort.

**Existing Language:**

Like many temperate forests throughout the world,<sup>53</sup> those in Massachusetts are regrowing following regional farm abandonment and reforestation in the nineteenth and early twentieth centuries and subsequent impacts of the 1938 hurricane and logging in the last century.

**Proposed Language:**

Like many temperate forests throughout the world,<sup>53</sup> those in Massachusetts are regrowing due to natural regeneration and forest conservation practices following a land use history of regional farm abandonment in the late nineteenth century and subsequent impacts of the 1938 hurricane, extractive logging, and changing agricultural markets.

Thank you for your consideration of comments provided by SAF members.

Respectfully

Ross Hubacz

Massachusetts Society of American Foresters, Chair

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## **Comment on Clean Energy and Climate Plan for 2030 (2030 CECP)**

From: Kimberly French  
24 Murdock Street  
Middleborough, MA 02346  
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I live in Middleborough, an environmental justice community. My concern is about the **difficulty of low/moderate-income residents to access meaningful incentives** for weatherization, retrofitting, and strategic electrification.

MassSave benefits primarily white, affluent residents, and I know that's true of our municipal utility's far more limited energy efficiency program. The people who get the incentives are mostly those who have the time, motivation, knowledge, and additional financial resources to undertake large projects to weatherize; electrify their heating, appliances, and cars; and install renewable technology. That needs to change. To fund large-scale weatherization for low-income people, we need a **climate bank or large state-wide financing program**—ideally one that can stay with the meter and not be dependent on credit rating. Fossil fuel incentives need to be eliminated entirely.

We need **workforce training** for employees displaced in the transition away from natural gas and other fossil fuels, as well as unemployed and underemployed workers in our economy. And we need training for architects, builders, tradespeople and building inspectors to install and operate electrified buildings.

Massachusetts does a poor job of measuring methane leaks from natural gas pipelines. There is more in the air than what the state measures. This plan needs a **more comprehensive and equitable methane/natural gas transition plan** than what is described here.

The **2030 goal to reduce emissions by 45% over 1990 is much too low**. The United Nations Intergovernmental Panel on Climate Change says we must achieve 50% to avert the worst climate catastrophes. A state like Massachusetts, with its political will and resources, needs to step up and do even more. The first 20% emissions reduction requires far less effort than the last. We need more rapid reduction immediately. The big opportunity is to be more aggressive with our building energy use. To get to a 2050 goal of either net zero or 100% renewables, we need to fund low-income households to transition to new technologies first.

Secretary Kathleen Theoharides,  
Executive Office of Energy & Environmental Affairs (EEA)  
100 Cambridge Street, Suite 900  
Boston MA 02114

March 22, 2021

**Re: Draft Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides,

We, the undersigned residents of the Boston Metropolitan area are actively involved in community affairs in our neighborhoods. Our activities include programs to provide information on developments in the sources of energy and the management of energy demand, as well as alternative HVAC systems and sources of funding for building renovations and upgrades and reviewing projects in existing and new buildings with emphasis on their sustainability and resiliency in the face of Climate Change.

We are very concerned about the extent and possible duration of the role of fossil (“natural”) gas as a source of energy in the Commonwealth. If this role is not substantially reduced in the foreseeable future, the continued burning of this fracked gas will make it impossible for the Commonwealth or the City of Boston to achieve the goals embodied in the next-generation roadmap for Massachusetts Climate Policy which is expected to be enacted in the very near future.

We therefore fully endorse and support the comments and recommendations submitted by the Acadia Center on March 22nd, 2021 concerning the Draft Clean Energy & Climate Plan 2030. These seven recommendations are in summary:

1. *Massachusetts needs a cross-sector infrastructure plan;*
2. *The EEA should retain its own **independent** gas planning consultant;*
3. *Electrification is the way to achieve real, verifiable emissions reductions since use of alternative fuels for this purpose is unrealistic and expensive;*
4. *More accurate ways of accounting for methane leakage are warranted;*
5. *The 2022-2024 plan must be designed with a fossil gas phase-out in mind;*
6. *The Commonwealth must consider fossil “natural” gas’ health impacts;*
7. *Failure to plan will disproportionately harm environmental justice (low-income and other marginalized) communities.*

Thank you for your attention,

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March 21, 2021

Dear Members of the EEA,

Our Climate Massachusetts, a proud member of the Massachusetts Youth Climate Coalition, supports the enactment of the 2030 Interim Clean Energy and Climate Plan. The CECP is an essential step forward in making MA the leader we need on climate justice. The next 10 years will be the most critical period for combating climate change, so there is no time to waste.

This plan also does not go far enough. The next draft must:

- Raise the 2030 Emissions Targets to at least 50% reductions
- Set specific, measurable, time-bound goals in place of aspirational statements, especially where it pertains to Environmental Justice communities
- Refine how to make sources of funding like TCI equitable by grounding its design in the work of the Green Future Now campaign

The 45% emissions reductions goal of the 2030 CECP is not aggressive enough given the capabilities of Massachusetts and the overall goal of net-zero emissions by 2050. As the first 10 years of implementation are the most crucial in mitigating the harmful effects of greenhouse gas emissions, the 2030 CECP should be doing the heavy lifting. Massachusetts coast lines are rising, extreme weather events are increasing in frequency, and the weather is less predictable each year. We must fight hard today, so that we can continue to fight at all in the future.

Further, the 2030 CECP is not wholly transparent with its intended sources of funding—TCI is not where it needs to be yet. Though the TCI process has attempted to engage EJ leaders in its decision-making, the current MOU is problematically vague, and we are concerned by the central role it plays in raising funds. As part of the Green Future Now Campaign, Our Climate has been running 1-on-1 conversations with our EJ partners, many of whom are on the TCI equity table and are much more confident in the framework provided by HD.1972 that we have filed with Rep. Bill Driscoll. This bill lays out a framework for ensuring that low-income people are financially protected and that 60% of funds are allocated to EJ Communities, while giving those same communities decision-making power to shape how it is spent. Anything less precise than this has the potential to repeat RGGI's equity mistakes.

We look forward to meeting with the office soon to further discuss these ideas and build a relationship between the administration and the Massachusetts Youth Climate Coalition. Look out for emails from us soon or reach out directly to Ian Galinson: [galinson@bu.edu](mailto:galinson@bu.edu).

Sincerely, Our Climate



Liberty  
36 Fifth Street  
Fall River, MA 02721

March 22, 2021

Secretary Kathleen A. Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St.  
Suite 900  
Boston, MA 02114

### Comments Regarding the Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides:

On behalf of Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty, a natural gas local distribution company (LDC) serving more than 55,000 customers in nine Southeast Massachusetts communities, including the City of Fall River and nearby towns, thank you for this opportunity to offer comments on the *Interim Clean Energy and Climate Plan for 2030* (*Interim CECP*). Consistent with the passage of the Global Warming Solutions Act ("GWSA") in 2008, the *Interim CECP* is an important step in the Baker Administration's efforts to put Massachusetts on a path to achieve net-zero greenhouse gas emissions by 2050, and represents years of hard work and commitment on the part of many dedicated public servants and stakeholders. This *Interim CECP*, and the research and analysis which informed it, provide a rigorous, nuanced, and evidence-based start to the decarbonization discussions being undertaken in the Commonwealth today.

We all know achieving the Commonwealth's emission reduction goals won't be easy, and Liberty appreciates that the *Interim CECP* acknowledges there is much work yet to be done, especially when it comes to designing equitable, affordable, and effective strategies for decarbonizing the building sector. To that end, Liberty is committed to partnering with the Commonwealth and the communities we serve to assist in the development and deployment of such strategies. Our comments below focus on what we find the *Interim CECP* gets right about building sector decarbonization in particular, and how Liberty envisions building on these strategies and policies to support and enable the Commonwealth's objectives. We look forward to continuing to collaborate with you on this vital effort.

As part of the Algonquin Power & Utilities Corp. family, sustainability is a central pillar of Liberty's business strategies and is woven throughout every aspect of our operations. We are proud to have been recognized as a global leader in sustainability in the 2020 Corporate Knights Global



Top 100 Most Sustainable Corporations in the World ranking, and to be one of the 325 companies recognized by the 2020 Bloomberg Gender-Equality Index for fostering an inclusive and equitable workplace. On that basis, we offer our these comments, further detailed below, with respect to the *Interim CECP's* initiatives associated with, and Liberty's commitment as a business to, decarbonizing the building sector, deploying renewable energy resources in an equitable and affordable way, and maintaining a safe and reliable distribution system for our customers.

We find that the unique character of the communities we serve gives Liberty particular insight into the customer-facing challenges of decarbonizing the building sector. For example, one-in-five of Liberty's Massachusetts customers qualify as "low income," and two-thirds of Fall River residents live in Environmental Justice block groups. Older buildings and multifamily housing are prevalent. For example, in Fall River only 26% of housing units are single family homes, compared to 76% statewide. As a result, many families don't themselves control the investment decisions around the energy systems which heat their homes. Consequently, Liberty shares the "particular concern" stated in the *Interim CECP* that low-income families who currently heat their homes with natural gas may experience "financial hardship" if required to transition to electric heat, or could be left behind in the transition to a net-zero energy future. That concern extends further to the significant moderate-income population in our service territory as well, where median incomes are 35% lower than the statewide average.

The communities we serve, particularly Fall River, are emblematic of the need for a balanced portfolio of building sector decarbonization policies, in order to avoid forcing the most vulnerable citizens to continue bearing a disproportionate share of the costs and externalities associated with the energy system. At present we work closely with our local CAP agencies to ensure the services Liberty provides are tailored to the unique needs of the communities we serve, and we strongly believe such partnerships must continue and expand as the transition to a decarbonized economy continues.

The *Interim CECP* is correct that "there is not a one-size-fits-all solution" for decarbonizing the Commonwealth's building sector. We further agree that considering "innovative utility business models to affordably deploy clean heating systems and deep energy retrofits" and the "potential for sustainable and cost-effective market deployment of biofuels, renewable natural gas, and hydrogen for space heating" will be essential to designing and implementing policies to equitably achieve the deepest and broadest decarbonization outcomes, especially for families and businesses in vulnerable or previously marginalized communities.





What, then, is the best pathway for achieving equitable decarbonization of Massachusetts' building sector? The *Interim CECP* admirably captures the complexity and nuance of this crucial question. Increasing building energy efficiency should be part of any comprehensive decarbonization solution, and while the broad deployment of efficient electric heating equipment is certainly an important piece of the building heat decarbonization puzzle, it is also clear, as the *2050 Decarbonization Roadmap* states, that "a variety of decarbonization strategies is preferable" to "electrifying everything."

This is entirely consistent with the actions currently being undertaken by the LDCs at the behest of the Department of Public Utilities in its ongoing docket, D.P.U. 20-80. As EEA is well aware, this docket is in its nascent stages, but the LDCs, including Liberty, are actively engaged with interested and diverse stakeholders such as the Office of the Attorney General, EEA and the Department of Energy Resources, and local communities and interest groups in furthering the purposes and objectives of this docket. In initiating D.P.U. 20-80, the Department indicated that it will explore strategies to enable the Commonwealth to move into its net-zero greenhouse gas emissions energy future, while simultaneously safeguarding ratepayer interests and ensuring safe, reliable, and cost-effective natural gas service, all of which we find to be of paramount importance. We very much look forward to exploring the future role of the LDCs as part of the D.P.U. 20-80 process.

Consistent with the findings of the *Interim CECP*, the *Roadmap*, and the technical reports, Liberty envisions a future in which gas LDCs play a vital role in partnership with the Commonwealth to achieve deep decarbonization equitably, affordably, and effectively. The LDCs are uniquely positioned to assist in this transformation, and should contribute to a decarbonized future by helping customers become more energy efficient through building retrofits, advanced energy efficiency technologies, geothermal and district heating, and other strategies to reduce demand; continuing to reduce and eliminate methane emissions from gas networks; and by supplying customers with low-, zero-, and negative-carbon sources of energy, such as renewable natural gas (RNG) from local and regional feedstock, and clean hydrogen. Liberty stands ready and able to engage in these types of transformative initiatives now. In fact, Liberty will be filing with the D.P.U. this spring to propose an RNG initiative that will allow residential, commercial, and industrial customers to take advantage of locally produced renewable fuel.

Utilizing these strategies to decarbonize the gas system will not only enable the deepest and fastest pathway to economy-wide decarbonization. Doing so will also help mitigate the risk contemplated in the *Roadmap* that "those least able to afford converting to a heat pump could be left responsible for increasing energy and infrastructure costs," by enabling many gas



customers to continue using existing heating equipment and distribution networks – only more efficiently, and with decarbonized fuel – ensuring costs are not concentrated on those who are least able to afford it.

In addition to enhancing the equitability and affordability of the transition to a decarbonized economy, realizing this vision for the role of gas systems in a decarbonized future will:

- Leverage the significant investment Massachusetts gas customers have already made in the gas distribution system, by putting that valuable infrastructure to work delivering decarbonized, 2050-compliant fuel to keep families and businesses warm.
- Balance efforts to maximize environmental benefits through each LDC's respective Gas System Enhancement Plan (GSEP), subject to the ongoing commitment to provide safe and reliable service to customers.
- Through the maximization of the GSEP, provide jobs to the community, enhance the integrity of the distribution system to allow it to serve as the pathway to diversifying and providing clean fuel resources as they become more available and cost-effective for customers.
- Reduce hard-to-abate emissions from waste streams by turning waste into clean fuel (i.e., RNG).
- Boost renewable energy penetration and support diversification of energy storage by creating new markets for curtailed clean power production, including offshore wind (e.g., hydrogen electrolysis and hydrogen blending).
- Help ensure the availability of low-carbon fuels for industries which rely on high-temperature process heat which is not easily electrified, and for other sectors.
- Enhance the overall reliability and resilience of the energy system and reduce the cost to customers of electric system enhancements compared to an approach relying exclusively on electricity.

Liberty applauds the *Interim CECPs* recognition of the important role decarbonized fuel blending can play in the transition to low-carbon building sector, and we are eager to take steps to decarbonize our own section of the natural gas system in the near term. We find the *Interim CECPs* example of reducing the carbon intensity of the natural gas system by 5 percent by 2030 to be an achievable goal that will spur even deeper decarbonization of gas systems into the future. But in order for that to come to fruition, the LDCs will need to be able to participate in that deployment as partners, as keepers of the safe and reliable distribution system, and as companies committed to meeting the unique needs of their customers and the unique challenges of their service territories.



Moreover, we are encouraged to find that the *2050 Decarbonization Roadmap* as well as the *Energy Pathways to Deep Decarbonization* report and the *Building Sector Report* which accompany it make clear that more work must be done to fully understand the potential of gas distribution system decarbonization. Recognizing that the *2050 Decarbonization Roadmap* states “gas use continues in some quantity across all Net Zero pathways, including for space heating” out to 2050, it makes good sense that the *Interim CECP* recommends “convening a special Commission on Clean Heat” to propose new statutory, regulatory, and financing mechanisms to deploy reliable and affordable clean heat solutions. We look forward to participating in these proceedings, and to fully exploring the future role of the LDCs through the D.P.U. 20-80 process.

Thank you for the bold strides EEA has taken in the *Interim CECP*, and for the opportunity for Liberty and the natural gas industry to join with you in moving Massachusetts energy policy forward. EEA’s vision and actions emphasize the imperative for an equitable, achievable, and affordable transition to a decarbonized economy. Liberty shares these priorities, and is committed to advancing innovative technologies and business models to bring our shared objectives to fruition.

Sincerely,

/s/ Peter Eichler

Peter Eichler  
President  
Liberty-MA



March 18, 2021

Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Re: REQUEST FOR COMMENT ON CLEAN ENERGY AND CLIMATE PLAN FOR 2030

Dear Secretary Theoharides:

The Berkshire Regional Planning Commission (BRPC) is pleased to submit comments on the Clean Energy and Climate Plan for 2030 presented by The Executive Office of Energy and Environmental Affairs (EEA). BRPC appreciates the efforts of EOEAA to establish aggressive GHG reduction goals and provide a pathway to achieve them that prioritizes equity and affordability. Berkshire County is more rural than much of the state and relies on its abundance of natural resources to support a tourism-based economy. Therefore, our utmost priority is to achieve our region's share of GHG emissions reductions while preserving its natural beauty to remain a recreational destination and preserve quality of life for residents. With that as our guiding principle, BRPC offers the following comments on the strategies outlined in the CECP:

## **Chapter 2. Transforming Our Transportation Systems**

### *Chapter 2. General Comment*

The reduction of the Commonwealth's total GHG emissions by 45% from the transportation sector is extremely ambitious and it is expected that the majority of these emission reductions will come from electrifying light duty vehicles. Based on the information presented, medium and heavy-duty vehicles receive less focus for a variety of reasons and this raises equity concerns. Furthermore, at a time when the State legislature is pushing for greater emissions reductions, every vehicle classification/type should be considered as candidates for clean vehicle technology. Vehicle manufacturers have a reputation for delaying the delivery of clean vehicle technology for medium and heavy-duty vehicles even when required by federal legislation. By allowing exceptions and additional time for vehicle manufacturers to bring clean vehicles to the marketplace, it will guarantee that emission reduction targets will not be met.

The document indicates that the availability of light duty vehicles will increase along with a greater variety of types including pick-up trucks. It is stated that vehicle charge range will continue to increase and that the vehicle market has brought down the costs of EVs. Although battery technology has assisted with efforts to increase vehicle range, the cost of a new vehicle is significant and new vehicle costs increase with each successive model year. Even if the economy continues to grow at a modest rate, personal wealth/salaries will also need to increase in order for the light duty fleet electrification strategy to be successful. The strategy is filled with risk as it is highly dependent on 750,000 to 1 million all electric vehicles being deployed into the State's light duty fleet over the coming decade. We do not believe that the majority of Berkshire County residents will be able to afford new electric vehicles in the timeframe called for by this plan. We previously have shared this concern. Attached to this correspondence is a copy of BRPC's comment letter on the TCI initiative

which provides more details on this as well as other rural area concerns related to GHG emission reductions from the transportation sector.

One item that is noticeably missing from the discussion are the anticipated costs. All of the strategy actions will have a cost and this cost will be borne by residents and ratepayers. As transportation costs increase for businesses, these costs will be passed on to the consumer. There is no discussion on the impact that this will have. Developing policy without a full understanding of the financial impacts is troubling and can lead to unintended consequences such as program abandonment or emission reduction goals not being attained.

Many of the strategies and actions within this section as well as the rest of the plan are overarching and involve numerous state agencies. More involvement by additional state agencies should occur. With respect to transportation, MassDOT can take a more active role in this effort along with EEA and MassDEP.

The following section outlines our comments on the strategies and policies for the transportation section of the *Clean Energy & Climate Plan for 2030* (Chapter 2). The format restates the strategy and summarizes the information that is provided. It concludes with a discussion of concerns, issues and level of support for the strategy and strategy actions.

#### *Chapter 2. Strategy T1*

This strategy directly relates to Transportation and Climate Initiative Program to reduce emissions from the transportation sector. T1 Strategy Actions include signing on to the TCI program with implementation in 2023 and then development of a regional low carbon fuel standard (LCFS) with implementation no later than 2036.

The LCFS effort is essentially a requirement for bio diesel fuel. Bio diesel fuel has been used successfully by fleets in numerous regions across the country and it continues to be utilized by fleets. No reason or justification is given for waiting until 2036 for its implementation and BRPC encourages moving up this implementation date. Previously, BRPC submitted comments on the TCI initiative outlining disparate impacts to rural areas. BRPC is using this opportunity to again draw attention to our concerns.

A copy of our letter outlining our concerns is attached.

#### *Chapter 2. Strategy T2*

Included in this strategy is the adoption of California standards for light duty vehicles and the requirement that 100% of all new light duty vehicles sold in Massachusetts in 2035 be Zero Emission Vehicles (ZEV). Also, MassDEP will be required to adopt and implement ZEV purchase mandate for Advance Clean Truck and Fleets rule by December 2021. MassDEP will work with 16 other states on an action plan for achieving 30% of all new truck and bus sales being ZEV by 2030 and 100% by 2050.

The T2 strategy actions are very ambitious. There is no way to determine if the vehicle manufacturers will be able to deliver the quantity and types of vehicles that are called for by 2035 and 2050. In 2020, only 375,000 plug-in electric vehicles were sold to US consumers. Even with the provisions of federal legislation and the Clean Air Act, automakers have been able to gain reprieve from similar requirements in the past. Historically, medium and heavy-duty vehicles have escaped

lower or ZEV emission requirements. The low requirement that 30% of all new trucks and buses sold in 2030 be ZEV further exacerbates an inequity as all light duty vehicles sold in 2035 must be ZEV. The mandates related to medium and heavy-duty vehicles should be accelerated. Finally, MassDEP should seek assistance from MassDOT to work with all regional transit agencies to begin acquiring ZEV buses now and not wait until 2030.

### *Chapter 2. Strategy T3*

This strategy is directly focused on reducing the cost of ZEV purchases. The Commonwealth has established an incentive program (MOR-EV Program) that currently provides \$2,500 rebate for the purchase/lease of a new BEV (battery electric vehicle) or FCEV (fuel cell electric vehicle) and a \$1,500 for PHEV (plug in hybrid electric vehicle).

The Strategy Actions for T3 include exploration of providing MOR-EV rebates at point of sale, investigating the development of a low and moderate income consumer program for ZEVs, developing a heavy duty ZEV incentive program. These strategy actions appear to offer great potential in reducing up front purchase costs and increasing the number of EVs in operation. However, funding for this program is not from a dedicated source, and in 2019, rebates were temporarily halted until funding was extended. This strategy action does not specify the amount of funding that will be available which can negatively impact the success of this program. The Volkswagen Settlement Fund which totaled \$75M, is not a viable long- term source of funding for this strategy. TCI-P revenue also does not appear to be able to provide significant incentives and rebates. The report does make mention of the federal tax credit that serves as an incentive; however, some vehicle manufacturers have exhausted their allocation and therefore, this cost savings incentive has limited applicability in the future.

The low and moderate income consumer program and heavy duty ZEV incentive program appear to offer potential in reducing emissions; more information should have been provided on this strategy action. As Berkshire County income levels are well below the statewide average, BRPC strongly supports the concept for such a program which reduces or eliminates the financial hardship from acquiring a new, clean technology electric vehicle.

Consideration should also be given to increasing the rebate/incentive for ZEVs and removing the rebate for hybrid vehicles. Hybrid vehicles still use an internal combustion engine which produce GHG emissions and there is no way to limit these emissions. Larger incentives for ZEV purchases would help to accelerate purchases and assist with reducing the purchase cost burden.

### *Chapter 2. Strategy T4*

The intention is apparent, this strategy addresses electric vehicle charging infrastructure and related logistical matters including the preferred time period for vehicle charging.

T4 Strategy Actions include exploring a utility based residential charging incentive program, how to improve direct current fast charging (DCFC) financial viability through pilot programs and revised rate structures and exploring time varying rates and active demand response programs. We agree with the premise that the majority of charging should occur during off peak periods typically overnight at the vehicle owner's home. However, there are circumstances where this may not be possible and that charging will need to occur at alternate locations and times. Rates for charging vehicles at off peak times should be set at the lowest possible amount to serve as an incentive to acquire and use EVs. Absent from the Strategy Action is a requirement that utility providers play a

more active role to promote and construct EV supply equipment. In addition to requiring that they hire additional personnel specifically to promote EV use and infrastructure deployment, annual progress reports should be required to identify successes and future opportunities. BRPC is in full agreement with the rationale for smart charging and supports the outlined efforts.

#### *Chapter 2. Strategy T5*

This strategy is intended to inform consumers and fleet owners about the additional benefits of EVs along with providing education and technical assistance. Communicating this information can play an important role in gaining acceptance of clean vehicle technologies and further implementation efforts as there is an urgency to begin transitioning to the use of this new vehicle technology immediately.

Both EEA and MassCEC need to step up their efforts related to the Strategy Actions. This strategy is crucial, new staff should be hired to assist with Accelerating Clean Transportation Now (ACTNow) program efforts. Staff should be assigned to regions (Western Mass., Central Mass., Northeast Mass., Southeast Mass. and Boston metro) and they should also reside within their region. In doing so, it is more efficient, time is not wasted traveling from Boston to a region and this reduction in travel also reduces GHG emissions. These new staff members can also serve to coordinate and monitor the activities of the Eversource and National Grid in their efforts to establish EVSE. It is also noticeable that the Massachusetts Clean Cities Coalition, the state entity charged with promoting alternative clean technology vehicles, has been absent in this effort.

#### *Chapter 2. Strategy T6*

This strategy targets the expected, continued increase in VMT from light duty vehicles that will contribute to GHG emissions and encourages increasing the density of development.

The majority of VMT associated with light duty vehicles is directly attributed to commuting. The focus of the strategy actions is aimed at reducing single occupancy vehicle trips (from commuting) and encouraging/incentivizing Smart Growth policies. These actions are more applicable to urban areas and can be difficult to implement in rural areas. Furthermore, the lack of funding for transit, especially in rural areas, limits the ability to promote transit as an alternative mode of transportation to reduce VMT and GHG emissions. A Smart Growth policy package needs to recognize the unique differences of rural area and it is recommended that this policy be developed in conjunction with the State's Rural Policy Advisory Committee.

The description provided about the strategy action lacks details and specificity. As such, until more information is provided, BRPC cannot support this action as it has the potential to negatively impact rural areas.

### **Chapter 3. Transforming Our Buildings**

The following section outlines our comments on the strategies and policies for the building sector portion of the *Clean Energy & Climate Plan for 2030* (Chapter 3). The format restates the strategy and summarizes the information that is provided. It concludes with a discussion of concerns, issues and level of support for the strategy and strategy actions.

#### *Chapter 3. Strategy B1*

This strategy considers the life cycle of buildings and their appliances and proposes measures to steer

new construction and appliances away from fossil fuel dependence through a phased approach by 2028.

While BRPC is in support of a high-performance stretch energy code as an important component for statewide decarbonization efforts, we would like to see this plan place greater emphasis on retrofitting older homes. Berkshire County has a high percentage of aging housing stock, and there is less new construction taking place in our region compared with much of the state. For example, Berkshire County experienced a -0.8% population change from 2018-2019, and authorized only 1.5% of the Commonwealth's building permits that year.

As this plan gets executed over the coming years, it will be important to recognize that the new energy code will be more impactful in certain regions across the Commonwealth and do little to realize meaningful GHG emissions reductions in others. We appreciate the acknowledgement that building envelope improvement retrofits of existing building stock must rapidly scale over the next several decades. We would like to see these types of improvements, as well as measures to eliminate clean energy adoption barriers, more heavily incentivized and costs reduced.

### *Chapter 3. Strategy B2*

This strategy outlines strategy actions to achieve widespread retrofits to enable electrification and envelope upgrades of 75% of existing building stock by 2050.

Deploying heat pumps and building envelope upgrades to the majority of residential buildings across the Commonwealth over the next 30 years is an ambitious target. Our region is already suffering from a dearth of tradespeople, a problem that exists across the Commonwealth and is expected to get worse in the coming years. This lack of contractors and related professionals is creating barriers for Berkshire County residents, especially those that are low-to-moderate income, to access the current Mass Save and related incentives.

Training and certification will not suffice to address this problem. Rather, systemic change needs to occur at the state level to address the regulatory barriers put in place that have over time de-incentivized people from entering the trades. Lengthy apprenticeship requirements with low wages, among other reasons, are deterring individuals from entering the trades. This not only raises costs for consumers but encourages unpermitted work. BRPC recommends that this plan include a regulatory review of these policies and that this review looks at the regulations of neighboring states that do not face this issue as precedents.

BRPC is also surprised to see no mention of the Property Assessed Clean Energy (PACE) program in the plan as a concrete way to cut GHG emissions in the commercial and industrial building sector. While we appreciate that the plan acknowledges emissions need to be drastically reduced in these building sectors, the plan lacks specific approaches to doing so. Commercial and industrial property owners need to be educated on this program and any barriers to accessing it should be investigated and addressed.

### *Chapter 3. Strategy B3*

This strategy discusses the first step in implementing the statutory, regulatory, and financing tools needed to promote the development of clean heating solutions for buildings, which will be the



formation of a clean heat task force. This strategy also details the priorities that this task force will assume.

BRPC is in support of the Administration's Commission and Task Force's consideration of zero up-front capital solutions for clean energy technologies for low income and affordable housing residents. However, we feel that this should be expanded for middle-income households as up-front costs may deter this population from adopting clean energy technologies as well.

## **Chapter 4. Transforming Our Energy Supply**

The following section outlines our comments on the strategies and policies for the energy supply section of the *Clean Energy & Climate Plan for 2030* (Chapter 4). The format restates the strategy and summarizes the information that is provided. It concludes with a discussion of concerns, issues and level of support for the strategy and strategy actions.

### *Chapter 4. Strategy E3*

This strategy includes methods to modify the Commonwealth's attribute markets so that they better correspond with one another and with activity in regional markets.

As part of DOER's 2022 review of current attribute markets, BRPC would like to see metrics and terminology used by each program standardized. Due to this lack of standardization, there is currently no easy way to compare programs. We ask that the final version of this plan address this issue.

### *Chapter 4. Strategy E4*

This strategy describes methods that various state agencies will pursue to facilitate widespread solar deployment throughout the state.

BRPC recognizes and supports that the deployment of solar generation as well as other clean energy resources will need to be rapid and widespread over the next several decades to meet 2050 energy demands. We appreciate this plan's acknowledgement that deploying a minimum of 40 GW of solar resources across 60,000+ acres of land conflicts with important land use goals such as protecting critical habitats and ecosystems, and the two endeavors must be carefully coordinated. BRPC has concerns that regions west of I-495, including Berkshire County, will be disproportionately tapped for solar and storage siting compared to the rest of the state due to the greater availability of undeveloped and/or less expensive land.

As mentioned throughout the CECP, forests play an important role in carbon sequestration and storage. Berkshire County is home to a high percentage of the pristine woodland that provides carbon storage for the Commonwealth. The Mohawk Woodland Trails Partnership is an ongoing Northwestern Massachusetts focused initiative that began in 2013 and is currently exploring carbon sequestration in the region as a viable revenue stream for municipal and private landowners. The environmental and economic benefits of our region's forested land for the Commonwealth should be recognized when siting solar across the state.

We believe that SMART regulations currently incentivize utilities to pursue solar development in the western part of the state. As mentioned in the beginning of this letter, given our tourism-based economy, environmental constraints, and desire to maintain quality of life standards, we are concerned this development will negatively impact the future of our region. From a resiliency standpoint, the State needs to pursue generation as close to where it's being used as possible. With the load centers primarily cited in the eastern part of the state, more local generation will help prevent grid failures as we've seen occur in other parts of the state and increase resiliency. For all these reasons, equitable siting across the Commonwealth must be pursued.

BRPC supports the prioritization of the built environment over natural landscapes for solar and storage siting. Our region has an overabundance of suburban parking lots, as does much of the state, that would be prime locations for solar. We also think that more needs to be done to enable solar siting on both residential and commercial buildings.

As previously mentioned, Berkshire County has a large amount of aging housing stock. A portion of this housing has suffered deferred maintenance and would require repairs and a range of barrier mitigation measures to become solar-ready. On top of zero upfront capital solutions, other types of incentives, including barrier mitigation and structural repairs, must be heavily incentivized to make solar a feasible option in these cases.

We would also like to see this plan explore incentives for larger commercial-scale rooftop solar arrays. If it is not already slated for inclusion, building codes moving forward should require large commercial structures to be built ready for large-scale arrays. Small-scale net metering development on smaller commercial properties as a way to increase grid resiliency will also become critically important, and so smaller-scale commercial solar adoption should be incentivized as well.

EEA and DOER should put pressure on the utilities immediately to upgrade their infrastructure. Ensuring that widespread solar deployment is coupled with affordable and practical connection to the utility grid will be an important step to realizing the Commonwealth's goal of widespread electrification as well as streamlining the process for the consumer.

BRPC has observed unintended consequences of solar becoming a protected use under Chapter 40A. While we believe that the solar permitting process needs to be streamlined, we think that regulatory control should be restored at the local level. With little ability to weed out detrimental solar projects or incentivize beneficial ones, some communities have been forced to restrict the development of solar.

#### *Chapter 4. Strategy E5*

This strategy establishes offshore wind as the most reliable and feasible path forward for development of the Commonwealth's wind industry.

BRPC supports the development of the Commonwealth's offshore wind industry and believes offshore is the best source for wind energy. Given our priority to preserve the natural and recreational resources of our region, our tourism-based economy, and quality of life for our residents, we think offshore wind is the most sustainable path forward.

We also support MassCEC's efforts to build local supply chains. MassCEC should investigate ways to more equitably distribute the economic benefits that will accompany the growth of this industry throughout the Commonwealth without pursuing onshore wind.

## **Chapter 5. Mitigating Other Sources of Emissions**

The following section outlines our comments on the strategies and policies for the other sources of emissions section of the *Clean Energy & Climate Plan for 2030* (Chapter 5). The format restates the strategy and summarizes the information that is provided. It concludes with a discussion of concerns, issues and level of support for the strategy and strategy actions.

### *Chapter 5. Strategy N2*

This strategy describes ways to reduce non-energy emissions through enforcement of best practices in the waste, wastewater, and agriculture sectors and stricter emissions standards for Municipal Waste Combustor rebuilds or renovations. This strategy presents a goal of 90% waste reduction by 2050 that was established in the Draft 2030 Solid Waste Master Plan, and mentions the diversion of certain materials from the waste stream as a method for achieving this reduction.

We appreciate the aggressive goal cited in this plan from the 2030 SWMP of reducing solid waste by 90% by 2050. However, this seems unrealistic without a major system overhaul. Waste management as it's currently handled is burdensome to local municipalities that lack the resources to deal with increases in solid waste and creates a disjointed approach. In light of international waste management issues that have yet to be solved, we feel that further State involvement is necessary to achieve the goal of 90% waste reduction over the next 30 years. Municipalities do not have capacity to address these issues at the local level.

While providing technical and financial assistance for municipalities as cited in the 2030 SWMP will certainly be beneficial, we don't believe it will be sufficient. State-run facilities should be considered to shift reliance away from commercial waste management which can be unreliable in both the short and long-term.

## **Chapter 6. Protecting our Natural and Working Lands**

The following section outlines our comments on the strategies and policies for the natural and working lands section of the *Clean Energy & Climate Plan for 2030* (Chapter 6). This section begins with a general comment that originated through the consideration of land use strategies outlined in this section but is applicable to the plan as a whole. Then, the format restates the strategy and summarizes the information that is provided. It concludes with a discussion of concerns, issues and level of support for the strategy and strategy actions.

### *Chapter 6. General Comment*

BRPC supports many of the land use and management strategies outlined in this chapter. However, we think it's critical that the State develop a comprehensive land use plan that involves all relevant State agencies instead of continuing to pursue these strategies piecemeal through disparate planning initiatives. Without a coordinated, interagency approach, the efficacy of the strategies not only in this chapter but throughout this plan will be stymied.

We think it's important to better acknowledge the interconnectedness of our built and natural systems and address the issues included in this plan accordingly. While it is important that communities maintain control at the local level, there is a need for a state-wide land use plan to give communities the tools to better enforce these important preservation and management goals. A Statewide Land Use Plan could be a guiding document that would provide a consistent framework to base other plans upon and avoid conflicts.

*Chapter 6. Strategy L1*

This strategy outlines various initiatives intended to conserve farmland, forests, and wetlands.

BRPC appreciates the dedication to protecting our natural and working lands and quality of the environment as a way of increasing resiliency to climate change. Current real estate development trends and market pressures are particularly concerning from a land conservation perspective. Our region in particular has been experiencing heightened development pressure from both Boston and New York.

Given these trends as well as the severity of the climate emergency, we believe that the goal of achieving "no net loss" of farmland by 2030 is not sufficient and without a more active tracking mechanism may not be achievable. To achieve "no net loss" or more aggressive forest and farmland conservation goals, this plan should develop tracking metrics to ensure these goals can actually be met.

These comments were prepared before the climate change legislation being prepared by the Massachusetts General Court was finalized. They only respond to the Clean Energy and Climate Plan for 2030 presented by the Executive Office of Energy and Environmental Affairs (EEA) for comment on December 30, 2020.

These comments were approved by the BRPC Commission at its meeting on March 18, 2021.

Sincerely,

A handwritten signature in blue ink, appearing to read "Thomas Matuszko".

Thomas Matuszko, AICP  
Executive Director



March 22, 2021

Executive Office of Energy and Environmental Affairs  
Commonwealth of Massachusetts  
100 Cambridge Street, Suite 900  
Boston, MA 02114

**RE: Clean Energy and Climate Plan for 2030**

To Whom It May Concern:

The Coalition for Renewable Natural Gas (RNG Coalition)<sup>1</sup> offers this letter regarding the Executive Office of Energy and Environmental Affairs' (EEA) ongoing development of the Commonwealth's Clean Energy and Climate Plan for 2030 (2030 Plan).<sup>2</sup> Our comments below broadly discuss the potential for renewable natural gas (RNG) to provide greenhouse gas (GHG) and other environmental benefits in Massachusetts, as well as addressing a number of specific climate strategy actions as outlined in the 2030 Plan.

**About the RNG Coalition and the RNG Industry**

The RNG Coalition is the trade association for the RNG industry in the United States and Canada. Our diverse membership is comprised of leading companies across the RNG supply chain including RNG producers, energy marketers, waste management and recycling companies, utilities, academic institutions, and others. Together we advocate for the sustainable development, deployment and utilization of RNG, so that present and future generations have access to domestic, renewable, clean fuel and energy in Massachusetts and across North America.

The RNG industry is nascent relative to other renewables industries but has shown extraordinary growth driven by policies designed to promote environmental and economic goals—including but not limited to clean air, improved waste management, increased job development, energy independence, and resource diversity. Most of the RNG projects developed since 2011 have been incentivized by transportation decarbonization programs, including the United States Environmental Protection Agency's (U.S. EPA) Renewable Fuel Standard Program and California, Oregon, and British Columbia's Low Carbon Fuel Standards (LCFS). RNG is increasingly used to decarbonize natural gas end-use applications in stationary sectors, marked by the emergence of new policies such as Oregon's recently adopted RNG procurement program.<sup>3</sup> Today RNG production facilities are largely underwritten by the

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<sup>1</sup> For more information see: <http://www.rngcoalition.com/>

<sup>2</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>3</sup> See Oregon Public Utilities Commission's adoption of RNG procurement rules under [Oregon Senate Bill 98](https://apps.puc.state.or.us/orders/2020ords/20-227.pdf) here: <https://apps.puc.state.or.us/orders/2020ords/20-227.pdf>

monetization of tradeable credits, such as Renewable Identification Numbers (RINs) that RNG-sourced transportation fuel generates under the Renewable Fuel Standard.<sup>4</sup>

The vast majority of RNG available commercially today is created by capturing and processing raw biogas generated at sites with aggregated organic matter—such as landfills, wastewater treatment plants, and agricultural operations—and then upgrading this gas to meet pipeline quality standards. In the absence of the RNG project this biogas—consisting primarily of methane—is often flared, or worse, is uncollected and escapes fugitively into the atmosphere as a potent, short-lived climate pollutant.

In addition to the potential for GHG reduction through feedstock processing and fossil fuel displacement, RNG production facilities can provide other environmental benefits. For example, improving manure management practices at agricultural operations can benefit local water quality. The diversion of biogas from an on-site flare to produce pipeline-injected RNG also decreases local criteria pollutants which can affect nearby communities. The economic benefits realized with increased development, deployment, and utilization of RNG are also substantial—including millions of dollars in capital investment per project and creation of thousands of clean energy sector jobs.<sup>5</sup> In all cases, RNG production and utilization helps to create a circular economy, increasing the sustainability of organic waste processing systems.

### **The Role of Renewable Gas in Massachusetts**

RNG is an important near-term decarbonization strategy for applications which currently utilize fossil-derived natural gas and, in the long-term, will be necessary—in tandem with other renewable gases such as renewable hydrogen—for applications that have certain reliability requirements or which are not well-suited to electrification.<sup>6</sup> This concept is substantiated by studies commissioned for regulatory agencies in a number of jurisdictions—including New York<sup>7</sup> and California<sup>8</sup>—in which RNG is shown to be a necessary decarbonization strategy, even in high-electrification scenarios. Furthermore, it is important to understand that these high-electrification scenarios consistently show significant demand for natural gas remaining through 2050,<sup>9</sup> which should be decarbonized using renewable gaseous fuels wherever

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<sup>4</sup> RNG has grown substantially thanks to the RFS program, making up over 95% of the lowest-GHG-emission cellulosic biofuel production category and generation of D3 RINs (given for fuels that create at least a 60% reduction in lifecycle greenhouse gases). <https://www.epa.gov/renewable-fuel-standard-program/renewable-fuel-annual-standards>

<sup>5</sup> ICF, *Economic Impacts of Deploying Low NOx Trucks fueled by Renewable Natural Gas*, 2017 [https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/59077544ebbd1ad192d13ff6/1493660998766/ICF\\_RNG+Jobs+Study\\_FINAL+with+infographic.pdf](https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/59077544ebbd1ad192d13ff6/1493660998766/ICF_RNG+Jobs+Study_FINAL+with+infographic.pdf)

<sup>6</sup> Bataille et al., *A Review of Technology and Policy Deep Decarbonization Pathway Options for Making Energy-Intensive Industry Production Consistent with the Paris Agreement*. <https://www.sciencedirect.com/science/article/abs/pii/S0959652618307686>

<sup>7</sup> E3, *Pathways to Deep Decarbonization in New York State*. <https://climate.ny.gov/-/media/CLCPA/Files/2020-06-24-NYS-Decarbonization-Pathways-Report.pdf>

<sup>8</sup> E3, *Achieving Carbon Neutrality in California*. [https://ww2.arb.ca.gov/sites/default/files/2020-10/e3\\_cn\\_final\\_report\\_oct2020\\_0.pdf](https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf)

<sup>9</sup> For example, see pg. 35 of the California Energy Commission report entitled *The Challenge of Retail Gas in California's Low Carbon Future*, which finds that natural gas in California's residential, commercial, and industrial

possible pursuant to the goal of carbon neutrality. These concepts are further substantiated by, for example, the World Resources Institute, who recently published a paper illustrating how RNG fills a unique niche as part of a broader low-carbon technology portfolio.<sup>10</sup>

We believe that, generally speaking, these results can be extrapolated and applied to Massachusetts' energy landscape. Although the role of renewable gases is broadly defined by the large number of applications which currently utilize fossil-derived natural gas, these resources can be directed toward their highest and best use as demand for gas changes over time (based on increased electrification and other climate strategies).

Extensive capital stock exists in Massachusetts that is designed to transport and consume gaseous fuels, and which possesses a significant remaining useful life. Conventional natural gas is currently Massachusetts' largest single source of energy, accounting for 30.5% of total energy consumption in the state—including 28.8% of commercial sector use, 31.5% of industrial sector use, and 30% of residential use.<sup>11</sup> The Massachusetts 2050 Decarbonization Roadmap (2050 Roadmap),<sup>12</sup> as well as studies focused on gas sector decarbonization in other jurisdictions<sup>13</sup> show significant end-use demand for natural gas remaining through 2050, even in high-electrification scenarios. Accordingly, incentivizing low-carbon substitutes for the conventional fuels in these end uses is a natural near-term strategy.

ICF estimates that Massachusetts' potential to produce RNG from anaerobic digestion sources (landfills, animal manure, wastewater treatment, and food waste) is on the order of 7.2-11.824 tBtu/year.<sup>14</sup> This supply potential could satisfy 9% of residential demand, 10% of commercial demand, or 24% of industrial demand—and pipeline-connected RNG projects could be shifted between these demand categories over time if needed.

### **Feedback on Strategy Actions**

We appreciate EEA's attention to a number of strategies within the 2030 Plan which aim to support the use of renewable gases in various applications. We also appreciate that the 2030 Plan builds upon the 2050 Roadmap, which highlights the importance of bioenergy and renewable gases—including RNG and renewable hydrogen—as part of the Commonwealth's GHG reduction strategy. Indeed, this existing

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sectors is still ~1,000 tBtu in 2050 in the high-building-electrification case:

<https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/CEC-500-2019-055-F.pdf>

<sup>10</sup> World Resources Institute, *Renewable Natural Gas as a Climate Strategy: Guidance for State Policymakers*.

<https://www.wri.org/publication/renewable-natural-gas-guidance>

<sup>11</sup> EIA estimates Massachusetts' 2018 total energy consumption by type [here](#), 2018 commercial and industrial energy consumption [here](#), and 2018 total natural gas use by sector [here](#). Note that values are approximate due to variations between data sets.

<sup>12</sup> <https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download>

<sup>13</sup> For example, see pg. 35 of the California Energy Commission report entitled *The Challenge of Retail Gas in California's Low Carbon Future*, which finds that natural gas in California's residential, commercial, and industrial sectors is still ~1,000 tBtu in 2050 in the high-building-electrification case:

<https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/CEC-500-2019-055-F.pdf>

<sup>14</sup> American Gas Foundation, *Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment*, 2019

<https://gasfoundation.org/wp-content/uploads/2019/12/AGF-2019-RNG-Study-Full-Report-FINAL-12-18-19.pdf>

work illustrates how renewable gases can be used in the following strategies as identified in the 2030 Plan:

#### *Transportation – T1 – Low-Carbon Fuel Standard*

As part of strategy T1, the 2030 Plan includes the implementation of a low-carbon fuel standard as a key strategy, particularly in the medium-duty and heavy-duty vehicle (MDHDV) sector. We support EEA’s conclusion that Massachusetts’ MDHDV fleet must be decarbonized “with a greater variety of low- and zero-carbon fuels and on a pace sensitive to the specific performance requirements and comparatively small number of commercially-owned vehicles” and that “reducing the carbon-intensity of the fuels... will be the dominant strategy to offset emissions growth and drive emissions reductions in the next decade”. We also support a GHG reduction target of 20% by 2030 as a reasonable target for such a policy. If Massachusetts wants to maximize the use of RNG to help with decarbonization, a low-carbon fuel standard is one of the top two policies that EEA should seek to implement.

#### *Building Decarbonization – B3 – Decarbonized Fuel Blending*

RNG Coalition supports implementing policies which position RNG to help achieve a 20% reduction in building sector fuel use by 2030, including reducing the carbon intensity of natural gas supply by 5%. This should be viewed not only through the lens of building decarbonization but—with an eye toward RNG’s long-term applicability—as the foundational step in creating a supply of low-carbon fuels for all applications which run on natural gas and are not suitable for electrification. Massachusetts’ vast existing gas infrastructure currently serves all of these end-uses, therefore developing and connecting these resources now is a crucial step toward long-term decarbonization using both RNG and renewable hydrogen. Importantly, we agree with EEA’s conclusion that “[t]he diverse building stock in Massachusetts will require a range of options [for decarbonization]. There is not a one-size-fits-all solution, and not every building in Massachusetts can currently be cost-effectively electrified”.

Although still a relatively nascent industry, renewable hydrogen at scale could ultimately contribute greatly to decarbonization of thermal applications. Feedstocks used to produce biomethane today can be used to produce renewable hydrogen—a carbon-negative process when paired with carbon capture and sequestration.<sup>15</sup> With this in mind, EEA should ultimately expand their analysis to include bioenergy with carbon capture and sequestration. Furthermore, increased availability of electrolytic hydrogen could provide significant resource potential for zero-carbon renewable gas in thermal applications.

We look forward to the formation of a Commission and a Task Force on Clean Heat as envisioned by the 2030 Plan, which will be an important and appropriate forum in which to address the long-term questions regarding the long-term use of low-carbon fuels. As the 2030 Plan identifies, looking at the potential to create a sustainable, cost-effective market for RNG will be particularly important here. Along with the implementation of a low-carbon fuel standard, demand-side policies such as a renewable gas standard can be the largest drivers for RNG use. We look forward to the development of specific cap

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<sup>15</sup> LLNL, *Getting to Neutral: Options for Negative Carbon Emissions in California*, Baker et al., January, 2020, Lawrence Livermore National Laboratory (LLNL) [https://www-gs.llnl.gov/content/assets/docs/energy/Getting\\_to\\_Neutral.pdf](https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf)



levels and implementation approaches by the Commission and the Task Force on Clean Heat pursuant to the 2030 Plan.

### *Energy Supply – E1 – Clean Energy Resources*

As part of the 2030 Plan’s electricity generation strategy, EEA should support the use of biogas, RNG, and renewable hydrogen in all applicable electricity generation technologies. Based on their dispatchable nature, renewable gaseous fuels can provide reliable clean power in support of solar, wind, and battery systems which will contribute the lion’s share of renewable power in a carbon-neutral future. Providing the optionality for these resources to be used in the power sector will ensure the beneficial use of biogas and RNG where it may not currently make economic sense, even if we expect the need to use RNG in this sector to shift in the longer-term. The methods for processing various organic waste feedstocks will change over time—for example, as wastewater treatment plants may increasingly be used to process food waste—which could increase the viability for some facilities to create pipeline-injected RNG versus using raw biogas to generate electricity on site.

### *Non-Energy Emissions – N2 – Implementing Best Practices*

RNG and RNG-derived renewable hydrogen are truly circular resources which should be considered not only in terms of their potential to reduce GHG emissions in the end-use sector, but also through the lens of establishing next generation waste management practices which mitigate methane emissions. The 2030 Plan identifies industrial and non-energy GHG emissions as responsible for 5% and 8% of Massachusetts’ 2017 emissions, respectively. Waste emissions are a hard-to-abate sector and the underlying demographic drivers of these emissions likely will continue to grow, ultimately requiring the use of anaerobic digestion (AD) technologies and corresponding bioenergy production systems—alongside other strategies such as source reduction and composting—in order to sustainably manage Massachusetts’ organic waste. While the report specifically identifies the utilization of AD at wastewater treatment plants and municipal solid waste facilities as a way to reduce GHG emissions from both waste and energy sectors, RNG should also be viewed as a primary mitigation strategy for agricultural emissions. Furthermore, we recommend that EEA consider the variety of applications for AD, including where feedstocks can be co-processed. For example, food waste can be co-processed at wastewater treatment plants and agricultural digesters.

### *Foundational Policy Considerations*

Under programs such as a low-carbon fuel standard or renewable gas standard which aim to incentivize the use of RNG, GHG accounting using lifecycle analysis (LCA)—sometimes called carbon intensity (CI) when expressed on an emissions per unit energy basis—is a key tool to ensure the development of sustainable technologies. CI scoring should be a key consideration for the Commission on Clean Heat and the Task Force on Clean Heat as it pertains to establishing a sustainable market for RNG.

Full LCA has already been successfully included in multiple demand-side policies for transportation. Prominent examples include the California Low Carbon Fuel Standard and Oregon Clean Fuels Standard, which are largely<sup>16</sup> responsible for the current incentive structure governing project development and subsequent RNG utilization in North America. Oregon’s recently finalized renewable gas standard for gas

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<sup>16</sup> As layered atop the Federal Renewable Fuels Standard.

utilities—the first of its kind—also utilizes LCA accounting. Under these programs, projects with the lowest CI scores should receive the greatest incentive.<sup>17</sup>

Project-specific CI scores under the aforementioned policies are calculated via LCA accounting, which factors in GHG emissions and reductions from every step of the fuel production and utilization.<sup>18</sup> Each project-specific LCA is modelled using a version<sup>19</sup> of the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation Model (GREET)<sup>20</sup> created by Argonne National Lab, which is widely accepted among regulatory agencies and the scientific community. Given the comprehensive and established nature of these tools, RNG Coalition strongly supports using LCA accounting and the GREET model in assessment of biofuels under similar programs. To the extent that Massachusetts chooses to develop incentives for RNG procurement, we recommend they build upon this framework.<sup>21</sup>

Registries supporting tradeable credit systems and LCA for thermal energy are emerging, such as the Midwest Renewable Energy Tracking System (M-RETS). The use of such registries and harmonization with other jurisdictions undertaking similar policies could also be helpful to promote RNG projects.<sup>22</sup> Such systems increase market confidence about the environmental benefits claimed by low-carbon and carbon-negative fuels. Oregon’s new RNG procurement regulation will require the use of M-RETS in RNG procurement and compliance.

## Conclusion

RNG Coalition appreciates the opportunity to participate and provide comment on Massachusetts’ 2030 Plan development process. We are encouraged by the ongoing discussion of a variety of decarbonization policies under which RNG has the potential to contribute significant GHG reductions within the Commonwealth.

This Plan represents an exceptional opportunity to create a framework for RNG use and development, positioning Massachusetts as a leader in low-carbon fuel use. Accordingly, our members look forward to investing in and constructing new methane-capturing and RNG production facilities that create clean energy sector jobs in Massachusetts. We thank EEA for their leadership in development of a climate change mitigation and adaptation plan as such dialogue benefits the environment and the economy, energy consumers, and policymakers interested in decarbonization across North America.

Sincerely,

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<sup>17</sup> Voluntary programs for RNG—and the tools built to support such markets—are considering adopting the same general CI approach. See: <https://www.green-e.org/renewable-fuels> and <https://www.mrets.org/m-rets-renewable-thermal-tracking-system/>

<sup>18</sup> CI inputs include but are not limited to feedstock production, fuel production (upgrading and processing), fuel transport, and fuel combustion.

<sup>19</sup> The CA GREET (used by California LCFS) and OR GREET (used by Oregon CFS) are versions of Argonne National Lab’s GREET model which have been modified to include parameters specific to each jurisdiction.

<sup>20</sup> More information about Argonne National Lab’s GREET model can be found [here](#).

<sup>21</sup> While existing state-level low carbon fuel standard policies target the vehicle sector, this LCA framework can easily be adapted to other end uses (e.g., stationary thermal applications in a renewable gas standard).

<sup>22</sup> <https://www.mrets.org/m-rets-renewable-thermal-tracking-system/>

/s/

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**Robert F. O’Koniewski, Esq.**

Executive Vice President

March 22, 2021

Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

**RE: Comments on “Clean Energy and Climate Plan for 2030”**

Dear Secretary Theoharides,

On behalf of the Massachusetts State Automobile Dealers Association, thank you for the opportunity to present comments on the Commonwealth’s “Clean Energy and Climate Plan for 2030”, which was issued on December 30, 2020. Our Association represents the interests of the 427 franchised new-car and -truck dealerships in the Commonwealth, who employ over 25,000 men and women across the state and whose economic activity comprises almost 20% of the state’s retail economy.

To effect the aspirations and goals detailed in the Plan, especially those pertaining to the transportation sector, will require considerable cooperation, coordination, and investment by private and public entities, in addition to considerable buy-in by consumers, property owners, employers, and employees. No matter how much government and clean environment advocates may wish away certain transportation problems, let’s face it – our country and her citizens depend upon and have come to expect a transportation and road system that is reliable, safe, and relatively easy to traverse. Layer on top of that the fact that the large bulk of consumer goods are moved by trucks of all sizes, from the cargo van to heavy-duty tractor-trailers. We are a nation constantly on the move, and we will continue to be so regardless of the propulsion method of our vehicles.

Taken at face value, there is nothing extraordinary about a desire to move away from internal combustion engines to propulsion based on electricity, hydrogen, or other type of fuel cells which would generate no fossil fuel based emissions. ICE vehicles depend on a fuel source whose supplies are finite in nature. At some point we will pump the last drop of oil from the ground. We agree that there is no time like the present to start preparing for the inevitable.

Regarding transportation and vehicle propulsion types, our franchised dealers sell every type of vehicle that the factories produce to meet consumer demand. Consumer demand for electric, other zero-emission, and low-emission vehicles currently is a function of a number of components that will need to improve over time if complete consumer adoption of ZEVs is to work:

- **Vehicle Price Affordability.** EVs, where available from a manufacturer, are considerably more expensive than the comparable ICE vehicles. The state and federal government’s financial incentive programs are designed to subsidize current EV sales due to the higher cost factor of the new technology. Studies have shown that, without such price subsidies, EV sales crater, as we saw when our state-subsidized MOR-EV program lacked funding in late 2019. As the affordability gap narrows over time, consumer demand for EVs will rise, thereby allowing governments to eliminate these subsidies that essentially have assisted the wealthier among us to purchase more expensive vehicles. (It is this wealth gap amongst EV vs. ICE purchasers that has prompted a California air pollution control district to create a subsidy program for low- to moderate-income residents.) The universal adoption of EVs cannot rely in the long-term on

continued government subsidies which will be prohibitive for the federal and state governments in view of the number of EVs that will be needed to replace ICE vehicles.

- **Vehicle Choice.** Although it is improving as more vehicle manufacturers commit to fuller EV menus, EV options available to the consumer, to date, have been slim. Once the consumer has more to choose from, sales numbers will increase accordingly.
- **Charging Infrastructure.** This is a major challenge for EV acceptance. Currently, there is a gas station seemingly on every corner. One cannot say the same for a charging network. Considerable private and public investment will be required to fund all aspects of a charging network. This will require utilities' accommodations; permitting and zoning amendments by local governments; statewide building code requirements to support apartment dwellers and business/commercial tenants; and a clear regulatory process for private entrepreneurs desiring to run charging kiosks or stations.
- **Battery Charge Life and Charging Time.** Vehicle and battery manufacturers will need to develop batteries whose charge will provide consumers the confidence they need to travel in a manner as they now possess with ICE vehicles. Knowing the impatience of the average person, battery charge time on the road must be at a tolerable level, especially when compared to the minutes it takes to fill the gas tank of an ICE vehicle. Charging an EV overnight at home will be convenient, but needing a quick charge halfway into a trip to visit a sick parent or child may be a frustrating experience if the current time to recharge these vehicles is not improved upon.
- **Simple Mathematics.** Annually, our franchised dealers sell, on average, approximately 300,000 new cars and trucks; double that number annually for used vehicle sales at our dealerships. Committing to 100% ZEV sales by 2035 only means it could take upwards of 20 years to replace the by-then almost six million vehicles expected to be registered in Massachusetts. (This does not take into consideration what and how factors change over the next 14 years – e.g., does gasoline become so prohibitively expensive that consumers move into ZEVs at a quicker pace? The average life span of today's vehicle on the road is 12 years. As today's owners move closer to a vehicle end-of-life over the next couple of years, do they buy a ZEV or another ICE? Will the factories build product that consumers actually want and find adequate to meet their needs and tastes?) A wave of the government wand will not deliver a transition to complete ZEV compliance overnight. The consumer must be a willing and enthusiastic customer.

Finally, there are several issues that need to be addressed that many seem reluctant to confront:

- **Road Infrastructure Funding.** We long have pointed out to federal and state legislators that a stronger consumer commitment to ZEVs will mean less gas tax revenue. Simply raising the gas tax rate will not fix a growing gap. State and federal authorities need to explore equitable measures that reflect a reality of many different types of vehicles and parties using our roads. For example, ZEV owners could be charged, as in other states, a state/federal registration fee that is in lieu of gas tax charges assessed at the pump. In the alternative, legislators could explore a miles travelled charge on all vehicles, in lieu of the gas tax, to help maintain Highway Fund revenues. Motor vehicles cause road wear and use bridges, regardless of the propulsion method.
- **Increased Electricity Generation.** Much of the report depends on transitioning away from electricity generation via fossil fuel and nuclear means. The 2050 goals are laudable; however, Americans depend on a reliable, affordable electricity supply at home and work. We in the Commonwealth need our heat in the Winter and our AC in the Summer. It is reasonable to ask where our needed electricity is going to come from as current generation plants, reliably fueled by gas, coal, and nuclear, are mothballed. Can utilities and government guarantee that all residential, commercial, and industrial electric needs will be met affordably in a move to a total renewable-powered grid? Recent events in California and Texas demonstrated the need for grid reliability, especially when certain electricity generation types cannot operate. Further, on-going NIMBY movements in Massachusetts and our New England neighbors have obstructed the ability to construct power lines coming into our state from Hydro Quebec and extended the fight

for the wind farms off of Cape Cod into its third decade. Governments across the country, including Massachusetts, have set renewables standards for utilities' portfolios that are heavily subsidized by taxpayer dollars as well as by ratepayers. These portfolio standards are useless if we ultimately cannot deliver the power from these sources to electricity customers.

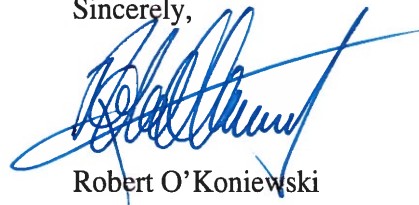
- **Charging Infrastructure Control.** Once set up, who will control the charging stations and price? There is considerable price competition and available fuel supply provided by gas stations across the land on which ICE vehicle owners rely. Here, electricity currently is controlled by regional monopolies, with pricing as approved by the Departments of Public Utilities. We know the power companies never will take a revenue hit and hate competition. The infrastructure control mechanisms need to be established in a manner that benefits consumers, who are the ones being forced to buy from a menu of only ZEVs beginning in 2035.
- **Are ZEVs Really Better for the Environment?** No one argues the benefit of cleaner air. But at what cost? The landscapes of a number of countries are being strip mined and deforested in the rush to obtain the minerals necessary to develop and build today's batteries. If nations and mining companies degrade our natural lands and beauty in the race for mineral conquests, thereby leading to erosion and groundwater contamination, is the total commitment to ZEVs then worth it? Clearly a reasonable balance must be sought to make sure we are not trading one source of pollution and environmental degradation for another. Further, national security concerns could be raised if the world's bad actors substantially possess and control the mineral components of vehicle batteries and battery manufacturing processes.

Until we know the "from where" and "at what cost" about electricity in the future, the when and how of total ZEV inventories need to be studied and coordinated with those factors to ensure a seamless junction of policy goals and not two trains running on separate tracks (however fueled).

Finally, despite characterizations from certain parties to the contrary, our franchised dealers are committed to serving the arbiters of vehicle choice – our customers. It is our customers who will determine to what extent this transition to ZEVs will succeed. Our dealers, day in and day out, meet consumer needs efficiently through our franchise system that ensures acute inter- and intra-brand competition between dealers; convenient and affordable vehicle service and maintenance; and compliance with numerous federal and state consumer protection statutes such as the lemon laws. We challenge the premise that ZEV sales have not yet taken off because dealers purposefully throw up barriers. No, ZEV sales have muddled along because the necessary pieces of this puzzle as discussed herein have yet to be developed, nurtured, grown, and meshed together. Only then will we have a robust ZEV marketplace. Our dealers are engaged and enthused about the future for new vehicle offerings and markets. Our dealers have been long-committed to being part of the solution moving forward.

Thank you for your attention to this matter. Should you require additional information, please do not hesitate to contact us.

Sincerely,



Robert O'Koniewski

## 350 Massachusetts for a Better Future: Comments on 2030 CECP

350 Massachusetts for a Better Future thanks Secretary Theoharides for the opportunity to submit reactions to the draft 2030 CECP. 350 Massachusetts is a statewide network of volunteers taking action for urgent and environmentally just measures to reduce GHG emissions to net zero. We operate through direct action and through advocacy to legislative and executive decision-makers at the local, municipal, and state level.

We applaud the outlines of the Plan, but we find it lacking in urgency and measurability, and in sustained attention to equity and environmental justice. We also have specific criticisms of some of the Plan's measures.

The climate crisis is global, real, and urgent. It demands an accelerated policymaking process; the CECP must reflect this.

The planned reduction of GHG emissions in 2030 to -45% of 1990 levels is insufficient in itself and weighted towards the second half of the decade. The plan needs measurable and enforceable benchmarks for 2021-2025. Moreover, the claim that the 2030 CECP will make zero emissions by 2050 achievable is misleading. The Plan cannot address GHG emissions embedded in food, imported products, and air travel, which fall outside its scope but contribute to GHG emissions caused by Massachusetts citizens. These must be dealt with through other policies. Such considerations call for more ambitious and adaptive commitments.

While the Plan's introduction acknowledges the centrality of equity and environmental justice, its specific policies fail to demonstrate concretely how they advance equity and EJ goals. The CECP's policies should set stronger benchmarks and metrics to measure progress in this area as well, emphasizing the health, jobs and other equity co-benefits of GHG reductions. The plan should acknowledge and incorporate the recommendations of the GWSA IAC climate justice working group.

Since 350 Massachusetts' current campaigns focus on transportation and buildings, we offer below more detailed comments on these areas, reflecting our general concerns with urgency, measurability, and justice. For transportation, the plan relies too heavily on the dissemination of electric vehicles and neglects public transit. Public transit benefits low-income and EJ communities and offers the administration direct leverage for immediate progress on electrification. The housing plan acknowledges the need for code changes and extensive retrofits but offers a slow and vague ramp to action and neglects to plan for a just transition for workers. Comments by sector follow.

### **Transportation:**

We endorse the plan's goals for a low-carbon fuel standard, electrification of the private fleet, and provisions for electric vehicle (EV) infrastructure. These goals should be part of a multi-pronged approach to reduce vehicle miles traveled (VMT) by funding a robust, electrified public transit system and by increasing pedestrian and bicycle infrastructure.

Currently only 1% of the light duty fleet is EV, growing about 1% per year. To reach 50% of sales in 2030, growth must increase to at least 4%/year. Due to the lag in removing older gas-powered vehicles from the roads, all vehicle sales must be EVs by 2035 at the very latest to achieve net zero emissions by 2050. Much higher upfront rebates, targeting low-income buyers, and incentives for dealers will be necessary. Charging infrastructure must reflect a full range of needs: housing complexes, business parking lots, on-street.

Transportation climate solutions cannot rely on EVs alone. Electric vehicles still pollute; even when they are 100% powered through renewable electricity, they require materials for construction of power supplies and electricity transmission, batteries, and the production and discarding of the vehicles. Particulate pollution from tires impacts public health, parking and highway infrastructure harms the environment, and congestion and car-oriented development detract from quality of life.

We need a public transit service that is frequent, reliable, and shaped by the needs of its riders, including access to shopping, health care, education, and recreation as well as work commutes for a full range of working schedules. Massachusetts should greatly accelerate the electrification of public transit fleets and maintenance facilities, delivering air quality improvement to pollution-burdened communities and leveraging the transportation sector over which it has most control. School bus fleets should also be an electrification priority.

Pedestrian and bicycle infrastructure and safety (including safe road crossings) are essential support to public transit use as well as being zero emissions alternatives to car trips. Making walking and biking safer and more available also improves public health (and saves public health costs) and advances equity (Black, Brown, and low-income communities suffer disproportionately from traffic fatalities) as well as reducing GHG emissions.

We approve the planned use of TCI funds to support investment in clean, equitable, and livable transportation. We urge Massachusetts to set a high proportion for investment in EJ and underserved rural communities and to establish its Equity Advisory Board quickly and give it a real and effective voice in TCI investments. However, TCI is not a magic bullet. The governor and legislature need to work together to ensure stable revenue for transportation investment, especially for public transit. We should also plan to respond effectively to increased or restructured federal funding.

### **Buildings:**

The CECP correctly identifies emissions from heating residential and commercial buildings as the number two source of GHG emissions in the Commonwealth (transportation is number one). We agree with the outlines of the Plan's approach to a solution: code and other changes to ensure that new buildings are zero emissions, and a wide-ranging retrofit program to get existing buildings to replace fossil-fuel heating systems with non-emitting alternatives. The former would come through the creation of a stretch code adoptable by cities and towns now as an interim step towards a statewide zero-emissions code to be adopted in the near future. The latter would build on and expand the Commonwealth's existing energy efficiency programs (Mass Save).



However, the plan is vague on the critical programs that will be needed to meet its goals and shockingly lackadaisical about the timeline for action. The overall strategy of the retrofit portion of the program calls for retrofitting one million homes and 300,000 commercial buildings to zero or near zero emissions over the next ten years. Right now Mass Save is completing less intensive retrofits at about one fifth that speed. Despite the goal of 45% reduction from 1990 levels by 2030 (now raised by the legislature to 50%), the Plan sets up a several year ramp-up to action. Mass Save incentives will be adjusted during the current 3 year operational cycle, to go into effect in 2023 or 2024. Moreover, the Plan relies on solutions that do not currently exist for a significant part of its emissions reductions, adding “non-emitting” oil to heating oil, or hydrogen to natural gas.

The relatively long life of HVAC equipment, often 20-30 years, means that equipment installed in the 2020s may still be in service by 2050. About one million residential gas, oil, and propane furnaces and boilers will likely reach their end-of-life between 2021 and 2030. Sales of electrified and other clean or renewable heating alternatives need to ramp up quickly to take advantage of as many of these transition points—the times during the 2020s when businesses and homeowners will be replacing heating systems—as possible. But the proposal does not call for requiring such changes or offer a strategy to get building owners to switch from fossil fuel heating.

If the administration were treating the building sector as a quick-start part of the overall goal for reaching net zero by 2050 or earlier, this plan would look different. It would start with instructing Mass Save and the low-income weatherization network to prepare new diagnostic formulas and cost-effectiveness calculations to allow the agencies to propose zero emissions strategies for every building they touch. It would instruct and assist those agencies to ramp up plans for increased production, and would shift some of the goals now assigned to biofuels to increased results from energy efficiency in buildings (air sealing, insulation, mechanical ventilation). It would be actively engaging with the HVAC industry and the people running the pilots on district water loops to make ground source heat pumps financially viable in urban sites to speed that process out of the pilot phase and into production. Moreover, since the governor’s plan for the next ten years relies heavily on replacing oil and propane furnaces and boilers with heat pumps, the Plan would provide for a just transition for the workers in the heating oil and propane storage and delivery system, and some method of helping those firms participate in the transformation of the Commonwealth’s system for heating buildings.

CECP lays out the current status of the heating buildings in the Commonwealth, and sets admirable goals for reducing emissions from this sector. But there is very little plan for achieving these goals, and very little sense of urgency in getting started on the dramatic changes that CECP itself calls for.

**Conclusion:**

Although detailed and urgent planning to address the climate crisis is vital, it is the actual implementation that will determine whether Massachusetts will meet its climate goals. We urge the administration to begin immediately to act in concrete, measurable ways on a Plan that matches the urgency of the situation.

Thank you again for the opportunity to comment.

## Documentation of the Carbon Footprint of Hydro Québec's Hydropower

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Cecil and Ida Green Professor of Earth Sciences  
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Massachusetts Institute of Technology

### *Summary*

The purpose for building NECEC is to provide a conduit for ~ 10 TWh/yr of electricity to Massachusetts. The premise used to justify NECEC is that this power would result in much less net emission of greenhouse gasses than what would be produced from electricity generated using modern natural gas power plants (~ 400 g CO<sub>2</sub>/kWh). Yet despite claims that its power is “low-carbon,” Hydro Québec (HQ) has provided no formal documentation of this claim.

In this white paper I provide relevant references, as well as giving a road map through these references to finding values of CO<sub>2</sub>e emissions of HQ reservoirs. The information in the peer-reviewed literature demonstrates that a large fraction of HQ power is not low carbon.

A growing number of peer-reviewed articles in the scientific literature address the carbon footprint of hydro reservoirs worldwide. By studying these papers and the on-line supplementary materials accompanying them, I have assembled sufficient information to determine the greenhouse gas emissions of 18 of HQ's major reservoirs – those that generate in excess of 1 TWh/yr of electricity each. There is a tremendous range in HQ emissions – from 5 g CO<sub>2</sub>/kWh (half that produced by wind) to 2265 g CO<sub>2</sub>/kWh (twice that produced by coal). About half of HQ generation is comparable in emissions to natural gas. These estimates are given in a table and illustrated in a figure in the final two pages of this document.

### *Relevant literature*

About 20 years ago, scientists began to recognize the possibility that reservoir greenhouse gas emissions are significant (e. g., St. Louis et al., 2000). In particular, HQ undertook an extensive research program to measure the fluxes of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O in their reservoirs and surroundings. Tremblay et al. (2005) published measurements of greenhouse gas fluxes for many Canadian reservoirs, including most existing HQ reservoirs. Fluxes were reported in mg/m<sup>2</sup>/d. (There is tremendous scatter in the observations for a given reservoir because emissions vary greatly in space and time. The standard deviation of the values reported are approximately equal to the values themselves.)

Teodoru et al. (2012) measured variations in emissions as a function of time over the three years following the filling in 2006 of the new Eastmain-1 reservoir in Québec. They found that

initially the CO<sub>2</sub> footprint was comparable to a coal fired power plant, but decreased to that of a modern gas plant after 3 years. They extrapolated the data to conclude that, over 100 years, the cumulative emissions of this reservoir would be about half that of a gas plant

Barros et al. (2011) compiled data from about 100 hydro reservoirs worldwide, concluding that emissions were correlated with reservoir age and latitude. His data set included Tremblay's (2005) data.

Hertwich (2013) made an important advance by making estimates from the web of the amount of energy generated by these reservoirs. This made it possible to convert the conventional measurements of emissions per unit area to obtain emissions per kWh.

Scherer and Pfister (2016) used the ~150 reservoirs in the Hertwich (2013) data set to fit a general linearized model, explaining most of the CO<sub>2</sub> emission variation using only two variables: Hertwich's area/electricity ratio and the logarithm of reservoir area. They then used the recently developed Global Reservoir and Dam Database (GRAND, see Lehner et al., 2011) to estimate model-based fluxes for ~ 1500 reservoirs worldwide. The supplementary data files of Scherer and Pfister (2016) provide a convenient source for the Hertwich (2013) data set, as well as an alternative estimate (from GRAND) for energy generation in 2009.

Deemer et al. (2016) also augmented the Barros et al (2011) data set with more recent measurements. However, they focused on reservoirs where methane is the main greenhouse gas, and their study does not add substantially to information about HQ reservoirs.

#### *Estimates of Hydro Québec CO<sub>2</sub>e footprint*

Table 1 gives estimates, using four approaches, for the CO<sub>2</sub> equivalent emissions (g CO<sub>2</sub>e/kWh) for the 18 HQ reservoirs generating > 1 TWh/yr. Because generation by any power plant varies from year to year, there are two estimates used: H13 is the older value provided by Hertwich (2013), while S&P is the value for 2009 provided by Scherer and Pfister, 2013. Systems are ranked by using the larger of these two values. (Note that the H13 value for the Robert-Bourassa system is anomalously large, and not in line with others in the La Grande system, making me skeptical of this value.)

The values of CO<sub>2</sub>e (g/kWh) in the columns labeled "S&P data" were calculated using the two estimates of energy (in TWh) with data for reservoir emissions in the Scherer and Pfister (2016) table. The "S&P model" column gives Scherer and Pfister's (2016) values for their two-parameter model. The "T12 data" gives Teodoru et al.'s (2012) observed emissions for the Eastmain-1 reservoir in 2009, three years after it was flooded. Cells where there was no information are left blank. Cells where greenhouse gas emissions exceed that of natural gas are highlighted in yellow. Cells where greenhouse gas emissions exceed that of coal are highlighted in red.

Even though HQ's two top power producers, Robert-Bourassa and Churchill Falls, are over 40 years old, they both have carbon footprints approximately equal to that of modern natural gas. Brisay/Caniapiscau is two times dirtier than coal. Most of HQ's power has a much greater carbon emissions than wind.

Table 1: Estimates of CO2e for Hydro Québec's reservoirs > 1 TWh/yr

System	Area (km2)	TWh			CO2e g/kWh			
		Max	H13	S&P	S&P data H13 TWh	S&P data S&P TWh	S&P model S&P TWh	T12 data H13 TWh
Robert-Bourassa (La Grande-2)	2835	37.4	37.4	5.2	57	412	576	
Churchill Falls*	4816	30.8		30.8			436	
Bersimis	798	12.5	12.5	7.8	35	56	313	
La Grande 4	765	10.1	10.1	8.9	46	52	309	
Manic 5	1973	9.8	9.8		124			
La Grande 3	2420	8.7	8.7	8.4	210	217	451	
La Grande 2A	2835	7.1	7.1		222			
Manic 2	124	6.5	5.1	6.5	10	8	180	
Manic 3	236	5.8	4.9	5.8	6	5	219	
Bersimis 2	38	5.5		5.5			119	
La Grande 1	70	4.5	4.5	2.7	12	20	165	
Outardes 3	11	4.5	3.2	4.5			42	
Outardes 4	625	3.7	2.6	3.7	194	138	329	
Laforge-1	960	2.7	2.7	1.7	371	588	605	
Eastmain-1	600	2.7	2.7		309			275
St-Marguerite 3	253	2.6	2.6		197			
Outardes 2	26	2.0		2.0			102	
Brisay/Caniapiscau	4318	1.2	1.2	0.8	1501	2265	2250	

\* Churchill Falls is in Labrador, but almost all of its power goes to HQ.

Figure 1 illustrates the range of estimates for these reservoirs in a bar graph. For reference, the line showing 400 g CO<sub>2</sub>e/kWh is the value for a modern natural gas power plant.

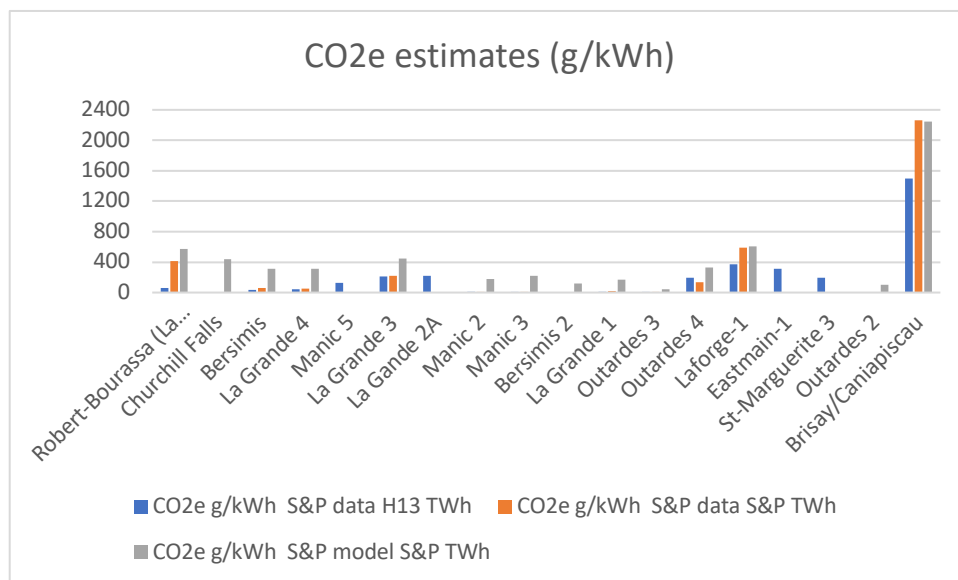


Figure 1: CO<sub>2</sub>e (g/kWh) estimates for HQ's reservoirs generating > 1 TW/y.

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March 22, 2021

His Excellency Charles D. Baker  
Governor of the Commonwealth  
State House, Room 360  
Boston, MA 02133

*Delivered Electronically*

Dear Governor Baker,

On behalf of the cities and towns of the Commonwealth, the Massachusetts Municipal Association appreciates the opportunity to submit comments on the Baker-Polito Administration's Clean Energy and Climate Plan for 2030. We applaud your commitment to addressing the climate crisis as a core priority of your Administration through both mitigation and adaptation strategies. Our members are committed to helping the Commonwealth achieve its net-zero-by-2050 goal and the interim targets set in this plan.

As stated in the plan, local government plays an essential role in statewide climate change mitigation efforts, implementing clean energy and efficiency initiatives to reduce greenhouse gas emissions and accelerating the transition to a cost-saving low-carbon economy. Many municipalities have already started to take important action and stand ready to implement the local strategies outlined in your plan, including "siting of new renewable energy and transmission resources; implementation of zoning and building ordinances that support the development of high-performance, low-carbon emitting buildings and smart growth; expansion of the electric vehicle charging network; increasing climate adaptation and resilience; and equitable implementation of policies that impact residents and businesses in their jurisdictions" (pg. 9).

Cities and towns will need substantial financial and technical assistance resources to implement the strategies and targets outlined in the plan. Municipalities are grateful for the initiatives spearheaded by the Administration that help communities develop solar energy capacity, transition to electric vehicles and facilitate their use, and divert recyclable materials from the solid waste stream, to name only a few examples of state support for municipal emissions reduction. Additional resources should be distributed equitably to ensure that all communities have the ability to take necessary action, with a focus on economically and fiscally challenged cities and towns, and smaller and more rural communities. To be successful, this initiative cannot impose new unfunded mandates on local governments, as that would undermine progress on our shared climate goals, and compromise other aspects of municipal operations.

We are pleased that the Administration seeks to ensure that the policies reflected in the plan "do

not exacerbate but instead assist in closing the health and economic disparities experienced in environmental justice communities and communities of color” (pg. 10). The MMA applauds this commitment to supporting environmental justice communities and populations most vulnerable to the causes and effects of climate change.

The MMA also asks that you consider enhancing the description of a “high-performance” stretch energy code to include a definition of net-zero buildings. In a letter to the conference committee reconciling House and Senate climate bills last September, the MMA requested language that “would direct the state to develop and adopt, as an appendix to the state building code, and in consultation with the Board of Building Regulations and Standards, a municipal opt-in specialized stretch energy code that includes, but is not limited to, a definition of net-zero building.” We noted that several of our member cities and towns are taking action locally to plan for and construct net-zero buildings, and incorporating an optional net-zero stretch energy code into the state building code would facilitate and improve efforts already underway between municipalities, the construction industry, and the state to reduce emissions. We would like to see similar language in the Clean Energy and Climate Plan.

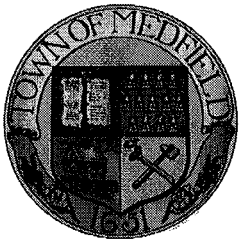
The MMA and our member municipalities appreciate your Administration’s partnership with cities and towns, as this collaboration is essential to address the climate crisis for the next decade and beyond. If you have any questions about our comments or require additional information, please do not hesitate to have your office contact me or MMA Legislative Analyst Ariela Lovett at [alovett@mma.org](mailto:alovett@mma.org) or 973-634-5307 at any time.

Thank you very much.

Sincerely,

A handwritten signature in black ink, appearing to read 'G. Beckwith', written in a cursive style.

Geoffrey C. Beckwith  
Executive Director & CEO



**TOWN OF MEDFIELD**

*Office of*

**BOARD OF SELECTMEN**

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**Kristine Trierweiler**  
*Town Administrator*

March 19, 2021

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

**RE: Medfield comments regarding the Interim Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides,

The Town of Medfield is pleased to respond to the Interim Clean Energy and Climate Plan for 2030 ("2030 CECP").

The Town of Medfield has grave concerns regarding the impact climate change will have on the Commonwealth, the United States, and the world, and we have each made strong commitments to reducing greenhouse gas emissions. We appreciate the thoughtful analysis the Executive Office of Energy and Environmental Affairs (EEA) has conducted to understand the complex scientific, technological, and economic impact for various roadmaps.

As we work with you to advance our shared focus on climate mitigation, our Town is struggling to answer the same question the EEA posed in the 2050 Decarbonization Roadmap Study:

***How can we achieve Net Zero while maintaining a healthy, equitable, and thriving economy?***

The release of the 2050 Decarbonization Roadmap Study and the 2030 CECP, which provides a rich and diverse collection of strategic state actions cities and towns can use to build local implementation plans, is an important first step, and we agree with the plan's overall approach to reducing emissions. Specifically, we agree with the bold actions, such as pressing BBRS to quickly implement a 2050-compliant building code, establishing 2035 as the end of sales of fossil fuel vehicles and taking actions that would change the goals and priorities of Mass Save and the Department of Public Utilities so as to align with our climate goals.



To further enhance the Commonwealth's plan, we provide the following specific requests from the viewpoint of our Town who is endeavoring to do our part in achieving Massachusetts' climate goals and to model leading municipal actions within the state and nationally:

### **1. Establish a Municipal Version of the GWSA Implementation Advisory Committee**

The Interim CEC Plan states that, "It will take action at all levels of government..." and "...continued action by local government across the Commonwealth is required." We agree with this statement and encourage the Commonwealth to formally engage municipalities in the Plan's implementation. We recommend establishing a Municipal version of the GWSA Implementation Advisory Committee to provide an ongoing bridge for communications between state and local government. The Committee should be designed to reflect the diverse nature and needs of municipalities based on size, location, and economic structure.

### **2. Increase Funding for Municipal Climate Action**

The Town of Medfield encourages the Commonwealth to realize that, because work is needed at all levels of government, so too are new funds needed at all levels. Without this local support, which the 2030 CECP describes as "required", local actions will be delayed, sporadic or in too many cases not available at all.

Local funding should be prioritized for regional collaboration which leads to greater efficiency and uniformity among neighboring municipalities. These resources are needed at three levels. First, the Commonwealth should provide support at the community level such as funding for sustainability coordinators for program administration as well as funding for community-wide coaching to guide an equitable transition to 2050-compliant technology for all stakeholders. Second, municipalities need experts who can serve as resources in clean energy and sustainability technologies who can be available regionally to define and share best practices among cities and towns and ultimately to negotiate better deals with vendors. Third, it is crucial that municipalities are included in the improvements and expansions made to grant, rebate, and incentive programs (including renewable energy incentive programs) that will help them lead by example. Funding to facilitate, implement, maintain, and operate clean energy and electrification technologies such as EV charging station networks and clean heating equipment will be crucial to accelerating municipalities' progress to net zero.

### **3. Update the Building Code with a High-Performance Stretch Energy Code**

The 2030 CECP correctly identifies the importance of moving quickly to a "new, high-performance stretch energy code requiring passive-house level building envelope efficiency." In doing so, the 2030 CECP outlines a plan to "present a new high-performance stretch energy code to the Board of Building Regulations and Standards (BBRS) in 2021 that allows for Green Communities to opt in starting in 2022 and that it will become mandatory and effective statewide no later than January 1, 2028."

The Town of Medfield, which has been designated as a Green Community – supports the development of a new high-performance stretch energy code and the rapid, orderly transition to this code. To encourage early adoption by Green Communities, we recommend a pool of grant money be made available exclusively to Green Communities who adopt the high performance energy stretch code prior to 2028. This would accelerate adoption of 2050-compliant technology statewide, and this incentive would provide motivation for existing Green Communities to move quickly toward the goal we share.

The Town of Medfield welcomes partnering with the DOER to further discuss these requests.

#### **4. Align Funding for Public Buildings with Net Zero Goals**

The 2030 CECP acknowledges the importance of “avoiding new infrastructure or construction that is based on fossil-fuels for heating which would not be 2050 compliant, as well as ensuring that new equipment and products within buildings are on the path towards 2050 compliance.” However, one of the largest funders of new public buildings, the Massachusetts School Building Authority (MSBA), does not currently require districts to seriously consider 2050 goals in the design and construction of new or renovated school buildings.

At present, the MSBA provides two additional reimbursement points to projects that exceed the Massachusetts Energy base code by 20%. While this is a step in the right direction, it does not go far enough. School districts across the state, including Acton-Boxborough, Arlington, Belmont, Brookline, Cambridge, Lexington, Watertown, Wellesley, and Westborough are demonstrating that fully electric, net zero ready schools – and other building types – are possible and that they do not present a significant financial burden to taxpayers. The Town of Medfield urges the EEA to require all new public buildings that are funded by the Commonwealth to be net zero ready starting in 2022 and to direct additional funding through such avenues to support the implementation of innovative clean energy and sustainability solutions in their construction.

#### **5. Prioritize Public Transit in Transportation Emission Reduction Strategies**

While the Town of Medfield applauds the plan’s focus on the “near-term, widespread electrification of the majority of the Commonwealth’s vehicles,” the absence of a clear strategy to improve and expand public transit is worrisome.

The only mention of public transit in the 2030 CECP is in relation to the Transportation and Climate Initiative Program (TCI-P), which “will also help support investments that will make it easier to get around without a car, such as improved public transportation.” This singular reference to public transit reflects an inadequate level of attention to a resource that is critical to maximizing the effectiveness of smart growth policies in our community and across the

Commonwealth and is equally necessary in advancing equity in the transition to net zero. The Town of Medfield asks the EEA to re-evaluate the role of public transit in achieving the state's 2030 emissions reduction goal and, at a minimum, to provide further detail on how TCI-P funding will be used to improve public transportation

## **6. Provide Resources to Accelerate Electrification Locally**

While municipal governments have limited expertise in emerging technologies like electric vehicles and heat pumps, we have unique insight into our community and the concerns of local property owners who will be making decisions on the adoption of carbon-free technologies. As a municipality, we are eager to support early adopters and normalize these technologies, similar to the experience many communities have had participating in the Massachusetts Clean Energy Center's Solarize and HeatSmart programs.

As MassCEC transitions from supporting community-level technology campaigns, we ask the state to provide municipalities with training, engineering services, technical support, web-based resources, procurement tools, implementation services and more to educate and engage with our residents and business owners about electrification opportunities.

## **7. Increase Access to Emissions Data**

Local data supports local decisions, and provides feedback on progress. At present, state agencies and public utilities capture data about emissions-related activities occurring in local communities, but do not maintain or share the data in a timely manner that allows communities to assess needs, affirm actions, or allow for adjustments.

The Town of Medfield asks the Commonwealth for increased access to emissions-related data that impact our cities and towns. This includes the number of electric and battery electric vehicles registered in our communities, the number of kilowatt-hours generated by solar panels located in our communities, the number of heat pumps installed in our communities, the number of properties that have participated in MassSave by Census blocks and the types of energy efficiency improvements taken, and more.

A step in the right direction is the Metropolitan Area Planning Council's (MAPC) new tool for measuring community-wide greenhouse gas emissions, which was funded by an EEA grant. This tool allows any Massachusetts community to estimate its community-wide emissions without the added cost of hiring a consultant. It is a tremendously valuable start, but even it is handicapped by stale data – most notably the 2014 Massachusetts vehicle census, which – more than five years later, remains the most recent valid vehicle census available from the state.

The Town of Medfield also believes the Massachusetts Legislature plays an essential role in conveying the voice of citizens as well as providing funding and legal mandate to the goals and path forward for the Commonwealth. There are many valuable elements of the climate

legislation currently being considered in the Statehouse, and the Town of Medfield urge the Baker Administration to act quickly on this and to seek a compromise to ensure a climate bill is passed early in 2021, which will ensure the 2030 CECP has the full support of the state government.

We are proud to be part of Massachusetts's effort to achieve net zero by 2050 and look forward to collaborating with you to realize our shared goal.

Thank you for your commitment to the climate.

Sincerely,

A handwritten signature in blue ink, appearing to be 'Osler Peterson', with a long horizontal flourish extending to the right.

Osler Peterson

A handwritten signature in blue ink, appearing to be 'Michael Marcucci', with a long horizontal flourish extending to the right.

Michael Marcucci

**Medfield Board of Selectmen**

March 22, 2020  
Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

**Re: Public Comments for Interim Clean Energy and Climate Plan (CECP) 2030 – A Focus on Transitioning from Carbon Intensive and Polluting Landscaping Equipment**

Dear Secretary Theoharides:

We are a diverse group of residents in Lexington, Massachusetts committed to sustaining healthy and vibrant local ecosystems. Our group includes experts in gardening, ecology, entomology, air quality, and climate science. Our work is based on recognizing that global warming, ecological deterioration, and our widespread use of pollutants are inherently connected in a damaging positive feedback cycle.

How we manage our landscape – our lawns, gardens, parks, and other open spaces – presents a low economic stakes and high-reward opportunity as part of a comprehensive clean energy and climate plan for the Commonwealth. To illustrate: an EPA study from 2015 found that 27 million tons of pollutants are emitted from gasoline-powered lawn and garden equipment (GLGE), representing 25-45% of all non-road gasoline emissions<sup>1</sup>. Of the 27 million tons of GLGE emissions, about 75% is carbon dioxide. The remaining 25% include ozone precursors and other carcinogenic or otherwise toxic air pollutants such as nitrogen oxides, benzene, formaldehyde, 1,3-butadiene, and carbon monoxide. **A meaningful and effective Clean Energy and Climate Plan for 2030 (CECP) must therefore include programs that incentivize cities and towns to transition away from GLGE.** A promising template for programs that protect the health of residents and ecosystems while reducing undue burdens on small businesses is represented by MA House Bill HD.3466, “An Act to establish a grant program for low noise, low emissions landscape maintenance equipment”, co-sponsored by Reps. Ciccolo and Minicucci.

The evidence is clear about the health and climate impacts of GLGE on local communities, on equipment operators, and on our ecosystems. Gas-powered landscape equipment – most notably leaf-blowers – are highly polluting in addition to being an unnecessary component of our mounting greenhouse gas debt. One study showed that the hydrocarbon air pollutants emitted by running a gas-powered leaf blower for 30 minutes is equivalent to those emitted by driving a pickup truck nearly 4000 miles<sup>2</sup>. It is also well known that noise pollution is associated

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<sup>1</sup> Banks, J. L. and McConnell, R. “National Emissions from Lawn and Garden Equipment”. *Final Report, US Environmental Protection Agency Region 1*. 2015. <https://www.epa.gov/sites/production/files/2015-09/documents/banks.pdf>

<sup>2</sup> Kavanagh, J. “Emissions Test: Car vs. Truck vs. Leaf Blower”. 2011. <https://www.edmunds.com/car-reviews/features/emissions-test-car-vs-truck-vs-leaf-blower.html>

with hearing loss as well as multiple stress-related comorbidities in humans and wildlife alike.<sup>3,4</sup>

We, therefore, urge the Baker administration to include a transition plan away from GLGE as an essential part of the CECP. We have a clear opportunity to adopt practices that can help the Commonwealth achieve its climate and energy targets while creating a healthier, more environmentally sustainable, and economically resilient place to live.

Sincerely,

Archana Dayalu, Ph.D., *Sustainable Lexington Committee Member*  
Marcia Eastham Gens, *Lexington Green Network*  
Pamela Lyons, *Lexington Precinct 5 Town Meeting Member*  
Charles Wyman, *Sustainable Lexington Committee Member*  
Ricki Pappo, *Chair, Lexington Global Warming Action Coalition (GWAC); Lexington Precinct 2 Town Meeting Member*  
Georgia Harris, *Ecological Landscape Alliance (ELA) Newsletter Editor*  
Sara Bothwell Allen, Ph.D., *Lexington Precinct 6 Town Meeting Member*  
Todd Rhodes, *Sustainable Lexington Committee member*  
Rick Reibstein, *Adjunct Professor, Environmental Law and Policy, Boston University*  
Daniel Koretz, Ph.D., *Chair, Lexington Noise Advisory Committee*  
Cynthia Arens, *Sustainable Lexington Committee Member; Lexington Precinct 3 Town Meeting Member*  
Lin Jensen, *Lexington Town Meeting member; LPS Green Teams*

*Note: Letter signers are acting as individuals, and affiliations are provided for informational purposes only. The content of this letter does not necessarily reflect any official positions of the named organizations/groups.*

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<sup>3</sup> Center for Disease Control (CDC). “Too Loud! For Too Long! Loud noises damage hearing”. *Vital Signs Report*. 2017. <https://www.cdc.gov/vitalsigns/pdf/2017-02-vitalsigns.pdf>

<sup>4</sup> Kleist et al., 2018. “Chronic anthropogenic noise disrupts glucocorticoid signaling and has multiple effects on fitness in an avian community”. *Proc. Natl. Acad. Sci.* 2018. <https://doi.org/10.1073/pnas.1709200115>



# AMERICAN PUBLIC GAS ASSOCIATION

March 22<sup>nd</sup>, 2021

Submission via “Public Feedback on 2030 CECP” portal.

Re: Interim Clean Energy and Climate Plan for 2030

Dear Governor Charles Baker, Lieutenant Governor Karyn Polito, and Secretary Kathleen Theoharides:

The American Public Gas Association (APGA) is pleased to respond to the request for comments to the *Interim Clean Energy and Climate Plan for 2030* (2030 CECP). APGA is the trade association for approximately 1,000 communities across the U.S., including four in Massachusetts, that own and operate their retail natural gas distribution entities. Public gas systems are not-for-profit and locally accountable to the citizens they serve. They provide safe, reliable, and affordable energy to their customers and support their communities by delivering fuel to be used for cooking, clothes drying, and space and water heating, as well as for various commercial and industrial applications.

APGA members are good stewards of the environment, evidenced by the way they maintain and operate their utilities, and they recognize that natural gas can provide energy affordably and reliably to all Americans, in addition to proven environmental benefits. Natural gas has been a big driver behind our country’s declines in carbon emissions, and the existing pipeline infrastructure should continue to play an integral role in reducing greenhouse gas (GHG) emissions.<sup>1</sup> The responses provided below elaborate on these points, and APGA hopes you will take them into consideration in your progress with the 2030 CECP.

## **1. Massachusetts’ Community-Owned Gas Utilities Are Unique**

Massachusetts’ four community-owned natural gas utilities are governed locally by elected Boards, whose policies represent only the wishes of those they are representing. The services provided and rates charged are unique to each community, and their operations reflect local input and values. Unlike for-profit, corporate natural gas companies, community-owned gas utilities are not-for-profit entities, and they are in the business of providing public service, not selling commodities. They are committed to maintaining affordable energy costs for their neighbors, including low-income families, seniors, and other vulnerable communities. They put people over profits by reinvesting in the reliable and secure infrastructure in the cities and towns they serve, which delivers the energy those residents need and prefer at an affordable price.<sup>2</sup> Typically, these community-owned gas systems are much smaller than their investor-owned counterparts, and the public gas utility employees are local, focused on serving their neighbors. In fact, the 4 public gas utilities in Massachusetts average service to just less than 8,000 meters.

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<sup>1</sup> American Gas Association, “Implications of Policy-Driven Residential Electrification,” <https://www.aga.org/research/reports/implications-of-policy-driven-residential-electrification>

<sup>2</sup> Woodland, O’Brien, and Scott, “New Homeowner Energy Preference Survey,” <https://www.energysolutionscenter.org/>.

As Massachusetts moves forward with GHG reduction policies, APGA requests that the unique operating characteristics of public gas utilities are taken into account, and we urge you to work with our member communities to find local solutions, avoiding one-size-fits-all mandates that usurp local control.

## **2. Massachusetts' Community-Owned Gas Utilities Ensure Energy Resiliency**

Energy supplied by Massachusetts' community-owned gas utilities plays a critical role in ensuring energy resiliency in the communities they serve. A recent report by the Natural Gas Council reveals:

The operational characteristics of the natural gas transportation network, in combination with the physical properties of natural gas, effectively minimize the likelihood and severity of service disruptions. In the rare event of a disruption, impacts are typically localized and brief. History demonstrates that disruption of firm pipeline transportation and/or storage services resulting from severe weather events are extremely rare.<sup>3</sup>

Energy availability is not negotiable, especially considering the importance of home heat during a Massachusetts winter. The Boards that oversee the four municipal utilities constantly hear from residents that their natural gas service is reliable, which makes it a desired energy source in the state. Further to this, natural gas can power generators to provide numerous families with a dependable source of power when electricity is unavailable. A trustworthy and diverse energy supply is critical to both national and domestic security, and we urge the state to be mindful to protect Massachusetts' energy resiliency through the continued utilization of natural gas.

## **3. Massachusetts' Community-Owned Gas Utilities Deliver Affordability**

Natural gas is a key component in maintaining affordability in the communities served by Massachusetts public gas systems, and these residents continue to want this low-cost energy option. Currently, consumers pay relatively low prices for the direct use of natural gas for their cooking, home or water heating, and clothes drying needs. The Department of Energy (DOE) recently published its "2021 Representative Average Unit Costs of Energy," acknowledging electricity is \$39.01 per million Btu, and natural gas is \$10.64 per million Btu.<sup>4</sup> A study also shows households with all-electric appliances pay almost \$900 a year more than those that have the traditional mix of natural gas and electric.<sup>5</sup>

The comparable affordability of natural gas is a key tool in addressing the social equity concerns posed by household energy burdens. A recently released report by the American Council for an Energy-Efficient Economy (ACEEE) noted:

"energy insecurity — the inability to meet basic household energy needs over time — is gaining attention as a major equity issue. Examining energy burden gives an idea of energy affordability

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<sup>3</sup> Natural Gas Council, "Natural Gas: Reliable and Resilient." <http://naturalgascouncil.org/wp-content/uploads/2019/04/Natural-Gas-Reliable-and-Resilient.pdf>

<sup>4</sup> Department of Energy, "Energy Conservation Program for Consumer Products: Representative Average Unit Costs of Energy," <https://www.federalregister.gov/documents/2021/03/17/2021-05482/energy-conservation-program-for-consumer-products-representative-average-unit-costs-of-energy>

<sup>5</sup> American Gas Association, Implications of Policy-Driven Residential Electrification, <https://www.aga.org/research/reports/implications-of-policy-driven-residential-electrification/>



and which groups could most benefit from energy justice and energy affordability policies and investments.”<sup>6</sup>

ACEEE’s report further highlighted that low-income, Black, Hispanic, and Native American households are the demographics most impacted with higher energy burdens. Therefore, Massachusetts should not discount the direct use of natural gas as a key resource in decreasing energy burden. The policies and programs in the 2030 CEP are aiming to provide a “people-centered approach to reducing GHG emissions in ways that help close the health and economic disparities experienced in Environmental Justice communities.” Continued access to natural gas can ensure these groups can affordably heat their homes or water.

#### **4. Massachusetts’ Community-Owned Gas Utilities Play an Important Role in a Low Carbon Future**

RNG is pipeline-compatible, ultra-clean, and low-carbon. It is derived from the breakdown of organic wastes and can be processed to be used in existing natural gas infrastructure interchangeably with geologic natural gas in homes and businesses. Hydrogen has the capability to be blended with natural gas or possibly used exclusively; both have decreased emissions. In the future, blended hydrogen or hydrogen exclusively may be safely utilized in homes, businesses, and commercial applications. RNG and hydrogen can provide balanced energy solutions, helping Americans lessen environmental impacts, all while still using the existing, safe, and resilient infrastructure. By preserving the natural gas infrastructure of today, Massachusetts’ public natural gas utilities can be a critical partner in delivering the low carbon fuels of tomorrow, ensuring sustainable energy for many years to come.

APGA would like to reiterate that our members in Massachusetts are committed to providing reliable and affordable energy, while protecting the environment and with minimal disruption to consumer choice. As the state pursues its work on the 2030 CEP, APGA requests consideration of the unique operating circumstances of Massachusetts’ public gas utilities and encourages the continued utilization of their valuable infrastructure and experienced workforce in achieving the state’s clean energy goals.

Respectfully submitted,



Dave Schryver  
President & CEO  
American Public Gas Association

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<sup>6</sup> American Council for Energy-Efficient Economy, “How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burdens across the U.S.

# Realistic Look at Generation of Electricity

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Thank you for this opportunity to comment on the Clean Energy and Climate Plan for 2030. We applaud the goals of the plan to reduce our green house gas emissions by 4.2 MMTCO<sub>2</sub>e over the next 10 years. However, we believe that the heavy reliance on wind, solar and imported hydro from Quebec move us toward energy sources that do not meet some basic requirements for a reliable energy grid. We propose a closer look at a highly efficient, reliable, and safe energy source that meets the stated goals: nuclear power, especially modern Generation IV reactors.

As stated in the CLEAN ENERGY AND CLIMATE PLAN FOR 2030, the demand for electricity in Massachusetts will double by 2050. In order to meet that demand along with the requirement that CO<sub>2</sub> emissions be reduced to zero, our energy production system must use energy that is

1. extracted from energy-dense sources;
2. converted by compact machinery;
- 3 available on-demand at full power;
4. locatable anywhere.

“Renewables” (i.e. solar, wind) will not do the job; they meet NONE of the above goals for energy.

Solar and wind are far from available on-demand. They require backup which is generally burning natural gas, releasing CO<sub>2</sub> and methane. Even using Quebec hydro power for backup is problematic because of the long transmission distance which will result in an 8%–30% power loss. Furthermore, Wind and solar require

1. Tremendous amount of land: for one gigawatt average output, a solar uses on the order of 25 sq. mi; wind 100 sq. mi. (power plant 1/3 sq. mi.)
2. Massive amounts of material
3. End of life material disposal which includes glass, silicon, steel, reinforced polymer plus large quantities of caustic, dangerous and carcinogenic materials used in their original production. (life span is much shorter than fossil fuel plants.)

A realistic solution to supply large amounts of clean electricity is to build generation IV nuclear reactors. Whereas the potential energy of gasoline is 46 megajoules per kilogram, for uranium it's 76,000,000 megajoules per kilogram. It is unconscionable to ignore this potential because we're too scared!

Let's take a realistic look at those fears.

1. Radiation: 82% of the radiation we currently receive is from the environment with the rest being from diagnostic x-rays, cancer treatment x-rays and consumer products. In the 3-mile Island accident, a miniscule non-threatening amount of radiation was released. According to the United Nations Report, in the Chernobyl accident which released radioactive material because there was no containment dome, there were 30 worker deaths and radiation injuries to over 100 others. In the Fukushima disaster, there were **no** radiation deaths, but thousands died because they were evacuated. (see United Nations Report - [www.unsear.org](http://www.unsear.org)).
2. Waste: This is actually an argument FOR nuclear because nuclear power is the only method that sequesters its waste. Furthermore, what we consider waste now is actually partially spent fuel, and modern nuclear systems have the potential to use that fuel.
3. Nuclear proliferation: selling nuclear power plants worldwide does not require providing each nation with the technical skills and materials to build either the power plant or nuclear weapons. No nation other than the US has independently invented nuclear weapons, and nuclear power generation has never been a source for nuclear weapons.

### **Modern Nuclear**

Generation IV nuclear features small, modular reactors that can be made in a factory, one a day. They can then be put on a truck or tanker and shipped to a power plant.

One type, Molten Salt Reactors (MSR) use liquid fuel instead of solid fuel rods and were first developed at Oak Ridge National Labs in a proven working reactor that

ran from 1965-1969. MSRs are small reactors that are walk-away safe with no potential for hydrogen or steam explosions.

In addition, because of the small size and no/low risk of failure/explosion, using MSRs or other small modular reactors would make our energy system less vulnerable to large scale disruption and/or attack.

### **In Summary**

An energy portfolio based on the renewables of solar, wind, and hydroelectric is a poor solution to the growing demand on the electrical grid. The energy sources are not dense, not reliable, require considerable acreage, and have short life-spans. It is time to take a second look at nuclear capabilities and build a truly modern, safe, reliable energy generations system.

### **Primary Data Sources**

Hargraves, Robert: Thorium, Energy Cheaper than Coal,  
Martin, Richard: SUPER FUEL: Thorium, the Green Energy Source for the Future, 2012  
Cravens, Gwyneth: Power to Save the World, The Truth About Nuclear Energy, 2007  
Rhodes, Richard, ENERGY, 2018  
Tucker, William: Terrestrial Energy, 2008  
Environmental Progress, Michael Shellenberger (online, regular updates, TED Talks)  
Breakthrough Institute (online, regular updates)  
The Thorium Energy Alliance (online, regular updates, tech talk archive)  
Roadmapnowhere.com (online & downloadable pdf)  
world nuclear news (online, daily updates)  
EIA, U.S. Energy Information Administration  
IEA, International Energy Agency  
epri, Electric Power Research Institute  
NREL (National Renewable Energy Laboratory)  
United Nations Scientific Committee on the Effects of Atomic Radiation, [www.unscear.org](http://www.unscear.org)

Carolyn McCreary, PhD, Ayer  
Carole Tillis, Ayer  
Rita Madilind, Westford  
Fran Morong, Shirley  
Martha Childs, Littleton

Larry Kaylor, Westford  
Lynda Kaylor, Westford  
Robert Williams, Ayer  
Susan Tordella-Williams, Ayer  
Erin Hollywood, Sterling  
Tom Hollywood, Sterling  
Kevin Blais, Westford  
Jan Duston, Devens  
Bill Duston, Devens  
Rick Gentilman, Acton



# General Comment on the 2030 CECP

HeatSmart Alliance

Contact: Bob Zogg, Elected Facilitator, [info@heatsmartalliance.org](mailto:info@heatsmartalliance.org)

March 19, 2021

## Executive Summary

The [HeatSmart Alliance](https://www.heatsmartalliance.org) applauds the Baker-Polito administration and the EEA for both acknowledging the climate crisis and establishing greenhouse gas (GHG) reduction targets for the next ten years that will set us on a course to net zero by 2050. This General Comment on the interim 2030 Clean Energy and Climate Plan focuses on the Building Sectors portion of the plan.

We recommend the following changes and enhancements to the Building Sectors chapter of the 2030 plan:

- **B2 Strategy Actions - work with Mass Save on a holistic approach to incentives for thermal enclosure upgrades and electrification with heat pumps:** Mass Save should take a holistic approach that includes incentives for more aggressive thermal enclosure improvements because there is strong interplay between heat pump sizing and heating load. Building envelope improvements lower equipment costs in many cases, and also reduce energy demand throughout the heating and cooling seasons. The action should be expanded to include provisions for communities with municipal light plants (MLPs) that do not participate in Mass Save.
- **B2 Strategy Actions - involve HVAC installers as critical stakeholders:** The listed actions omit any mention or involvement of HVAC installers (apart from workforce training). Installers are key stakeholders, especially in the residential market, and the CECP should engage them directly to accelerate the adoption of heat pumps.
- **B2 Strategy Actions - add an action to rigorously collect energy use data:** Widespread, systematic tracking of energy used for heating, especially fuel oil and propane, will be essential to measuring program effectiveness and establishing a feedback loop for the programs. At least one of the strategy actions should explicitly prioritize data collection and measurement.
- **Strategy B2 - allow flexibility on how fossil-fuel displacement is achieved:** It is our understanding, from private communication with EEA, that the target GHG emissions reduction from Thermal Electrification (Table 4) assumes a large number of 100% heating electrification conversions. We encourage the EEA to consider the opportunity to accelerate heat pump adoption by accommodating dual-fuel systems, allowing a small amount of combusted-fuel use in some existing homes during peak hours.
- **Strategy B3 - address heat pump operating cost disadvantage versus natural gas:** We believe the disparity between the operating cost using gas heating versus heat

pumps is not sufficiently recognized in either the CECP or the Building Technical Report, and that reducing or eliminating this disparity must be a key part of the strategy.

- **Strategy B3 - support workforce transition from the fossil-fuel industry to the clean energy economy:** The CECP should support a smooth transition of workers to accelerate the transition and minimize economic hardships.

**General Request:** we recommend that the 2030 CECP provide more detail on the assumptions underlying the GHG emissions reductions listed in Table 4, p.29, via direct inclusion, references or supporting documents.

## **Response to Building Sectors Chapter**

This section of our response supports the high-level points made in the Executive Summary.

### **B2 Strategy Actions - work with Mass Save to develop a more holistic approach that combines incentives for building efficiency and heat pumps:**

The second bullet point in the plan's B2 Strategy Actions breakout box, p.31, states "*DOER will work to increase electrification through Mass Save programs through air source and ground source heat pump incentives and consumer education in 2022-2024.*" Proper sizing of heat pumps is more sensitive to building heat loss than for conventional heating systems. Therefore, building envelope measures should be taken before or in conjunction with designing a heat pump solution. The B2 Strategy Actions only mentions building envelope measures in the third bullet, in connection with renters and homeowners in EJ communities. We urge modifying the second bullet to encompass a more holistic approach that incentivizes more aggressive thermal enclosure upgrades than Mass Save has traditionally supported and heating electrification for all constituencies.

### **B2 Strategy Actions - involve HVAC installers as critical stakeholders**

The listed actions omit any mention or involvement of HVAC installers who are especially critical in the residential market. HVAC installers can both benefit from and impede heat pump adoptions. In our experience, many installers are reluctant to recommend heat pumps. Even installers who have had more experience with heat pumps tend to discourage their use when outdoor temperatures go below freezing. In many homes, this results in at most 50% displacement of combusted-fuel use for heating when in fact the installed heat pump would be capable of operating at below-freezing temperatures and displacing 80% or more of the combusted-fuel use. We believe installers take this overly cautious position out of concern that they will receive customer callbacks and complaints after heat pump installation if the system does not provide adequate heat on colder days. As stated in the interim plan, few installers are comfortable proposing 100% heat pump solutions.

This goes beyond certification or workforce training, which is addressed in the last bullet of the B2 Strategy Actions breakout box. These strategy actions should explicitly support establishment of policies, installer outreach and education programs, and incentives that

encourage installers to propose and set up heat pump systems that displace 80% or more of combusted-fuel use. The DOER's Home MVP pilot program is a possible model for involving installers, encouraging a single point of contact for homeowners, and taking a holistic approach to incentivizing thermal enclosure improvements and heat pumps based on site energy savings.

## **B2 Strategy Actions - add an action to rigorously collect energy use data**

While electricity and natural gas are provided by public utilities, delivered fuels (fuel oil and propane) are provided by private companies, which raises a huge barrier to collecting "real-time" data on delivered fuel use by individual buildings. Such data will be essential to tracking overall progress toward emissions goals and, more importantly, measuring the effectiveness of programs that are intended to implement these strategies. Frequent, accurate measurements of overall progress and program effectiveness are necessary for establishing rapid feedback loops, and these are essential for achieving mandated emissions reductions in the relatively short time available between the present and 2030.

At least one of the strategy actions should explicitly address this data collection and measurement challenge, and result in a new program of mandatory or widespread voluntary data collection of energy use, including delivered fuels, by individual buildings. Data collection and measurement may be implied by the strategy actions as written, but are not explicitly mentioned.

## **Strategy B2 - allow flexibility on how fossil-fuel displacement is achieved**

The CECP should consider a 'thermal enclosure first' strategy. While many building improvements may be initiated by consumers with combustion equipment nearing or at end of life, this waiting game sacrifices major opportunities for emissions reductions in the preceding years. Significant emissions reductions can be achieved by reducing demand through improvements in thermal enclosures. Improvements in thermal enclosures should be a priority in all commercial and residential buildings where deficiencies exist relative to benchmarks. With the thermal enclosure improved first, systems can be designed, and heat pumps can be sized for optimal performance, decreasing both first and operational costs. To realize deeper heating load reductions requires more up-front investment in the thermal enclosure, but delivers greater long-term societal benefit. Therefore, appropriate financing mechanisms should be considered for measures that go substantially beyond conventional weatherization to deliver deeper energy savings. Heating load minimization can reduce demands on generation, storage, transmission and distribution, and will optimize comfort, resiliency and energy costs.

**Some Combustion Heating:** It is our understanding, from private communication with EEA, that the target GHG emissions reduction from Thermal Electrification (Table 4) assumes a large number of 100% heating electrification conversions. We encourage the EEA to consider the opportunity to accelerate heat pump adoption by accommodating dual-fuel systems, allowing a small amount of combusted-fuel use in some existing homes. Combusted-fuel heating could be valuable for use in homes that are difficult and/or expensive to retrofit to 100% electric heating,



for demand-response capability, occasional very-low-temperature weather, and islanded resiliency in event of grid unavailability.

**Optimize Time to Delivered Emissions Reduction:** The ‘electrification’ of 1 million existing homes by 2030 requires a rapid transformation that is best initiated as soon as possible. Consider accelerating to the end of 2021 strategy actions that involve eliminating incentives for replacement of combustion heating equipment. Make incentives for thermal enclosure improvement more attractive when combined with heat pump retrofit, and provide appropriate financing. The strategy actions should support:

- Educating the public on the implications of the CECP, so they can begin considering and planning their retrofit projects.
- Skilled technical assistance to homeowners to facilitate education and project planning.
- Incentives for homeowners to be interviewed and share energy-use bills.
- Post-project review and analysis, especially in early stages of the retrofit program to optimize the program going forward.
- Publishing energy and GHG reduction data on an annual basis to track performance against targets, and taking corrective action when data indicate adjustments be made.

### **B3 Strategy - address heat pump operating cost disadvantage versus natural gas**

Strategy B3 is key to each of the building sector GHG emissions reductions targets. B3 recognizes the “immense challenge in terms of scale and logistics” for the building sector and notes there is “not a one-size-fits-all solution.” We agree--the building sector is the most challenging component of the state’s GHG emissions reduction targets both for 2030 and ultimately to achieve net zero by 2050. Also, as recognized by the CECP, the Clean Heat Commission must be an interagency task force with overall oversight for the building sector to ensure a comprehensive policy that avoids siloed initiatives. Because of the urgency of the situation, we recommend the dates proposed in B3 be accelerated and that multiple ideas be piloted as quickly as possible to determine the most effective. Example pilot programs we found promising were the Home MVP program and the MassCEC HeatSmart initiative.

Finally, neither the CECP nor the Building Technical Report sufficiently address the current disparity between the operating cost using gas heating versus heat pumps. The solution may include bundling incentives for heat pumps and thermal enclosure upgrades sufficient to offset the higher operational cost of heat pumps compared to natural gas.

### **B3 Strategy - support workforce transition from the fossil-fuel industry to the clean energy economy**

In 2019, the industry supplying fossil fuels to buildings supported over 11,000 jobs in Massachusetts (from U.S. Energy and Employment Report 2019 - *Massachusetts Energy and Employment--2019*). The state will achieve its decarbonization goals faster, easier, and with less economic disruption if the state facilitates the transition of these workers to jobs that support the

state's goals. We recommend including in the CECP approaches to facilitate this transition. One example of such an approach is the GeoMicroDistrict concept developed by the Home Energy Efficiency Team (HEET) (see <https://heet.org/geomicrodistrict/>). This approach transitions natural-gas delivery companies from delivering natural gas to delivering thermal energy extracted from the ground. Heat pumps located in homes and buildings would extract heat from (or reject heat to) the thermal energy loop to provide heating (or cooling) services.

### **General Request: provide more detail on the underlying assumptions for the GHG emissions targets**

For the Buildings Sector, the only information provided in the CECP for the GHG emissions reduction is Table 4, which provides Metrics and target GHG emissions reduction for four building subsectors. However, this data is not sufficient to understand how the Metrics achieve the target reductions. We highly recommend adding this information to the CECP by inclusion or reference to other documents. Underlying information that would be helpful includes:

- Do the metrics and emission reduction targets in the CECP align with any of the pathways discussed in the Building Sector Technical report of the 2050 Roadmap?
- How clean is electricity in 2030?
- For the one million households retrofit to electric heating, what is the breakdown of heating fuels used prior to the retrofit? The same question for the 300-400 million square feet of commercial real estate retrofit to electric heating.
- What percent of combusted-fuel heating is displaced in the residential and commercial retrofits to electric heating?
- What level of thermal enclosure upgrades is assumed for the residential and commercial retrofits to electric heating?
- What are the underlying assumptions leading to the GHG emissions reduction from decarbonized fuel blending?

### **About the HeatSmart Alliance**

The HeatSmart Alliance is a group of volunteers with members and associates from 21 communities in the Boston metrowest area. Our mission is to reduce greenhouse gas emissions by accelerating adoption of energy-efficient heat pumps in Massachusetts homes and buildings. We primarily work at the grassroots level to achieve this mission.

Our experience is primarily with single-family homes. A number of us are veterans of the MassCEC HeatSmart initiative and we also have members who are knowledgeable in the areas of retrofits, heat-pump technology, community outreach, and overall approaches to reducing greenhouse gas emissions.

Learn more about the Alliance at <https://heatsmartalliance.org>

March 19, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs (EEA)  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
Electronic portal: <https://www.mass.gov/forms/public-feedback-on-2030-cecp>  
via email to: [gwsa@mass.gov](mailto:gwsa@mass.gov)

**Subject: Comments on the 2030 Clean Energy and Climate Plan**

Dear Governor Baker, Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

The climate crisis is increasingly severe, and Massachusetts must be at the forefront of addressing it. We are in danger from flooding, severe storms, rising sea levels, and other dangers to our health and economy from a worsening climate.

Governor Baker's decision that the state will achieve net zero emissions by 2050 is an important goal, and now the shorter-term actions of the administration must be designed to get us to that goal. In addition, our cumulative emissions through 2050 must also be minimized, if our state is to be part of attaining the Intergovernmental Panel on Climate Change (IPCC) target of holding emissions to a level which will keep global temperatures from rising more than 1.5 degrees centigrade.

Climate XChange is in support of most aspects of EEA's draft [Clean Energy and Climate Plan \(CECP\)](#) for 2030. However, we are also a signer on a joint letter by a number of organizations, addressing various areas in which we believe that the administration's CECP for 2030 can be improved. In the present letter we address two points which we think are critical to reaching both the 2050 goal and minimizing emissions from now through 2050:

- Cut emissions 50% by 2030
- Create a strong cap on emissions from the buildings sector, as you proposed

**Cut emissions 50% by 2030**

We strongly urge you to set the state's emissions reduction target for 2030 at 50% below their 1990 level, not the 45% currently included in the CECP. The state's emissions reduction goals must be based on science, which includes the IPCC's target to minimize global emissions cumulatively from the present to 2050, and therefore the need to reduce emissions more quickly beginning with years from now until 2030. This target requires cutting emissions at least 50% by 2030.

The administration has argued that it will cost an extra \$6 billion to get to a 50% GHG reduction in 2030. However, the draft CECP tables show that the state can get to a 45% to 48% cut in greenhouse gases by 2030 under the current plan -- which is only 2% away from 50%. The state could easily reach the extra 2% through a variety of measures put forth by advocates in our joint letter to further cut emissions from electricity, transportation, buildings, and other sectors. Further, the benefits to bolder action mean more green jobs in the state and healthier communities with cleaner air.

Moreover, we believe that while the \$6 billion is an overstatement of the cost, it is a reasonable amount for Massachusetts, given the size of the state's economy and the benefits from cutting fossil fuel use:



- Based on allocating \$6 billion over the next ten years, it's only a 3% increase (\$600 million) in the \$20 billion a year cost of energy in Massachusetts. 3% is well less than the annual fluctuations in recent years in the market price for oil and natural gas.<sup>1</sup>
- \$600 million is only 0.1% of the overall value of the state's economy per year (\$600 billion) — a tiny fraction to put into addressing the climate crisis.
- The \$6 billion cost leaves out the health benefits, jobs and other savings from cutting use of fossil fuels. For example, a [peer-reviewed study](#) of Washington State found that the health and climate benefits of reducing pollution were 2.4 times greater than the upfront cost; a similar study of Massachusetts is forthcoming from Climate XChange this Spring.

### **Create a strong cap on emissions from the buildings sector, as you proposed**

We urge you to take strong action in reducing greenhouse gas emissions and pollution originating from the buildings sector. We agree with EEA that the proposed heating fuel emissions cap (HFEC), included as Strategy B3 in table 4 on page 29, and discussed further on pages 32 to 33, is essential to reaching the 9.4 MMTCO<sub>2</sub>e cut in emissions from buildings by 2030 contained in the draft CECP. This is the largest cut by sector, compared to the 7.8 to 8.1 from transportation and 4.2 to 5.1 from electricity from 2017 to 2030.

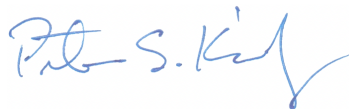
Along with RGGI in electricity and the Transportation and Climate Initiative Program, the HFEC would bring market-based climate policy to all major sectors of the economy. DOER must not delay in convening the Commission on Clean Heat and Task Force on Clean Heat, and must endow these bodies with a strong mandate to implement the cap beginning in 2023, with declining cap levels over time to reach the 9.4 MMTCO<sub>2</sub>e reduction by 2030.

The buildings-sector emissions are some of the hardest ones to reduce, and require swift and decisive action now so that new construction in Massachusetts will benefit from decreased costs of energy, and our communities can see reductions in localized air pollution caused by the burning of fossil fuels.

In addition, the revenues generated through the sale of emissions permits must be used equitably to protect low-income people and environmental justice communities, through both rebates and assistance in making their homes more energy efficient and converting their heating to non-fossil fuel systems.

Thank you for considering our comments. We appreciate the extensive work that the administration has put into the draft CECP, and look forward to a final CECP that is deserving of the people of our great state.

Sincerely,



Peter Kirby  
Board Chair and Acting Executive Director

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<sup>1</sup> From 2000 to 2020, the [annual price for gasoline](#) went up or down by an average of 14.0% per year (table EMM\_EPMD\_PTE\_NUS\_DPG), while the [average price for residential natural gas](#) varied by 8.9% per year (table N3010US3), according to the U.S. Energy Information Administration.



Environment,  
Energy and  
Open Space



City of Boston  
Mayor Martin J. Walsh

March 19, 2021

Kathleen Theoharides, Secretary  
Massachusetts Executive Office of Energy and Environment  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Re: Written Comments of the City of Boston in Response to the Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides,

The City of Boston (“City” or “Boston”) is committed to achieving carbon neutrality by 2050, in alignment with Governor Baker’s updated 2050 target. We are pleased to share our comments on the draft 2030 Clean Energy and Climate Plan (CECP), and look forward to working with your team to address the challenges and opportunities of decarbonization in the Commonwealth of Massachusetts (“Commonwealth”).

We were pleased to note the proposed adoption of key climate strategies, including the following:

- near-term development of a Passive House-level stretch energy code,
- elimination of Mass Save incentives for fossil fuel equipment,
- development of new caps on heating fuels,
- new air-source heat pump certification and training programs,
- new rate class for electricity for electric vehicles,
- prioritization of communities which are overburdened by pollution and underserved by transportation for allocation of investments from the Transportation and Climate Initiative (“TCI”),
- expansion of the MOR-EV program to serve low- and moderate-income residents,
- coordinated offshore wind development,
- solar deployment at scale,
- adoption of GWSA compliance as a key consideration in grid modernization and DPU planning process,
- regulation of HFC sales, strengthening regulation of SF6 leakage rates.

**CITY of BOSTON**

The building sector accounts for 70 percent of Boston current emissions, and the city is expected to add over 120 million square feet of new construction by 2050. We were pleased to note that the draft plan proposes that the Department of Energy Resources develop a Passive-House level stretch energy code for adoption by 2022, and to be phased into the statewide energy code by 2028. In previous letters and testimony before the Board of Building Regulations and Standards, the City has expressed its strong support for the development of a net-zero stretch energy code, and we urge that this key feature be included in the final plan, and that the proposed timeline be maintained. Regarding Strategy B2 on retrofits, in addition to air source heat pump certification, we encourage the exploration of green certification programs for contracting and other key professions in energy efficiency and electrification trades. We also recommend strengthening MassSave to accelerate phase-out of fossil fuel-based equipment at the point of replacement, including legislative reform to revise the cost-effectiveness test, and consider the cost of carbon and avoided long-term retrofit and early retirement costs. We also support the development of additional financing mechanisms, including a state-level climate bank to leverage public funding to drive private investment, and offer our support and collaboration in this effort. Finally, we look forward to participating in the development of the proposed clean heating cap, and offer all existing datasets and analysis carried out by the City in support of the initiative. We fully support the adoption of a clean heating cap by 2023, and further recommend that the final CECP include a commitment to develop fuel-specific targets, a detailed timeline for program development and implementation, further clarification on task force membership and scope (including financing and legal barriers to decarbonization in existing funding mechanisms), prioritization of fuel oil phase-out, and accelerated implementation in Environmental Justice Populations.

Three-quarters of Boston's transportation emissions come from travel to and from the metro area, and we welcome the commitment to prioritize underserved communities in the allocation of TCI investments. We hope that the final CECP includes a recognition of public transportation as a greener, more sustainable solution that needs significant investment and expansion, including bus priority, light and inter-city rail, and ferry service to maintain and grow post-pandemic ridership; we look forward to building on our existing collaborations to expand bus rapid transit and increase service on the Fairmount corridor to achieve our vision of an accessible, reliable and affordable public transit system. We also encourage the consideration of road or travel pricing mechanisms, and steps to reform tax incentives or price signals that encourage single occupancy vehicles and car-based commutes, in support of the 15% reduction goal per employer. We were also pleased to see the inclusion of important strategies to support transportation electrification, including the development of a dedicated electric rate class and demand response for electric vehicles and refocusing MOR-EV on low and moderate income users. In addition to proposed measures, we would encourage the inclusion of e-bikes and e-cargo bikes in EV incentive programs, rulemaking for the used EV market, expanded auto

dealership engagement and education, incentives for ride-hailing and urban delivery fleet electrification, and exploration of a state EV charging program to ensure equitable deployment of charging infrastructure across the Commonwealth.

The Commonwealth's leadership in setting clean energy standards has facilitated municipal decarbonization. We applaud the commitment to expanding clean energy resources to meet increased electricity demands due to building and transportation electrification, and to incorporating GWSA into distribution-level policy considerations. The City has also enthusiastically supported the efforts of the Baker/Polito administration through the Department of Energy Resources to continue to advance the development of solar generation resources and enhance existing opportunities to deliver the benefits of solar resources to the Commonwealth's low-income customers. In addition to the strategies laid out in the CECF, we hope to see expanded support for resilient and decarbonized microgrids and local distributed energy resources. We also urge the adoption of load management and load flexibility strategies in order to manage variability, optimize reliability, and minimize transmission and distribution (T&D) and capacity investments; strategies would include demand response, time-varying rates, and mass deployment of existing consumer technologies (consumer-facing advanced metering infrastructure (AMI), behind-the-meter battery storage, electric vehicles, smart thermostats, smart water heaters and other appliances). These strategies may build on the National Grid pilot carried out in Worcester, and learn from deployments in other states, including the recently approved \$800 million PSE&G plan to deploy smart meters to all 2.3 million of their New Jersey customers. The City is prepared to work with the Department of Public Utilities to support the successful deployment of consumer-facing AMI, time-of-use rates and implementation of other load management strategies.

In addition to the building, transportation and energy measures, we would also urge the Commonwealth to consider developing a consumption emissions model to support source reduction, waste sector decarbonization and emergence of the circular economy. We also encourage the adoption of policies to modernize natural gas infrastructure and protect urban canopies<sup>1</sup>, which are essential to countering the urban heat island effect, particularly in neighborhoods threatened by extreme heat. Finally, the City also supports the development of a framework to encourage demand response among commercial natural gas users, for instance by drawing from on-site energy storage systems.

In implementing the 2008 Global Warming Solutions Act, Massachusetts became a nationwide leader on climate. The Commonwealth has an opportunity yet again to take ambitious and necessary action to act on climate and protect our communities. Given the imperative to take bold action to combat climate change, we believe that state leadership is needed now more than

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<sup>1</sup> See H. 2828, An Act to Modernize Our Natural Gas Infrastructure/Reduce Gas Leaks.

ever. Boston will continue to partner with the Commonwealth's agencies towards our shared goals of carbon neutrality and climate readiness.

Sincerely,

A handwritten signature in black ink, appearing to read 'Chris', with a long horizontal stroke extending to the right.

Christopher Cook  
Chief of Environment, Energy and Open Space  
City of Boston



Massachusetts Executive Office of Energy and Environmental Affairs

CLEAN ENERGY AND CLIMATE PLAN 2030 COMMENTS

COMMENTS OF DALKIA AEGIS/EDF GROUP

Dalkia Aegis/ EDF Group hereby submits its comments to Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs regarding the above captioned state plan.

Aegis appreciates the State's comprehensive consideration of energy reduction and energy efficiency in its Clean Energy and Climate Plan for 2030. We urge you to continue support for financial incentives for HIGHLY EFFICIENT fossil fuel burning technologies, such as Combined Heat and Power.

We are Massachusetts-based manufacturers and installers of Combined Heat and Power systems and are writing in support of the state's continuing support of **Combined Heat and Power (CHP) technology** within its Clean Energy Climate Plan, because of its proven high efficiency use of natural gas. Combined Heat and Power (CHP) is the simultaneous on-site generation of BOTH Heat and Electricity from a single fuel source.

Aegis Energy has been in business for 35+ years in Massachusetts and has successfully installed 1500+ CHP systems throughout the Northeast, Mid-Atlantic, and California. Aegis employs 100+ people in Massachusetts and recently undertook a major redevelopment of an abandoned paper mill to move its expanding operations. Clearly, we are heavily invested in the Commonwealth. We would hope that the State of Massachusetts will take our comments seriously since the contemplated elimination of incentives for our technology will negatively impact our business operations and employees here in the state. We believe that Massachusetts wants to support its manufacturing businesses.

Combined Heat and Power (CHP) is recognized as a *clean energy* technology by US EPA<sup>1</sup> and enjoys widespread support from EPA, US DOE, 2012 Presidential Executive Order No. 13624<sup>2</sup> and numerous states throughout the country. States such as MA, NJ and MD, and even California provide incentives for installing on-site Combined Heat and Power systems. CHP can play a significant role in decarbonizing the electricity, buildings, and industrial sectors. CHP systems require less fuel inputs for the same energy outputs, have a high-capacity factor allowing them to displace high-emitting marginal grid resources, and can enable the addition of intermittent renewable resources to the grid by providing a consistent source of power.<sup>3</sup> For these reasons, incentives for CHP, utilizing natural gas, should not be discontinued as contemplated in the Plan 2030. This technology will continue to help reduce carbon emissions over the next decade while the central grid slowly evolves to reach zero carbon. There are many estimates

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<sup>1</sup> <https://www.epa.gov/chp/what-chp>

<sup>2</sup> <https://obamawhitehouse.archives.gov/the-press-office/2012/08/30/executive-order-accelerating-investment-industrial-energy-efficiency>

<sup>3</sup> Combined Heat and Power Alliance, Reducing Emissions and Improving Resilience, [chpalliance.org](http://chpalliance.org)

expecting a zero-carbon grid to be realized no sooner than 2040 or 2050. In the meantime, CHP can help assure carbon reduction and the most efficient use of natural gas.

The demonstrated public and utility support for CHP technology comes from its myriad benefits, which include:

1. Highly efficient use of natural gas 85% versus central power plant of 33%. (While natural gas is being used as a “bridge fuel” over the coming decades, CHP essentially uses 85% of each molecule of natural gas in its simultaneous production of electricity and thermal energy.) Such efficiency implies an overall reduction in the amount of gas used when compared to the SEPARATE generation of heat and electricity. Likewise, on site generation of electricity results in reduction of peak demand and thus overall electricity reduction.
2. Reduced pollutant and CO2 emissions when compared with separate generation of heat and electricity.<sup>4</sup> (50% less)
3. Reduced energy costs
4. Reduced loads and peak loads on central power grid.
5. Resiliency in the wake of power outages. CHP technology can be configured such that it also provides standby power during a grid outage.
6. Reduces utility’s need to invest in capital intensive generating capacity
7. Reduces utility’s need to invest in distribution lines
8. Integrates well with micro-grids or other renewable energy sources.

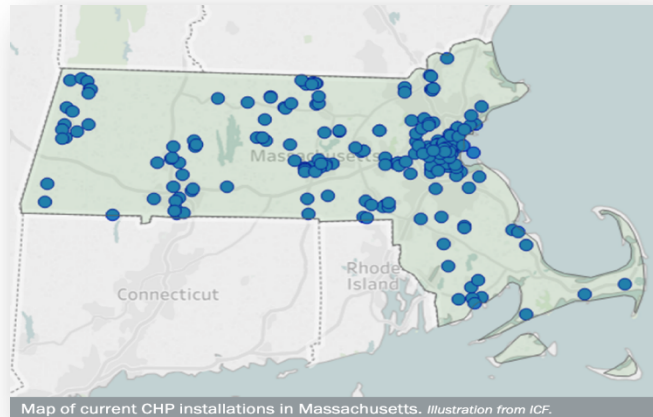
In addition to the environmental, efficiency, and cost benefits noted above, a CHP installation has many benefits for the State of Massachusetts, which we hope you will consider when evaluating these comments. CHP installations can help keep electric rates in check over the long run as utilities do not have to build additional capital-intensive generating capacity and distribution lines, the costs for which are passed down to commercial and residential customers, thus contributing to stable utility rates for a business-friendly environment. Likewise, these installations employ local skilled trades labor both for installations and on-going maintenance of these systems, which contributes to local employment. Supplies for the installations and maintenance are sourced from local businesses, as well.

Combined Heat and Power technology has already been widely adapted across Massachusetts by non-profits, health care, municipalities, industry, and publicly & privately-owned multi-family buildings, thereby already making it a **relevant technology** in the state’s portfolio and efforts to reduce GHG emissions. (See map below)<sup>5</sup>

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<sup>4</sup> <https://www.epa.gov/chp/chp-benefits>

<sup>5</sup> <https://betterbuildingssolutioncenter.energy.gov/sites/default/files/tools/Massachusetts.pdf>



The CHP component of the state/utility incentives provides a suite of benefits to Massachusetts residents and therefore should continue to be incentivized until the overall grid achieves zero carbon output.

- Reduction in criteria pollutants
- Reduction in CO<sub>2</sub> (greenhouse gas) emissions
- Power and Thermal Energy **resiliency** for appropriately designed CHP systems
- Economic multiplier benefits (importing less energy) keeping dollars in MA economy
- local job creation, direct industry jobs, service jobs
- Critical infrastructure support including healthcare, hospitals, research, pharmaceuticals, key supply chain products and services.
- energy and capacity savings
- reduction in utility transmission and distribution (T&D) capital costs benefiting ratepayers
- reduction in utility T&D operating and maintenance costs benefiting ratepayers
- reduction in local T&D congestion, enhancing the network reliability

Lee Vardakas

President

Dalkia Aegis/ EDF Group

# Holland & Knight

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Holland & Knight LLP | [www.hklaw.com](http://www.hklaw.com)

Mark C. Kalpin  
Equity Partner  
+1 617-305-2076  
[Mark.Kalpin@hklaw.com](mailto:Mark.Kalpin@hklaw.com)

Date: March 19, 2021

To: The Massachusetts Executive Office of Energy and Environmental Affairs

From: Mark C. Kalpin  
Maria de la Motte

Cc: Gretchen May, President and Executive Director  
Longwood Medical Energy Collaborative, Inc.

Re: Comments on the Massachusetts Clean Energy and Climate Plan for 2030

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On behalf of the Longwood Medical Energy Collaborative, Inc. (“LMEC”), we are submitting comments on the interim draft Massachusetts Clean Energy and Climate Plan for 2030 (the “CECP”), which was issued by the Executive Office of Energy and Environmental Affairs (“EEA”) on December 30, 2020. As an organization comprised of healthcare and biomedical institutions, LMEC shares the Commonwealth’s commitment to both reduce greenhouse gas (“GHG”) emissions and address the impacts of climate change. Given the focus of its member institutions, LMEC’s comments relate primarily to Chapter 3 of the CECP, “Transforming Our Buildings,” in an effort to provide further information on some of the unique challenges and competing priorities that healthcare and biomedical institutions currently face as they continue their long-standing efforts to achieve “Net Zero” GHG emissions.

## **Background**

LMEC was formed to coordinate energy planning efforts on behalf of its six member institutions: Beth Israel Deaconess Medical Center, Inc., Brigham and Women’s Hospital, Inc., The Children’s Hospital Corporation, Dana-Farber Cancer Institute, Inc., Joslin Diabetes Center, Inc., and The President and Fellows of Harvard College (the “Institutions”). These Institutions operate world-class healthcare, educational and medical research facilities in the Longwood Medical Area of Boston. Together, LMEC’s member Institutions provide the Commonwealth and New England with broad access to top quality, affordable healthcare, while also conducting innovative research that drives economic and scientific gains for the Commonwealth.

Given their patient care, teaching and research missions, the Institutions care deeply about reducing energy usage and lowering their respective GHG emissions, particularly understanding that residents in disadvantaged communities are disproportionately affected by the health impacts of climate change. In this regard, the Institutions voluntarily have implemented numerous energy

Anchorage | Atlanta | Austin | Boston | Charlotte | Chicago | Dallas | Denver | Fort Lauderdale | Houston | Jacksonville  
Lakeland | Los Angeles | Miami | New York | Orlando | Philadelphia | Portland | San Francisco | Stamford | Tallahassee | Tampa  
Tysons | Washington, D.C. | West Palm Beach

Bogotá | London | Mexico City  
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efficiency, reduction and conservations efforts over the last several decades – efforts which commenced long before the Commonwealth’s passage of the Global Warming Solutions Act. As part of these efforts, each Institution obtains a substantial portion of its electricity, chilled water and steam requirements from the Medical Area Total Energy Plant (“MATEP”), a highly efficient tri-generation facility that also is located in the Longwood Medical Area.

LMEC and its member Institutions wholeheartedly support the Commonwealth’s ongoing efforts to reduce GHG emissions and achieve its “Net Zero” goal. In outlining the strategies and steps that are necessary to achieve this “Net Zero” goal, LMEC appreciates that the CECP acknowledges some of the specific challenges facing existing buildings, including the long life of equipment and building envelopes. As discussed below, these challenges are exacerbated by the unique circumstances associated with the operation of world-class healthcare and medical research facilities, including the requirement to provide innovative and affordable healthcare to patients on a 24/7/365 basis.

### **Unique Challenges Faced by Healthcare and Biomedical Institutions**

Under normal conditions, the operation of each Institution’s facilities is highly complex and choreographed – emergency rooms, operating rooms, patient care spaces, and biomedical research labs, each of which contains the latest medical equipment and technologies, operate on a round-the-clock basis. These operations result in higher rates of energy usage, which increases the “energy density” of each facility when measured on a square foot basis. Given the critical services that each Institution provides, the need for a reliable and redundant energy supply is essential, and the opportunities to temporarily decommission and retrofit existing space is limited.

Post-COVID-19 operating conditions further complicate this energy picture. For example, new ASHRAE and CDC guidelines that are applicable to healthcare facilities are expected to increase energy usage by requiring increased air changes in buildings, increased air filtration, a higher percentage of outside air and bypass of air recovery systems, longer air handling run times, and extended hours of normal operation (to accommodate social distancing guidelines). These new guidelines will have a significant impact on existing equipment and require extensive engineering, time and capital requirements to comply. In addition, the new guidelines pose an inherent conflict between infection control requirements and energy reduction goals.

A further challenge facing LMEC’s member Institutions is that they receive electricity, chilled water and steam from the MATEP plant, a highly efficient tri-generation district energy facility. As noted in the CECP, while district energy plants may offer opportunities for commercial and industrial properties to reduce their GHG emissions, the use of these plants may also present additional challenges. Both of these statements are especially true in the context of each of the Institutions.

### **Comments and Suggestions for the CECP**

LMEC understands and agrees that to achieve Net Zero by 2050, the number of buildings using natural gas, fuel oil and propane must decline, and that widespread envelope retrofits will be necessary. However, LMEC believes for the reasons stated above that the CECP (and any actions undertaken in furtherance of the CECP) needs to more clearly differentiate between the various

building types and uses that are prevalent throughout the Commonwealth, address the specific challenges that each building type and use may face, and then develop realistic and achievable emission reduction requirements for each building type and use. In the case of the Institutions, this analysis would consider the limited ability of healthcare facilities to interrupt essential patient services and decommission substantial portions of their facilities to improve the efficiency of building envelopes, the limited availability of space in the Longwood Medical Area to house new energy supply equipment, and the Institutions' inability to dramatically alter their energy supply profiles given their supply of electricity, chilled water and steam under long-term contract from the independent MATEP facility.

LMEC also believes that the actions to be taken by the proposed Commission and Task Force on Clean Heat (the "Task Force"), which include establishing performance and reporting standards and requirements for large, commercial, and industrial buildings, should be coordinated with the efforts that currently are being taken by numerous municipalities through-out the Commonwealth to address similar issues. In this regard, LMEC notes that the City of Boston is in the process of revising its Building Energy Reporting and Disclosure Ordinance ("BERDO") to include performance standards and requirements, and that LMEC is cooperatively working with the City to address the same types of challenges and concerns that are highlighted above.

### **Conclusion**

LMEC applauds EEA's efforts to ensure the Commonwealth will achieve its Net Zero climate goals, which include reducing emissions of GHG associated with the operation of healthcare and biomedical research facilities. LMEC looks forward to working with EEA to address the unique challenges that the Institutions face in reaching the Commonwealth's Net Zero goal, and welcomes the opportunity to engage in further dialogue and cooperation with the Baker-Polito Administration as the Commonwealth continues to lead on addressing climate change.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark C. Kalpin", with a long horizontal flourish extending to the right.

Mark C. Kalpin

# UTILITY WORKERS UNION OF AMERICA

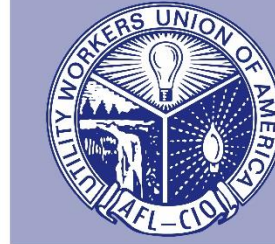
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March 22, 2021

Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Ste. 900  
Boston, MA 02114  
VIA: *Mass.gov Online Portal*

*Re: Interim Clean Energy and Climate Plan for 2030 (2030 CECP)  
Comment from Utility Workers Union of America, AFL-CIO*

Secretary Theoharides:

We welcome the opportunity to comment on the EEA's Interim Clean Energy and Climate Plan for 2030 (2030 CECP). The Utility Workers Union of America represents around 50,000 workers in the electric, gas and water utility sectors. Our members maintain and operate utility infrastructure throughout the United States. Their work places our members at the center of America's energy systems – at the point of consumption in a gas or electric appliance and upstream all along the pipes and wires to the powerplants and industrial processes.

The UWUA supports reducing carbon emissions as our union is made up of technically minded people whose everyday work involves thinking like an engineer, a mechanic and a scientist. We clearly understand the need for Massachusetts to manage its carbon emissions, that global climate change is real and that it is affecting our great Commonwealth.

The members we serve take pride in the work they do, whether it's installing new services or in repairing leaks and maintaining existing service to improve public safety and protect the environment. Our members believe that natural gas is, in fact, a cleaner and cheaper option for both residential and business customers. That this view is shared by their communities is reflected in the fact that requests for new natural gas service increase every year.

However, we have concerns about the implementation of some of the policies enumerated in the 2030 CECP that would directly affect our livelihoods and the customers we serve. Further, these initiatives will also have a bearing on the safety and reliability of the energy delivery systems which we build and maintain.

We disagree with the notion that in order for Massachusetts to effectively manage its carbon emissions, highly skilled, good paying, union jobs must be traded for much lower quality jobs in pursuit of solutions that are economically, socially, and even physically unrealistic. That avenue creates a false choice which does little to ensure that Massachusetts manages its energy transition in a way that benefits all workers and communities.

We see serious issues in undertaking a one-to-one conversion of all gas usages to electric. Affordability, for one, particularly in neighborhoods with older homes, rental properties and low-income populations. The costs of conversion – while not inconsiderable for any end user – could fall disproportionately on those customers least able to afford the change, or the resulting energy costs.

Our members in the electric sector who serve distribution customers are also concerned about the impact of the additional electric load that would be necessary to achieve full electrification, particularly in less densely populated areas where upgrades to infrastructure would require years and only add to the electric distribution bills of the state's electric customers.

We believe that climate goals, particularly with respect to the housing sector, should not be aimed for solely from the standpoint of a literal, one hundred percent electrification of the state's energy systems. The solutions for the housing sector, particularly the existing housing sector, should be discussed in a manner which encourages numerous technologies – as may be appropriate to a given region, town, or even individual building to reduce building emissions and energy consumption.

Limiting energy choice to just electricity is bad for both the economy and community resilience. Relying on a single energy delivery system eliminates consumer choice, suppresses innovation and competition, and could reduce reliability. In addition, limiting to a single energy delivery system unnecessarily increases vulnerability to extreme weather events and disasters caused by climate change.

Natural gas is a very affordable source of energy for residents in Massachusetts, which is particularly important during the region's cold winters. In September 2019, the average price of residential natural gas in Massachusetts was about eight percent below the national average while the price of residential electricity was about 67 percent above the national average.<sup>1</sup> Eliminating new residential natural gas could lead to much higher costs for heat for working families. Estimates are that it costs \$1,391 to heat a Northeastern home in winter with electricity and only \$712 with natural gas.

Further, it is axiomatic that electrification without robust energy efficiency improvements – for every individual building - does not reduce energy consumption, and in many cases results in higher energy consumption. Simply converting a building to all electric, while reducing gas usage, does not necessarily reduce energy consumption in fact, consumption is likely to increase as building envelopes fail to achieve efficiency for electric technologies.

Massachusetts is at an inflection point in the evolution of state energy policy in response to the global climate crisis. Reducing the carbon emissions of our energy systems is a goal shared by everyone, but a narrow tech-specific approach that picks preferred technologies risks setting us back in our energy goals and obstructing work to meet other goals such as affordable housing, pursuing environmental and economic justice, and maintaining the health and well-being of the state's citizens.

The core of our message is that union workers in the energy industry have skills, experience and knowledge that are crucial to addressing the challenges we all face as the infrastructure for which we are responsible evolves. Our work culture empowers workers to make the energy systems on which our economy relies safe, reliable, affordable and clean. That means a workforce that is adequately staffed, well trained, fairly compensated and has a place at the table where decisions are made.

Workforce stability to operate and maintain energy infrastructure is key to de-carbonizing our economy. We are a resource for achieving our state's environmental goals when we are engaged and valued by the process. This includes maintaining continuity in the workforce that operates and maintains our energy infrastructure.

The 2030 CECP would be improved by an explicit statement about the absolute necessity of a highly trained, highly skilled union workforce numerically large enough, possessing all of the necessary skill-sets essential to operating energy systems in accordance with requirements for safety, reliability, responsiveness, leak reduction and affordability at all times. This is a baseline requirement that should be the starting point for any discussion of Massachusetts' evolving energy systems, including the recruitment, training, and retention of workers to achieve those performance levels over the coming decades of gas system evolution.

Because jobs in the utility sector are in a mature industry that have long had higher rates of union density than the broader economy, they are generally highly skilled, well compensated, and have high road benefit packages for both healthcare and retirement. These are some of the most high-quality middle-class jobs in the state, jobs that are truly lifelong career pathways for people to follow. Further, these are both family and community-supporting jobs where these workers live and spend their paychecks, fueling the state economy. Sacrificing jobs of this quality in pursuit of goals that are difficult to the point of being unachievable is not sound public policy.

While we support de-carbonization, we do not support mandated building electrification. As workers who go into homes

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<sup>1</sup> <https://www.eia.gov/state/?sid=MA#tabs-5>



every day, we see electrification as being far more costly and orders of magnitude more physically difficult than simply modernizing gas end-uses. Strategies such as reducing building-related emissions through fixing gas leaks, replacing older gas appliances with state-of-the-art efficient gas appliances using electronic ignitions, and blending hydrogen in delivered gas fuels are examples of policy approaches that would be more effective, cost-efficient and, perhaps most importantly, realistically achievable as opposed to a full replacement of our entire gas industry and complete retrofit of every building in the state of Massachusetts.

An obvious example as to why this is so, is to simply think through the issues associated with the physical retrofit of homes with gas appliances to all electric appliances. In most cases they cannot simply be swapped out in a literal one-to-one exchange. The need to upgrade electrical panels, redo ductwork and wiring, open walls and ceiling, and remodel entire building configurations to accommodate the systems needed would be extremely expensive for all homeowners, regardless of income as well as massively, and physically, disruptive. Multiplied over millions of Massachusetts residences, this strategy hardly bears contemplating.

The costs to residents and property owners could be astronomical, particularly in older homes that are not wired to handle the electricity load for modern electric appliances. For context, California has considered similar policies and completed economic analysis that is currently lacking for this policy proposal in Massachusetts. In California, the 2020 cost of purchasing all electric appliances is up to \$2,674 in an existing home. On top of that, the cost of electrical infrastructure upgrades in a single-family residence could cost up to \$7,345 in 2020.<sup>2</sup>

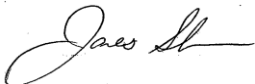
We believe the most responsible – and achievable – approach to decarbonization is to optimize the use of natural gas, not minimize or eliminate it. Sound public policy should direct us to integrate and optimize these systems to support our lives as we reduce our nation’s carbon footprint.

De-carbonization does not equate to electrification. We need to move past an overly simplified set of assumptions and presumed outcomes that privilege electrification over other de-carbonized end use fueling methods. We need a more realistic and grounded, less doctrinaire approach to managing the role of the gas pipeline system for transporting and delivering energy to the users who depend on it.

In closing, serious approaches to policy, grounded in social, economic, and engineering realities will need to be considered if we are going to get real about reducing carbon in the state’s energy systems. Balanced energy solutions should include providing options and incentives that families and businesses can use to achieve climate goals by reducing emissions based on their needs and financial abilities.

We are here to help, and to be a part of the solution. As utility workers, we are confident that as long as we, the technical experts who maintain these systems every day, have a voice at the table, we can meet and overcome the state’s energy and climate challenges.

Sincerely,



James T. Slevin  
National President  
Utility Workers Union of America, AFL-CIO

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<sup>2</sup> <https://c4bes.org/wp-content/uploads/2018/09/Navigant-Report-Impacts-of-Residential-Appliance-Electrification.pdf>



**VERGENT**  
power solutions

March 17, 2021

**SUBJECT: VERGENT POWER SOLUTIONS, INC. COMMENTS IN SUPPORT OF COMBINED HEAT AND POWER UNDER THE CECP**

Vergent Power Solutions is the distributor for Capstone Turbine Corporation for New England, the Midwest and Eastern Canada. Our company develops Combined Heat and Power (CHP) projects across North America and provides service to our existing microturbine fleet of over one hundred fifty operating plants.

Our New England sales and service facility is in Woburn, MA. In Massachusetts, we have CHP systems operating with many end users in the Commercial, Industrial and Institutional markets, such as Mass Maritime Academy, South Shore Hospital, MathWorks, Northampton Veterans Affairs hospital, Garelick Farms, and National Grid LNG, among others. We currently have dozens of new projects under development in the Commonwealth.

We are commenting because we are concerned about the possible tightening or outright elimination of CHP incentives in Massachusetts. While we applaud the DOER for its robust plan to reduce GHGs, we believe that CHP must have a prominent place in the Commonwealth's GHG reduction strategy. CHP already plays a valuable role in state utilities' energy efficiency and GHG programs nationwide.

CHP can be a bridge to deeper de-carbonization in the future. Already, CHP systems are running on Biogas and Renewable Natural Gas, and many CHP manufacturers are exploring hydrogen as a fuel source. The pipeline gas is and will continue to get cleaner. While those markets continue to mature, it is vital that highly efficient CHP systems are part of the Commonwealth's energy mix. We respectfully request that DOER continue to provide Mass Saves incentives to CHP systems because the incentive support is necessary in order to make CHP attainable to Massachusetts customers, especially during this period of economic uncertainty and grid modernization/ reliability issues. Customers are demanding that we look at decentralized long-outage resiliency options for them and they would like it to not run on diesel fuel. We urge the DOER to look at the number of skilled jobs in the manufacturing, engineering, construction and technical fields that CHP development supports. These jobs are located in Massachusetts because of supportive programs like Mass Saves.

We are including a summary of the many benefits of CHP on the following page.

We also support the comments of the New England CHP Initiative (NECHPI).

Thank you.

Justin Rathke  
President  
Vergent Power Solutions

Combined Heat and Power (CHP) has myriad economic, environmental, and social benefits, including:

- CHP reduces particulate emissions and carbon emissions. When designed properly as highly efficient CHP, a CHP system lowers emissions compared to non-baseload power generation and separate production of thermal energy. For example, a 70 percent efficient CHP system using Capstone Microturbines emits approximately 625 lbs/MWh of CO<sub>2</sub> whereas the Massachusetts grid's non-baseload sources emit 914 lbs/MWh, according to the EPA's egrid data from 2018. Particulate emissions reductions from other pollutants such as NO<sub>x</sub> are even more significant when comparing low emission CHP to the grid.
- CHP can provide valuable locational grid support to constrained utility infrastructure. The new UL1741SA grid interconnect standard rightly identifies DER's ability to support grid insecurity.
- CHP is among the only DER's that are truly capable of making facilities more resilient. CHP is often used as the backbone for microgrids for this reason. The DOE has identified CHP having advantages over traditional backup systems. ([www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp\\_for\\_reliability\\_guidance.pdf](http://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_for_reliability_guidance.pdf)).
- CHP delivers energy savings to commercial, industrial and institutional users across the entire economy. Grid electricity in Massachusetts and other states have continued to rise as utilities are confronted with investments in aging grid infrastructure, renewable energy and other capital costs. Natural gas CHP represents a vital hedge against rising grid prices for many businesses and communities. CHP as a hedge provides an economic lifeline to users in Massachusetts allowing them to better compete in the wider economy.
- CHP has become even more needed in the COVID era as businesses and communities are faced with falling revenues and profits. Many industries have not been, and likely will not be, bailed out by government subsidies. Lowering operational costs with measures such as CHP can be these users' only means to counter the pandemic's economic toll. In light of the pandemic, the DOER should be looking at ways to increase, not decrease, support for CHP.
- The CHP industry, like the clean energy industry as a whole, is a valuable generator of jobs and economic growth. Unlike static and established industries such as the utility industry, CHP can provide job expansion in Massachusetts if properly supported. Right now, this expansion is under threat from the pandemic and economic recession.

March 19,2021

To Whom it May Concern



As a Mass. licensed architect in the Commonwealth of Massachusetts and Managing Principal of Studio G Architects, I understand deeply the urgency of decarbonizing the built environment. I want to thank you for the leadership in helping to mitigate the Commonwealth's impacts on climate change. The plan includes many great ideas and actions but would be strengthened by:

- Addressing embodied carbon: Per Architecture 2030, embodied carbon is responsible for 11% of annual global GHG emissions. Between now and 2050, roughly one-third of GHG emissions from a typical new construction building will be from the embodied carbon. The path to decarbonizing emissions from the built environment needs to address policies and actions for embodied carbon. Establish a task force for embodied carbon, similar to the Task Force on Clean Heat & Cap Heating Fuel Emissions, in order to make policy recommendations for addressing and reducing embodied carbon.
- Strengthening Strategy B1 to make an opt-in net zero energy stretch code available to interested communities by 2022 t. Many Massachusetts communities in which we work are seeking a higher performance stretch code.
- Prioritizing Equity & Justice: Lower income communities, primarily people of color, are most at risk from climate impacts and have the fewest resources to mitigate these risks. Prioritize analysis of cumulative impacts while reducing the burdens and increasing benefits to such communities and ensure their representation in the process. Make financing available to Environmental Justice communities to assist in energy efficient upgrades and conversion to non-fossil fuel heating systems.

Thank you for considering these proposals.

Sincerely,

A handwritten signature in black ink, appearing to read "Gail Sullivan".

Gail Sullivan  
Managing Principal, FAIA and LEED BD+C



*By email to [gwsa@mass.gov](mailto:gwsa@mass.gov) and submitted to online portal*

March 19, 2021

**Re: Comments of Associated Industries of Massachusetts to the 2030 Clean Energy and Climate Plan (CECP)**

On behalf of the over 3,500 cross-industry leading business members of the Associated Industries of Massachusetts (AIM), I would like to offer our comments relative to the 2030 Clean Energy and Climate Plan (CECP), released December 30, 2020. Comments are due by March 22, 2021.

The 2030 CECP establishes a blueprint for achieving the Commonwealth's 2030 climate goal, an interim step in reaching the ultimate 2050 net-zero goal.

Please note that the following comments are based on the current 2030 CECP and do not address any changes that may be necessary due to recent climate legislation.

**GENERAL COMMENTS**

AIM supports the clean energy goals of the commonwealth in all sectors – transportation, buildings, and energy supply.

However, the 2030 goal is aggressive, even with new technologies and clean or renewable energy projects expected to come online between now and 2030. The biggest challenge, correctly identified in the CECP, is the fact that nearly 75% of emissions are from small, distributed sources - vehicles and heating systems owned by businesses, institutions, and individual households. As a result, just a few projects or programs impact the bulk of the expected reductions. A delay in any project will impact the timeline significantly. Therefore, we support a holistic approach across all sectors, as articulated in the CECP, and flexibility in addressing each sector's emissions so delays in one sector do not impact the overall goal.

The CECP rightly recognizes that not all sectors will transition on a predictable scale. We would like to add that some sectors may, in fact, have periods where emissions temporarily increase. This could happen, for instance, as emissions are transferred from one sector to another, as they would be when internal combustion engines (ICEs) transition to electric vehicles (EVs) or electric heat pumps are substituted for natural gas heating systems. If the timing is not synchronized with increased clean or renewable generation, emissions in the generation sector may increase. It is up to the policymakers to explain this nuance since the data may be confusing.

Additionally, the risk of public backlash is real if these transitions are not explained fully or implemented poorly or abruptly. While the support for carbon reduction policies remains high among the general population, that support has not been tested since most carbon reduction programs have occurred behind the scenes in the electric supply sector and have not impacted the average resident.

AIM applauds and supports the commitment in the CECP to low-income areas. However, it is imperative that EOEEA recognize that reducing carbon is not a one-size-fits-all undertaking and solutions may be different in different areas unrelated to economic justice. For instance, some areas (low-income or not) are not suitable for EV integration due to logistical issues and EOEEA should avoid the urge to force adoption. Perhaps those areas would be better served by enhanced heat pump programs or better access to public transportation. Again, this issue needs to be explained and discussions need to be transparent, so everyone can understand the cumulative benefit.

Also, efforts to help low-income populations should not come at a cost of ignoring moderate-income populations who are also impacted by higher prices. Some programs save money, of course, but many moderate-income populations are not likely to incur large financial outlays or increases in their energy costs for the sole purpose of lowering greenhouse gases, particularly if other states have no such requirements. Cost increases impact all income levels and moderate-income households may be in no better position to increase their costs as low-income households without some perceived direct and immediate benefit. Businesses too, have varying levels of sensitivity to even moderate cost increases. That means introducing new measures only when the technology and programs are ready.

EOEEA must consider short-term fixes that can be quickly instituted, even if they don't necessarily align with long-term goals. Each milestone (2030, 2040 and 2050) is legally enforceable, and that may mean in some instances making short-term changes necessary to meet short-term goals, while other changes are necessary to reach long-term goals. EOEEA should resist the notion that permanent solutions need to be done quickly. That could lead to problems in delivery or quality of work and issues in either one of those areas could set the transition back years. Deliberate, consistent changes are better.

Finally, it is time to review all programs in every sector and start to think about modification, coordination and even elimination of some. We urge now, as we have in the past, the creation of one agency or group with a fungible funding source that allows investments in areas where the greatest carbon reductions will occur – transportation, buildings, or energy supply - and prioritize those that achieve the greatest reductions at the lowest cost.

## **TRANSPORTATION:**

The transportation sector is the largest emitter of greenhouse gases. To achieve the goals, gasoline and diesel use must be eliminated by 2050, with very large reductions in between.

AIM supports the major programs outlined in the 2030 CECP – the Transportation and Climate Initiative (TCI), the low carbon fuel standard, and Advanced Clean Car, Advanced Clean Trucks, and Advanced Clean Fleet programs.

This is a monumental task and one that is particularly sensitive to public backlash as its impact goes beyond just the fuel in the tank.

For instance, a transition from ICEs to EVs will not only completely change the way people drive but will also require a complete change in the way that road maintenance is paid for since the

gasoline tax will disappear. This could result in political fallout and hurt the transformation if action on this issue is delayed. Given the trajectory of the adoption of EVs needed to meet CECP goals, the inflection point of stagnant or declining gasoline tax receipts will probably happen as early as 2025, a relatively short period of time, taxwise. EV owners, particularly early adopters, may be resistant to paying a “gasoline” tax, even if it’s necessary and appropriate for well-maintained roads. The political discussion around this must start at the same time as the 2030 CECP is finalized.

As a result, it may be better to concentrate on fleets first, which will reduce emissions quickly as well as make the public comfortable with EV solutions. As fleet programs address cost-parity or add sufficient charging stations, this will give potential owners the confidence level and familiarity to purchase EVs.

We urge EOEEA to also think outside the box and recognize that the installation of the infrastructure necessary to support a home or even a business EV charger may not be coincident with an EV purchase. A person buying an EV for the first time is likely to be hesitant about adding a charger to their house, particularly if they are unsure of new wiring requirements for their home beyond a charger (i.e., upgraded electric services or unsightly wires outside of their homes).

Therefore, like the energy efficiency audit program, if a customer is contemplating the purchase of an EV, perhaps there should be a free program that allows an expert to review the person’s home and charging possibilities before they make the purchase – guaranteeing that such an installation can be done before the EV purchase. Based on this analysis, the auto dealer could arrange to have the charger installed before the person picks up their car. This would eliminate the chicken and egg syndrome for first time EV buyers. In some cases, a homeowner may opt-in to the installation of the charger (or the infrastructure to support it) well before the time he or she purchases the car so it is ready for when they are able to buy or to help a tenant or family member that may not live at the address.

Finally, as an option to a rebate, Massachusetts should consider low interest loans for electric vehicles that can be completed at dealers, like the HEAT loan under MASSSAVE. This will allow consumers who can’t afford financing, even after rebates, to purchase an EV.

## **BUILDINGS:**

Buildings account for about one-third of emissions. In addition to energy efficiency (which also reduces emissions in the energy supply sector) reductions in buildings are accomplished in a few ways: conversion of current fossil systems to electricity and better building energy codes.

AIM has been a member of the Energy Efficiency Advisory Council (EEAC) since 2008 and therefore follows this issue closely. The comments below are applicable to homeowners and businesses.

While AIM supports the eventual transition to net-zero buildings we believe some of the assumptions in the CECP are a bit optimistic and urge EOEEA to recognize the reality of switching tens of thousands of homes to new heating systems. In some cases, the issue is the same we articulated above for the transportation sector – the heightened possibility of public backlash if

programs are poorly thought out. Also, we sense that in some cases EOEEA is adopting a blunt approach rather than a deliberate, coordinated strategy, particularly with regards to heating.

The fact is most people are satisfied with their existing heating system and most people are not going to make a large outlay with possible disruption in their lives or introduce uncertainty. This means that many are unlikely to convert to a heat pump solely for societal benefits when their existing system is performing adequately.

This is particularly true for older homes that are not laid out for easy heat pump installation. Under current technologies, even cold weather heat pumps need backup and that means homeowners may need to maintain two systems – a situation that is likely to be very complicated for many, and defeats some of the cost benefits of switching to a heat pump in the first place. In some cases, if a system is failing, a person would need to install two systems simultaneously, an incredibly complicated scenario.

As such, instead of trying to capture all reductions it may be better to take a gradual approach. For instance, a home using oil may benefit if it transitions to natural gas or low-carbon liquid fuel first, with the option later to add a heat pump – in essence making it heat pump ready. Rebates could also be designed to encourage such behavior. Also, we urge EOEEA not to be too quick to replace perfectly good propane and natural gas systems that are already high efficiency. While they are clearly not zero-carbon, with our current energy mix neither are heat pumps and it is quite possible over the next decade the environmental benefits of heat pumps may be less than high efficiency natural gas or propane.

EOEEA should oppose outright natural gas bans. There is lots of work going on in areas such as hydrogen and renewable natural gas and those fuels will require an existing infrastructure to meet our goals. While they are clearly at their infancy now, they may not be in the next decade and removing or restricting natural gas infrastructure now may result in stagnant gains later.

There is also the issue of the strain all this electrification will put on our electric generation. Even under the most optimistic of circumstances, our energy use will not be totally carbon free for decades. Whether sacrificing higher short-term emissions for long-term reductions is better or worse for the environment ultimately is a policy decision that needs to be addressed.

A measured approach will also help with one area that is limiting adoption – a shortage of skilled workers. Some transitions will be limited by time and the necessary trades will not be available. A too quick transition will strain the capacity of workers to meet their needs, creating a less than pleasant experience for consumers. Also, as heat pumps become more common we can monitor their long-term reliability and other costs associated with their use as technology improves.

This is not to suggest, of course, that transition to heat pumps should not be done, just that overpromising benefits may result in missed opportunities in a few years that are far more cost-effective. Relatively speaking, the home heating market is an extremely small source of greenhouse gas emissions. In many cases, money spent virtually any other place will get bigger gains for smaller costs. Therefore, quick short-term and medium-term changes will allow a gradual transition without impacting overall goals.



### **Stretch codes and appliance standards:**

AIM supports reasonable building codes that have a technological basis, are attainable and developed with extensive stakeholder input. However, these codes cannot be so restrictive that they operate to put a damper on housing or affordable housing or serve as de facto anti-growth measures. We also support appliance standards based on the same criterion.

### **Commission on Clean Heat:**

AIM supports creation of an EOEEA led, cross secretariat, interagency task force and would like to be included on this commission. It is important that the task force be inclusive and include stakeholders from many parts of the state's economy. Since this Task Force will propose statutory, regulatory, and financing mechanisms needed to ensure the development of reliable and affordable clean energy heat solutions, the analysis should be based on transparent data and cost-effective solutions. A large, diversified task force will help.

### **ENERGY SUPPLY:**

AIM has supported virtually all clean energy initiatives in the energy supply sector, including competitively bid offshore wind and clean energy procurement, the 2018 Solar Massachusetts Renewable Target (SMART) regulations, regional procurement of renewable and clean energy (i.e., coordination with other states on procurement), updating infrastructure investments that will safely allow the integration of all these new sources, investments in energy storage, and the CES-E which maintained existing clean energy sources.

However, EOEEA must increase their role as an impartial source of information during public debate. For instance, there appears to be a notion that attaining 100% "renewable" energy is the only way to achieve these goals. The advocates, however, are clearly missing the connection between "renewable" energy and "clean" energy, even though all sources are needed to meet the goals. In fact, the CECP identifies one issue that AIM is very concerned about - the fact that under current law, energy procured by the New England Clean Energy Connect (a clean energy source) will become a stranded cost on ratepayers due to planned increases in the Renewable Portfolio Standard (RPS). This could cost ratepayer hundreds of millions of dollars. Proper education will help.

Thank you for the opportunity to comment on this proposal. Should you have any questions please do not hesitate to contact me at 617-488-8308.

Sincerely yours,



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March 19, 2021

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

**RE: Public comments regarding the Interim Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides,

The I am pleased to respond to the Interim Clean Energy and Climate Plan for 2030 (“2030 CECP”).

The I have grave concerns regarding the impact climate change will have on the Commonwealth, the United States, and the world, and I have each made strong commitments to reducing greenhouse gas emissions. I appreciate the thoughtful analysis the Executive Office of Energy and Environmental Affairs (EEA) has conducted to understand the complex scientific, technological, and economic impact for various roadmaps.

As we work with you to advance our shared focus on climate mitigation, our we are struggling to answer the same question the EEA posed in the 2050 Decarbonization Roadmap Study:

***How can we achieve Net Zero while maintaining a healthy, equitable, and thriving economy?***

The release of the 2050 Decarbonization Roadmap Study and the 2030 CECP, which provides a rich and diverse collection of strategic state actions cities and towns can use to build local implementation plans, is an important first step, and I agree with the plan’s overall approach to reducing emissions. Specifically, I agree with the bold actions, such as pressing BBRS to quickly implement a 2050-compliant building code, establishing 2035 as the end of sales of fossil fuel vehicles and taking actions that would change the goals and priorities of Mass Save and the Department of Public Utilities so as to align with our climate goals.

To further enhance the Commonwealth's plan, I provide the following specific requests from the viewpoint of our Town who is endeavoring to do our part in achieving Massachusetts' climate goals and to model leading municipal actions within the state and nationally:

### **1. Establish a Municipal Version of the GWSA Implementation Advisory Committee**

The Interim CEC Plan states that, "It will take action at all levels of government..." and "...continued action by local government across the Commonwealth is required." I agree with this statement and encourage the Commonwealth to formally engage municipalities in the Plan's implementation. I recommend establishing a Municipal version of the GWSA Implementation Advisory Committee to provide an ongoing bridge for communications between state and local government. The Committee should be designed to reflect the diverse nature and needs of municipalities based on size, location, and economic structure.

### **2. Increase Funding for Municipal Climate Action**

I encourage the Commonwealth to realize that, because work is needed at all levels of government, so too are new funds needed at all levels. Without this local support, which the 2030 CEC Plan describes as "required", local actions will be delayed, sporadic or in too many cases not available at all.

Local funding should be prioritized for regional collaboration which leads to greater efficiency and uniformity among neighboring municipalities. These resources are needed at three levels. First, the Commonwealth should provide support at the community level such as funding for sustainability coordinators for program administration as well as funding for community-wide coaching to guide an equitable transition to 2050-compliant technology for all stakeholders. Second, municipalities need experts who can serve as resources in clean energy and sustainability technologies who can be available regionally to define and share best practices among cities and towns and ultimately to negotiate better deals with vendors. Third, it is crucial that municipalities are included in the improvements and expansions made to grant, rebate, and incentive programs (including renewable energy incentive programs) that will help them lead by example. Funding to facilitate, implement, maintain, and operate clean energy and electrification technologies such as EV charging station networks and clean heating equipment will be crucial to accelerating municipalities' progress to net zero.

### **3. Update the Building Code with a High-Performance Stretch Energy Code**

The 2030 CEC Plan correctly identifies the importance of moving quickly to a "new, high-performance stretch energy code requiring passive-house level building envelope efficiency." In doing so, the 2030 CEC Plan outlines a plan to "present a new high-performance stretch energy code to the Board of Building Regulations and Standards (BBRS) in 2021 that allows for Green

Communities to opt in starting in 2022 and that it will become mandatory and effective statewide no later than January 1, 2028.”

As a resident of Medfield, which has been designated as a Green Community, I support the development of a new high-performance stretch energy code and the rapid, orderly transition to this code. To encourage early adoption by Green Communities, I recommend a pool of grant money be made available exclusively to Green Communities who adopt the high-performance energy stretch code prior to 2028. This would accelerate adoption of 2050-compliant technology statewide, and this incentive would provide motivation for existing Green Communities to move quickly toward the goal we share.

I also seek to remind DOER how challenging it can be to adopt a new code as a bylaw through a vote of Town Meeting. Creating a mechanism for Green Communities to avoid this local legislative burden as part of the opt in process would further increase the speed of widespread code adoption. Indeed, in debating and voting to support the existing stretch energy code, Green Communities have already agreed to adopt “any future editions, amendments or modifications thereto” established through the BBRS update process. As such, I ask the Commonwealth to update the 2030 CECP to clarify the process Green Communities must take to adopt the proposed high-performance stretch code, and request a provision that gives the chief municipal executive in a Green Community the authority to opt in.

I welcome that Medfield is offering to partner with the DOER to further discuss these requests.

#### **4. Align Funding for Public Buildings with Net Zero Goals**

The 2030 CECP acknowledges the importance of “avoiding new infrastructure or construction that is based on fossil-fuels for heating which would not be 2050 compliant, as well as ensuring that new equipment and products within buildings are on the path towards 2050 compliance.” However, one of the largest funders of new public buildings, the Massachusetts School Building Authority (MSBA), does not currently require districts to seriously consider 2050 goals in the design and construction of new or renovated school buildings.

At present, the MSBA provides two additional reimbursement points to projects that exceed the Massachusetts Energy base code by 20%. While this is a step in the right direction, it does not go far enough. School districts across the state, including Acton-Boxborough, Arlington, Belmont, Brookline, Cambridge, Lexington, Watertown, Wellesley, and Westborough are demonstrating that fully electric, net zero ready schools – and other building types – are possible and that they do not present a significant financial burden to taxpayers. I urge the EEA to require all new public buildings that are funded by the Commonwealth to be net zero

ready starting in 2022 and to direct additional funding through such avenues to support the implementation of innovative clean energy and sustainability solutions in their construction.

## **5. Prioritize Public Transit in Transportation Emission Reduction Strategies**

While I applaud the plan's focus on the "near-term, widespread electrification of the majority of the Commonwealth's vehicles," the absence of a clear strategy to improve and expand public transit is worrisome.

The only mention of public transit in the 2030 CECP is in relation to the Transportation and Climate Initiative Program (TCI-P), which "will also help support investments that will make it easier to get around without a car, such as improved public transportation." This singular reference to public transit reflects an inadequate level of attention to a resource that is critical to maximizing the effectiveness of smart growth policies in our communities and across the Commonwealth and is equally necessary in advancing equity in the transition to net zero. I ask the EEA to re-evaluate the role of public transit in achieving the state's 2030 emissions reduction goal and, at a minimum, to provide further detail on how TCI-P funding will be used to improve public transportation

## **6. Provide Resources to Accelerate Electrification Locally**

While municipal governments have limited expertise in emerging technologies like electric vehicles and heat pumps, we have unique insight into our communities and the concerns of local property owners who will be making decisions on the adoption of carbon-free technologies. As concerned residents, we are eager to support early adopters and normalize these technologies, similar to the experience many communities have had participating in the Massachusetts Clean Energy Center's Solarize and HeatSmart programs.

As MassCEC transitions from supporting community-level technology campaigns, I ask the state to provide municipalities with training, engineering services, technical support, web-based resources, procurement tools, implementation services and more to educate and engage with our residents and business owners about electrification opportunities.

## **7. Increase Access to Emissions Data**

Local data supports local decisions and provides feedback on progress. At present, state agencies and public utilities capture data about emissions-related activities occurring in local communities, but do not maintain or share the data in a timely manner that allows communities to assess needs, affirm actions, or allow for adjustments.

I ask the Commonwealth for increased access to emissions-related data that impact our cities and towns. This includes the number of electric and battery electric vehicles registered in our communities, the number of kilowatt-hours generated by solar panels located in our communities, the number of heat pumps installed in our communities, the number of properties that have participated in MassSave by Census blocks and the types of energy efficiency improvements taken, and more.

A step in the right direction is the Metropolitan Area Planning Council's (MAPC) new tool for measuring community-wide greenhouse gas emissions, which was funded by an EEA grant. This tool allows any Massachusetts community to estimate its community-wide emissions without the added cost of hiring a consultant. It is a tremendously valuable start, but even it is handicapped by stale data – most notably the 2014 Massachusetts vehicle census, which – more than five years later, remains the most recent valid vehicle census available from the state.

I also believe the Massachusetts Legislature plays an essential role in conveying the voice of citizens as well as providing funding and legal mandate to the goals and path forward for the Commonwealth. There are many valuable elements of the climate legislation currently being considered in the Statehouse, and I urge the Baker Administration to act quickly on this and to seek a compromise to ensure a climate bill is passed early in 2021, which will ensure the 2030 CECP has the full support of the state government.

I am proud to be part of Massachusetts's effort to achieve net zero by 2050 and look forward to collaborating with you to realize our shared goal.

Thank you for your commitment to the climate.

Sincerely,

*Megan B. Sullivan*



March 22, 2021

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
Commonwealth of Massachusetts  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Dear Secretary Theoharides,

Borrego Solar Systems, Inc. (Borrego) appreciates the opportunity to comment on the Interim Clean Energy and Climate Plan for 2030. We commend the Governor for his commitment to reaching net zero emissions by 2050. Borrego is proud to employ more than 150 people in Massachusetts who are working every day to deliver the clean energy that will make that transition possible. We also congratulate the Executive Office of Energy and Environmental Affairs on the release of the 2050 Decarbonization Roadmap. The comprehensiveness and scientific rigor of the analysis speak to the seriousness with which the Administration approaches the challenge of decarbonization.

However, while the 2050 Roadmap as a whole is bold and ambitious, we are concerned that both the Roadmap and the Interim Clean Energy and Climate Plan for 2030 (2030 CECP) lack sufficient ambition and urgency in the *near term*. The plans rely too heavily on strategies that are as-yet unproven, and fail to fully take advantage of strategies, such as solar and storage, that are well established and cost effective today. Solar development has led the commonwealth's progress in decarbonization to date, and yet the pace of solar deployment has decelerated in recent years and is likely to continue slowing down, calling into question the 2030 CECP's assertion that simply implementing existing policies and programs will be sufficient to meet the 2030 target.

In terms of challenges to solar development, we greatly appreciate that 2030 CECP recognizes the need for significant additional ground-mounted solar. We also appreciate that the plan recognizes that siting challenges are not unique to solar but must be addressed for all forms of renewable generation and transmission, and we are eager to help the Commonwealth proactively address those challenges. Interconnection is perhaps an even bigger challenge that must be overcome in order to meet the 2030 target; we note that the CECP acknowledges this and we continue to urge the Administration to address this challenge with more urgency.

## Speed of Decarbonization

The 2030 CECP states that the interim decarbonization goals between today and 2050 were set with an intent to balance the speed of decarbonization with costs. However, climate change is a problem of stocks, not flows: the extent of the disastrous consequences we face are determined by the total amount of GHGs that have been emitted across hundred-year timescales, not the amount we are emitting at any point in time. A one percent decrease in annual emissions in 2020 will have far more impact than a one percent decrease in emissions in 2040 because each subsequent year in which emissions stay high contributes to the cumulative buildup of GHGs. The greatest climate benefits come from bending the curve as much as possible, as soon as possible. Yet the 2030 CECP would still have us on track to emit almost ten million megatons of greenhouse gas emissions from electricity generation in 2030.<sup>1</sup>

The electricity sector has been leading the commonwealth's progress on decarbonization to date, and still represents the lowest-hanging fruit for continued emissions reductions. Rather than rest on our laurels, we should keep accelerating in the areas where progress is easily achievable while more difficult transitions are ramping up. **Decarbonizing the electricity sector more aggressively in the near term can provide an insurance policy in case the other sectors identified in the 2030 CECP continue to be more difficult and costly or take longer than we hope.**

Within the electricity sector, the 2050 Roadmap and 2030 CECP rely heavily on offshore wind and regional transmission. While essential to a decarbonized future, these strategies will not come to fruition for 5 years or more, and costs and timelines for these difficult-to-permit, high-risk infrastructure projects could change significantly. Solar, on the other hand, is a proven technology with a mature market and hundreds of active businesses in Massachusetts that is ready to quickly and cost-effectively deliver more clean power to the grid. However, the 2050 Roadmap Energy Pathways Report anticipates the vast majority of solar buildout (in particular, ground-mounted solar) occurring after 2035.<sup>2</sup> This analysis informs the solar target in the CECP of an additional 2 GW of solar between 2025 and 2030, which represents a *deceleration* of the current pace of solar development (in contrast to the goal of 3.2 GW solar by 2025). It seems incongruous with good climate policy to be ramping *down* deployment of solar--the one proven generation resource that Massachusetts has in its arsenal--just as addressing the climate crisis is becoming even more urgent. The signal this plan sends to the solar industry is that we should be pulling back, just when, in our view, the state needs us to ramp up.

As the administration may be aware, the solar industry has already seen a deceleration in Massachusetts due to interconnection headwinds and more restrictive land use policies. The charts below, which are based on data from the Wood Mackenzie *U.S. Solar Market Insight* report, show that while national solar installations (non-residential, non-utility) have kept a similar average pace over the last 4-5 years, in Massachusetts there has been a sharp decline in the number of solar installations in the last 2-3 years.

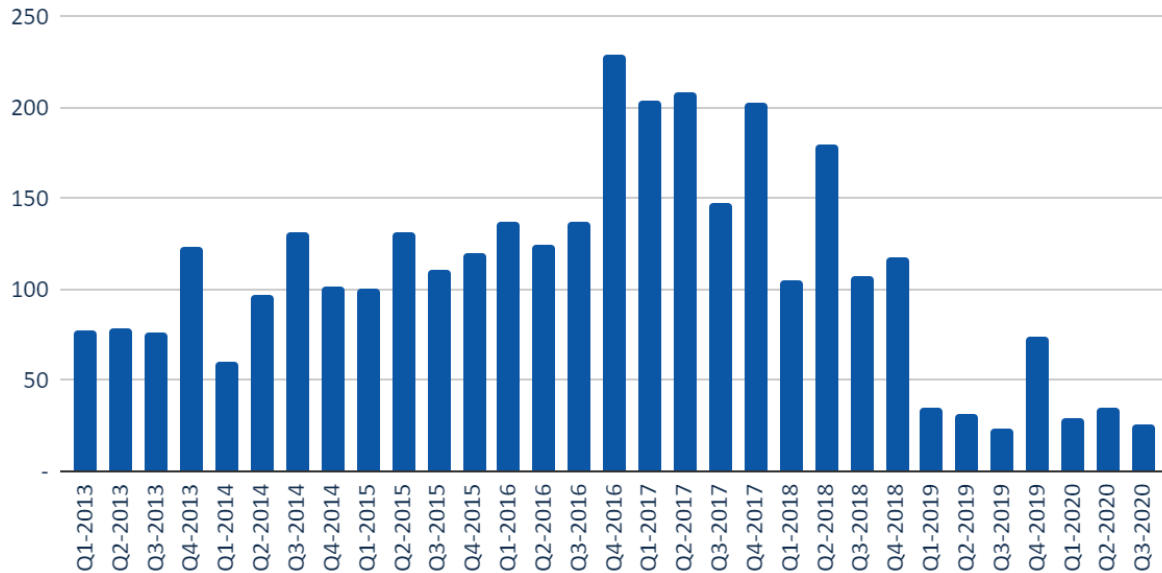
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<sup>1</sup> *Interim Clean Energy and Climate Plan for 2030*, December 2020, page 36.

<sup>2</sup> *Energy Pathways to Deep Decarbonization*, December 2020; Figure 40, page 89.

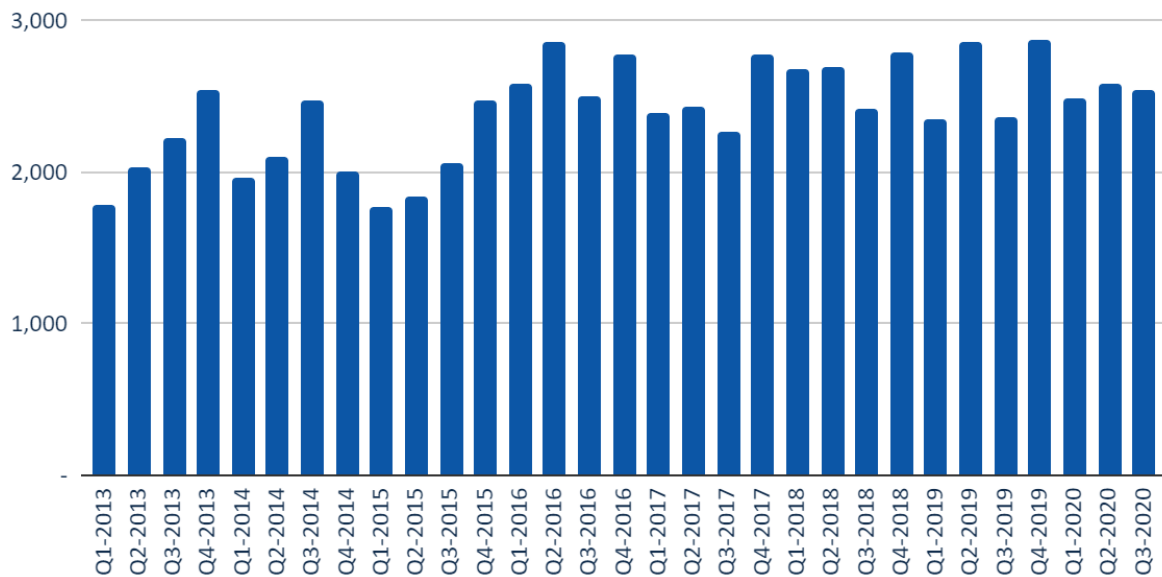


### Number of Non-Residential PV Installations in Massachusetts



Source: Wood Mackenzie, U.S. Solar Market Insight: Q4 2020

### Number of Non-residential PV installations Nationwide



Source: Wood Mackenzie, U.S. Solar Market Insight: Q4 2020

These data are corroborated by DOER’s Renewable Energy Snapshot, which shows that after steadily increasing each year from 2009 to 2017, the total megawatts of solar installed in

Massachusetts declined from 571 in 2017, to 370 in 2018, to 237 in 2019.<sup>3</sup> This represents a nearly 60% decline in only two years. These data call into question the 2030 CECP's assertion that the status quo is sufficient to keep Massachusetts on pace for the 2030 targets, much less to act with the urgency that is truly required to avert climate catastrophe.

**Recommendation: EEA should set a more ambitious target for electricity sector decarbonization by 2030, and achieve it by accelerating, rather than decelerating, the pace of solar deployment.**

### Cost of Decarbonization

The 2030 CECP rightly points out that the speed and cost of decarbonizing the transportation and building sectors depend on decisions by millions of individuals, and thus the model is driven in large part by the replacement timelines for vehicles and appliances. Accelerating the decarbonization of those sectors before the typical replacement timelines represents a huge increase in difficulty and cost. Decarbonizing the electricity sector, however, relies on a relatively small number of actors, and when using Levelized Cost of Energy metrics that take into account the full life-cycle, solar and wind are already the cheapest form of electric generation.<sup>4</sup> Technology-neutral procurements are one strategy that could be employed to bring additional clean energy onto the grid in the near term at the most competitive prices.

Furthermore, the 2050 Roadmap Energy Pathways Report, upon which analysis the 2030 CECP targets are based, notes that “[t]his study did not attempt to quantify the avoided damages from climate change and thus does not comment on the appropriate value of a ‘social cost of carbon.’”<sup>5</sup> Yet Massachusetts residents, businesses, and state and local governments have already incurred enormous costs from climate change impacts such as severe weather, increased stormwater and coastal flooding, drought, etc. **If the justification for not decarbonizing faster is that it would be too costly, that calculation should include an accounting of the costs of delayed action.**

Recognizing this, the Global Warming Solutions Act Implementation Advisory Committee, which advised the development of the 2030 CECP, produced a [guidelines and priorities document](#) to inform this plan that called for both a price on carbon and for EEA to develop a social cost of carbon.<sup>6</sup> We strongly agree that any cost-benefit analysis must include a social cost of carbon,

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<sup>3</sup> Massachusetts Department of Energy Resources Renewable Energy Snapshot, <https://www.mass.gov/info-details/renewable-energy-snapshot#installed-solar-capacity-in-massachusetts>

<sup>4</sup> Lazard's Levelized Cost Of Energy Analysis — Version 14.0, October 2020. <https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf>

<sup>5</sup> *Energy Pathways to Deep Decarbonization*, December 2020; page 69.

<sup>6</sup> Global Warming Solutions Act Implementation Advisory Committee Guiding Principles, Cross-Cutting Policy Priorities, and Sector-Specific Policy Priorities for the Clean Energy and Climate Plan for 2030, October 2020; page 3, 6.

<https://www.mass.gov/doc/iac-work-group-proposed-guiding-principles-and-policy-priorities-updated-1026-2020/download>

and we agree that markets should be reformed to take that cost into account, whether through carbon pricing or other mechanisms. The federal government is currently in the process of adopting an updated social cost of carbon, and Massachusetts could easily use the robust federal process as a guidepost for determining the social costs and benefits of various decarbonization options.

**Recommendation: EEA should accelerate progress toward decarbonization in the electricity sector by implementing technology-neutral procurements and other measures, and should include a social cost of carbon in its cost-benefit analyses.**

### The Role of Distributed, Front-of-Meter Solar and Short Duration Battery Storage

Distribution-connected, front-of-meter (FOM) solar, which makes up a large portion of the solar currently operating in Massachusetts, does not appear in the 2050 Roadmap modeling; only behind-the-meter (BOM) and large-scale, transmission-connected solar are included. While distribution-connected, FOM solar shares characteristics with each of these resources, these resources are far from interchangeable. Land use is considered in the report to be a defining constraint on ground-mounted solar. However, the land use pros and cons for small-scale (1-5 MW AC) and large-scale (20+ MW AC) solar are very different. In addition, recent studies, such as *Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid*,<sup>7</sup> have demonstrated how smaller-scale solar (both BOM and FOM) plays a crucial role in enabling the deployment of larger transmission-connected resources and leads to overall net *savings*. The distribution system benefits and avoided infrastructure investments enabled by the deployment of distribution-connected FOM solar have a significant impact on the system that should not be overlooked. The omission of distributed FOM solar from the model potentially inflates the model's projection of the cost of decarbonization scenarios, as well as potentially delaying solar buildout by over-relying on large-scale resources that require time-consuming transmission upgrades in order to be deployed.

In addition to omitting distribution-connected front-of-meter solar, the model also omits short-duration battery storage. Understandably, the Energy Pathways Report finds that battery storage is an expensive solution for balancing the variability of wind production, which can involve days at a time of little to no production. However, the model ignores short-duration battery storage that can shift the time of day when solar generation is available to the grid. This omission of short-duration storage is surprising, because it runs counter to current administration policies and programs, most notably the Clean Peak program and the requirement for co-located battery storage under SMART. By omitting short-duration storage, the 2050 Roadmap ignores the many benefits of energy storage identified in the Administration's own 2016 *State of Charge* report, which finds that "new storage technologies

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<sup>7</sup> Vibrant Clean Energy, December 2020.  
[https://www.vibrantcleanenergy.com/wp-content/uploads/2020/12/WhyDERs\\_ES\\_Final.pdf](https://www.vibrantcleanenergy.com/wp-content/uploads/2020/12/WhyDERs_ES_Final.pdf)

are an important component of a modern electric grid and a resilient clean energy future for the Commonwealth.”<sup>8</sup>

Energy storage will play an increasingly important role in the next decade due to both the need to balance intermittent renewable resources in a decarbonizing electricity system and the need to ensure reliability and resiliency in the face of a changing climate and more severe and frequent extreme weather. Therefore it is troubling that the 2030 CECP does not include any mention of a storage goal or a need to evaluate whether current policies (such as Clean Peak and SMART) are sufficiently incentivizing storage. The State of Charge report found 1,766 MW to be the optimized deployment of storage, and further found that “[c]onsidering the Massachusetts ratepayer benefits alone of \$2.3 billion, 1,766 MW of storage provides net benefits to ratepayers with a benefit-cost ratio ranging from 1.7 to 2.4.”<sup>9</sup> The 2030 CECP should include an updated storage target for 2030 and identify strategies needed to achieve it.

**Recommendation: EEA should add an Action under Strategy E4 to evaluate by the end of 2022 whether existing programs such as SMART and Clean Peak are producing a sufficient deployment of energy storage.**

#### Addressing Challenges to Greater Solar Deployment

We note and appreciate that the 2030 CECP acknowledges that solar deployment within the built environment will be insufficient to meet our decarbonization goal, and thus substantial additional ground-mounted solar will be required. We also appreciate that the plan acknowledges that all forms of renewable generation and transmission face siting challenges. We agree that siting ground-mounted solar, onshore wind, offshore wind, and transmission lines requires the Commonwealth and communities to carefully balance multiple priorities. We must also note that the potential impacts of renewable generation and transmission pale in comparison to the impacts of fossil generation -- impacts which historically have been disproportionately borne by people of color and low-income communities. The COVID-19 crisis has tragically exacerbated the disparate burden of air quality impacts from fossil fuel use in multiple sectors, highlighting the urgency of transitioning to cleaner forms of energy.

In light of the 2050 Roadmap and 2030 CECP’s emphasis on regional energy markets, with substantial portions of the commonwealth’s future energy supplies coming from out-of-state sources such as Canadian hydropower, it is important to remember that renewable energy siting challenges do not stop at the Massachusetts border. The failure of the Northern Pass project to receive its necessary Certificate of Site and Facility from the New Hampshire Site Evaluation Committee, and fierce pushback to the proposed New England Clean Energy Connect transmission line in Maine are only two examples of the dangers of believing that Massachusetts can outsource its siting challenges.

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<sup>8</sup> *State of Charge: Massachusetts Energy Storage Initiative Study*, 2016, page ii.

<sup>9</sup> *State of Charge: Massachusetts Energy Storage Initiative Study*, 2016, page xi.

Fortunately, by setting a benchmark for how much renewable generation will need to be accommodated, the 2030 CECP provides an important starting point for engaging in an informed conversation about where it should be sited. As one of the longest operating companies in Massachusetts' solar industry, we are eager to have that conversation, and look forward to working with EEA, DOER, and MassCEC to implement the planning process called for in Strategy E4.

Even more than land use, the greatest challenge currently faced by the solar industry in Massachusetts is interconnection. While new approaches to grid planning and modernization are required, we firmly believe that distributed resources such as solar and energy storage are part of the solution, not the problem. We appreciate that the CECP includes an Action under Strategy E6 that "EEA will work with DPU, DOER, the Office of the Attorney General, and the Legislature to ensure the planning, development, and cost-benefit analysis for the Massachusetts distribution system are designed to maximize the ability of the Commonwealth to achieve Net Zero in 2050."<sup>10</sup> However, in order to stay on pace to achieve Net Zero by 2050, progress in these areas is urgently needed today. The challenges faced by renewable generators are extensively documented in the Department of Public Utilities' dockets 19-55 and 20-75; while we wait for decisions on crucial topics such as equitable cost allocation, hundreds of megawatts of renewable generation hang in the balance. In order to achieve the targets set out in the 2030 CECP, these issues must be urgently addressed.

**Recommendation: EEA, DPU, and DOER should act with urgency to address land use and interconnection challenges, establish equitable cost allocation frameworks, and incorporate distributed generation into system planning.**

Thank you for the opportunity to comment on the Interim Clean Energy and Climate Plan for 2030. We look forward to continuing to work alongside the Commonwealth to deploy clean energy and stay on track to achieve Net Zero emissions by 2050.

Sincerely,

Jessica Robertson  
Director of Policy and Business Development, New England  
Borrego Solar Systems, Inc.

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<sup>10</sup> *Interim Clean Energy and Climate Plan for 2030*, December 2020, page 43.



March 22, 2021

The Honorable Kathleen Theoharides,  
Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

**RE: Public Comment for Massachusetts Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides:

The Massachusetts Coalition for Sustainable Energy (MCSE)—representing nearly two dozen of the Commonwealth's largest business, employer, housing, labor, Chambers of Commerce, and trade associations—urges the Baker Administration to craft a Clean Energy and Climate Plan (CECP) that 1) prioritizes achievable and realistic strategies and technologies to reach our climate objectives by 2030 while 2) maintaining the Commonwealth's national leadership profile as a sustainable economic development role model in addressing climate change. We appreciate the opportunity to comment on this important public policy issue and thank you for the enormous amount of work and resource that you are dedicating to this urgent responsibility.

The CECP sets forth an important objective: achieving emissions reductions of 50% below 1990 baseline by 2030 – so that we will be on track to reach our goal of net zero emissions above the 1990 baseline by 2050 to mitigate the most dangerous effects of climate change. The MCSE supports this objective. However, we are under no illusions as to the scale of change that will need to take place – from drastically reducing our fossil fuel consumption, to requiring the development of new high-performance building codes, to an all-electric vehicle fleet, to assuring an adequate supply of reliable, affordable electric power in a future where our total electric load needs are expected to double. If we are going to get to 50% by 2030, less than 9 full years from now, we quite literally have one chance to get this right.

We offer the following thoughts and comments relative to the draft CECP:

- 1) **A Process That Meets the Scale of the Challenge.** Reducing emissions by nearly half within less than a decade is ambitious and will not be easy. The behavior of every citizen in Massachusetts will have to change in ways big and small. If not done with care, thought, and consideration for all communities in the Commonwealth, this shift has the

potential to inflict enormous economic harm that could lead to public backlash and deepened inequity. For these reasons, the MCSE believes sustainable climate policy—that reduces emissions from our buildings and vehicles and paves the way to widescale adoption of clean technology—must go hand-in-hand with sustainable economic development – including more densely clustered affordable housing and efficient public transportation and affordability to ensure widely shared economic benefits and job creation.

However, much work, listening, and outreach remains before we have a sustainable approach to climate policy. Too often, climate action in the Commonwealth has centered on unworkable or unwise proposals such as bans on hooking up natural gas to buildings or preventing fuel oil heating conversions – solutions that ironically deepen our reliance on high emitting sources of energy, leave us burning millions of barrels of oil when cold snaps occur, sending emissions and costs, soaring.

To date, much of what we see in the CECP appears to seek a non-ideological, data-driven set, and subset, of outcomes with an appropriate emphasis on stakeholder involvement and outreach. We welcome the establishment of thoughtful expert working groups like the HEET Commission. We applaud this approach and urge the Administration to assure that representation is inclusive of all societal sectors that are necessary to get us to our goals which go far beyond traditional environmental advocates. We also extend our desire to be a resource for you in reaching constituencies that are either unaware, or not yet fully aware, of the scale of change that needs to be contemplated and implemented.

- 2) **Building Heating.** When it comes to reaching net zero, our homes and businesses will be entering a new world between 2022 and 2030. We believe that this world requires sources of heating beyond heat pumps and electricity, such as hydrogen and renewable natural gas – and the input of an array of stakeholders who understand how building construction works at both commercial and residential levels. A sustainable energy policy cannot negate a sustainable housing and economic development policy.

As drafted, the Interim Clean Energy and Climate Plan for 2030 would reduce the use of natural gas, including ending incentives for new construction using natural gas starting in 2022. In many cases, this could make energy efficient housing construction uneconomic. For example, a 400-unit sustainable multifamily housing project has a much smaller energy footprint than a 400 single-family housing subdivision. The CECP should both recognize and quantify the benefits of such a development – and be flexible enough to see that blended zero emitting sources with natural gas or other fuel options would be far more viable economically than universally mandating electric heat pumps in a colder weather climate like Massachusetts, especially between now and 2030. The perfect should not be the enemy of the good.

- 3) **Transportation and Power Generation.** The CECP also calls for us to implement charging infrastructure to phase in the conversion of our vehicle fleet to 100% electric. This is highly ambitious and we ask the questions: what does the electric load demand look like to support the electrification of the entire private passenger vehicle industry, as well as the load associated with greater heating – and where is it coming from? Electrifying Massachusetts' cars will necessitate millions of vehicles sitting in garages, driveways, on-street parking, and parking lots charging at all hours, peak and off-peak. Instead of the low peak demand we experience today when the workday is over, load will increase exponentially in the evening. No one has yet modeled a demand curve on a daily, seasonal or annual basis – nor whether solar and wind using limited storage capacity will be able to meet this demand absent additional sources of energy such as natural gas, hydrogen or renewable natural gas. Our electric grid already has huge reliability challenges – and the electric power it provides is already the most expensive in the nation. Here again, we see the need to marry ambitious climate policy with responsible economic development and ensure the two needs inform each other.
- 4) **Existing Efficiency, Energy and Home Affordability Programs.** Transitioning to zero emissions will also require significant upgrades to existing homes and buildings. However, this only works if the scale of electrification does not increase consumer costs in a cost-prohibitive way. For instance, if a family or small business's electric bill goes from \$200 to \$300/mo. many may find that unpleasant but acceptable. However, if that bill rises to \$500 or \$600/mo., that becomes unworkable—both in terms of equity and our ability to get to scale—and effectively imposes a new tax on users.

At a time when natural gas remains the most popular heating source—even among users of electric heat—and solar installation remains uneven, it is important that the CECP harness popular programs like Mass Save which have helped countless families, vulnerable seniors and others upgrade to efficient appliances. If we use inflexible and rigid standards that do not account for issues of equity and feasibility, someone will end up footing an enormous bill – either homeowners, businesses or taxpayers.

- 5) **Housing & Consumer Choice.** Finally, we express to you our concern relative to housing costs and consumer choice in the Commonwealth. Regarding the former, a new building code that makes housing and building construction harder and more expensive would be devastating to Massachusetts' economy. The MCSE is concerned that wealthier communities may use a new, energy-based stretch building code as a way to limit housing production within its borders by ensuring that the cost of a new home remains out of reach for families of average means. This should not be allowed to happen, and we respectfully urge the sustained and programmatic inclusion of the home and commercial development building community in the development of any new building codes.



Reducing the Commonwealth's carbon footprint will require the widescale adoption of technology by the public and commercial sectors. Yet, as has been [documented extensively](#)—and recently—the enduring popularity of natural gas heating among consumers across Massachusetts and New England is largely due to its low emittance, affordability and reliability. Collectively, this has helped Massachusetts significantly reduce our reliance on dirtier fuels like oil and propane. As policymakers contemplate mandates that would require businesses and homeowners to adopt new and unfamiliar technologies—most of which, to date, have proven more costly and less reliable—we urge you to pay particularly close attention to the vital role consumer energy preferences will play in getting the Commonwealth to scale.

**Conclusion.** Ultimately, it comes down to what we hope to achieve with the CECP: emissions reductions or a successful transition to renewable energy. By focusing on 100% renewable energy now, with so many unknowns—from the efficacy of heat pumps at scale in cold weather to the electricity load—we risk achieving neither. In contrast, jumpstarting emissions reductions today using an array of clean and affordable technologies will allow us to accelerate the renewable energy deployment as we drive toward the end of the decade and, subsequently to 2050.

When we look back at this effort in 2030, whether we were successful will not simply have been a matter of whether we adopted ambitious energy and development standards – but also whether homeowners, businesses, industry, and developers were able to afford and adhere to these new standards. Though sustainable energy and sustainable development, we believe we can achieve both.

We thank you for your leadership and consideration.

Sincerely,  
**THE MASSACHUSETTS COALITION FOR  
SUSTAINABLE ENERGY**

20 Ashburton Place  
Boston, MA 02108



[www.ClimateActionNowMA.org](http://www.ClimateActionNowMA.org)

The Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs  
Secretary Kathleen A. Theoharides  
100 Cambridge Street, Suite 900  
Boston, MA 02114

March 22, 2021

Dear Secretary Theoharides,

Along with our colleagues at Climate Action Now, we thank you for this opportunity to comment and for your important work. The comments below are offered by the Regenerative Farming, Forests and Food Systems Group of CAN, that focuses on nature based solutions to restore ecosystem balance. This critical piece is often missing from the climate conversation and the strategic thinking process necessary to properly address the crisis; a process informed by the combination of ancient indigenous and current scientific knowledge that comprehends our dependency on, learns from, and works as part of earth's natural systems and with each other.

We implore you to emphasize this essential understanding in your planning.

The evolving science is recognizing that it is the earth's natural living systems of symbiotic multidimensional relationships that regulate all life support systems; the climate, weather, hydrology, the oxygenated atmosphere. What is not commonly known is that beyond carbon emissions and sequestration, it is the hydrologic processes working in sequence that primarily regulate heat from the planet. (Perhaps we've ignored that because we could model the CO2 rises but could not model the hydrological cycles)

The re-radiation is a key dominant factor in the greenhouse effect and green land cover enhances the latent heat cooling effect through transpiration. In addition to reducing CO2 emissions and maximizing carbon sequestration, land management, such as through keeping the soils healthy, cool, moist and protected and by restoring the earth soil carbon sponge/ structure and microbiology free of chemical toxicity are areas where we have the greatest agency to restore balance.

Our true 'Common wealth' comes from and is dependent on natural ecosystem function. We are asking you for the bold action required by humans to protect and restore degraded lands that is essential to continued life on this beloved earth.

## Comments for Clean Energy and Climate Plan 2030

From Regenerative Farming, Forests and Food Systems group of CAN, Western MA

### Building and Heating Sector

- **Recommendation:** Ensure that woody biomass is specifically excluded from any category of sustainable, cost-effective clean energy, including biofuels (i.e., p. 33, 4<sup>th</sup> bullet). Woody biomass burning and trash burning should be removed from the APS and the RPS.
  - Details: Biomass is neither clean nor sustainable, negatively impacts human health and is inconsistent with Net Zero by 2050 and 45% reduction in greenhouse gas (GHG) emissions by 2030.<sup>1, 2</sup> Subsidizing these carbon emitting fuels is in direct opposition to the goals of the Massachusetts Global Warming Solutions Act (GWSA) to reduce carbon emissions,<sup>3</sup> and the Intergovernmental Panel on Climate Change.<sup>4</sup>
  - The CECP report itself recognizes that 100% of carbon contained in wood is released into the atmosphere when it is burned (See Strategy L3, p. 51)
    - Forest regrowth and carbon-debt payback is uncertain and takes many decades to a century or more
    - Climate damage is not reversed even if the forest eventually regrows

### Energy Sector

- **Recommendation:** Ensure that NO forests, wetlands and other carbon-rich lands and soils will be utilized for purposes of solar installations. (pp. 41-42)
  - Details: Solar panels must be sited on rooftops, capped landfills, parking lots, “grey fields” and other already-developed areas, not on Massachusetts’ natural carbon sinks: forests, wetlands, and grasslands. If the Commonwealth destroys these natural carbon sinks for solar development, not only will these existing natural sources of carbon drawdown and sequestration be lost, but the carbon stored in them will be released into the atmosphere, exacerbating the climate crisis. Furthermore, if left undisturbed, these natural living systems would draw down and store increasing amounts of carbon over the years.
- **Recommendation:** Compile data, such as solar maps and other solar/prior land use data collected and developed by Clark University, on PV installations across the Commonwealth, including the acres of forest, wetlands, prime farmland and other green spaces and ecosystem habitats lost to solar development to date.

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<sup>1</sup> Mary S. Booth, Brendan Mackey, and Virginia Young, “It’s Time to Stop Pretending Burning Forest Biomass Is Carbon Neutral,” *GCB Bioenergy* 12, no. 12 (December 1, 2020): 1036–37, <https://doi.org/10.1111/gcbb.12716>.

<sup>2</sup> Mary Booth, *Paying to Cut and Burn Forests: Is This Really What We Want for Renewable Energy?*, Protecting Massachusetts Forests, 2020, <https://www.youtube.com/watch?v=XcZWTjj7yUs>.

<sup>3</sup> Massachusetts Department of Environmental Protection, “Global Warming Solutions Act,” n.d.

<sup>4</sup> Intergovernmental Panel on Climate Change, “Global Warming of 1.5 °C,” n.d., <https://www.ipcc.ch/sr15/>.

According to Clark University's research, almost 7,700 acres of land has been cleared for solar development, 49% of which had been forested.

- Data collection and analysis are needed to realign incentives and disincentives to prioritize solar development on the least environmentally sensitive land and on disturbed and developed sites.

## Natural and Working Lands Sector

- **Recommendation:** Include regenerative practices that maximize healthy soils' ability to mitigate climate change and effectively drawdown and sequester carbon as an integral part of the CECP.
- **Recommendation:** Support funding and education for restoring ecosystems and opportunities to increase photosynthetic activity and community engagement wherever possible, such as urban, community and school gardens.
  - Details: The CECP barely mentions the critical role healthy ecosystems and regenerative land management, such as in agriculture, landscape management, lawns and gardens etc., play in stabilizing the climate.
  - Urban and community eco/regenerative farms and gardens help address not only the climate catastrophe but the contributing and related crisis such as land degradation, chemical toxicity, environmental justice communities' food justice, food and soil sovereignty, public health; physical and mental, economic injustice.
  - Photosynthesis and healthy living soil impacts the carbon and water cycles which when out of balance leads to climate derangement, flooding, droughts, fires and temperature extremes.<sup>5</sup>
- **Recommendation:** Support, incentivise and enforce mass-scale healthy, aerobic composting programs across the Commonwealth in which every individual can participate.
  - Details: Decomposing food waste in anaerobic conditions, as is typical when food waste is dumped into landfills, releases methane, a potent greenhouse gas.<sup>6</sup> Community-based managed composting in aerobic conditions can help to mitigate this problem, particularly in urban areas.
- **Recommendation:** Institute policies that support a just transition to aid farmers, homeowners, landowners and land stewards to adopt regenerative, eco-agricultural practices such as ending the use of chemical fertilizers and pesticides, no-till farming, composting, use of perennial diverse cover crops, agro-forestry, and silvo-pasture.

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<sup>5</sup> United States Department of Agriculture, "A Hedge against Drought: Why Healthy Soil Is 'Water in the Bank,'" February 21, 2017, <https://www.usda.gov/media/blog/2015/05/12/hedge-against-drought-why-healthy-soil-water-bank#:~:text=%E2%80%9CWith%20better%20soil%20structure%2C%20infiltration,of%20its%20volume%20in%20water.>

<sup>6</sup> Kishneth Palaniveloo et al., "Food Waste Composting and Microbial Community Structure Profiling," *Processes* 8, no. 6 (June 1, 2020), <https://doi.org/10.3390/pr8060723>.

- Details: Conventional agricultural practices, such as tilling, leaving soil bare, use of synthetic fertilizers and chemical pesticides, etc., destroys soil structure and biology, thus compromising the soil's ability to mitigate floods and droughts and store carbon.<sup>7</sup>
- **Recommendation:** Ensure public lands (both state and municipal) remain intact to develop into mature, old growth forests that provide essential ecoservices.
  - Details: Consistent with the Biden Administration's executive order to protect 30% of America's land and oceans, Massachusetts should set aside and permanently protect from logging its 610,000 acres of state-owned forests. Leaving our state lands "forever wild" (proforestation) will help preserve biodiversity, maximize carbon drawdown and storage, protect critical watershed areas, and preserve the land for public enjoyment.<sup>8</sup> Similarly, Massachusetts must also develop policies and programs to help cities and towns preserve the 300,000 acres of municipal and county forests as "forever wild."
- **Recommendation:** Update forest management practices to reflect evolving understanding based on forest ecology versus an extraction model.
  - Details: Large diameter trees sequester and store significantly more carbon in a year than smaller trees. While large trees may comprise 3% of total tree mass of a forest, they may contain 46% of the total above-ground carbon
- **Recommendation:** Establish and enforce oversight and evaluation of all forest management projects
- **Recommendation:** Transition to and teach a philosophy of minimal logging rather than "forest management" as it is currently practiced.
  - Details: This pertains to privately-owned lands and the Private Lands Forestry Program in the Department of Conservation and Recreation as well as public lands.
  - The CECP report notes that "*ensuring the continued health and viability of Massachusetts' existing 3.3 million acres of forested land is the primary strategy to ensure this valuable sequestration potential is available in 2050 and beyond.*" (p. 49). Currently used "sustainable" management practices clearcut and fragment forests in the name of promoting forest health by removing infected and diseased trees, promoting successional habitat,

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<sup>7</sup> Kathy Castor, "Solving the Climate Crisis : Opportunities in Agriculture : Hearing before the Select Committee on the Climate Crisis, House of Representatives, One Hundred Sixteenth Congress, First Session, Hearing Held October 30, 2019.," Pub. L. No. Serial No. 116-13, § Select Committee on the Climate Crisis (2019), <https://www.govinfo.gov/content/pkg/CHRG-116hrg39635/pdf/CHRG-116hrg39635.pdf#?>

<sup>8</sup> William R. Moomaw, Susan A. Masino, and Edward K. Faison, "Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good," *Frontiers in Forests and Global Change* 2 (2019): 27, <https://doi.org/10.3389/ffgc.2019.00027>.

bird habitats, increasing fire resistance, etc.<sup>9</sup> This actually destroys ecosystem health and weakens the potential of our woodlands to sequester carbon and provide ecoservices, such as clean water, clean air and wildlife habitat.<sup>10</sup>

- **Recommendation:** Develop policies to increase incentives for private forest owners to maintain them in an undisturbed state.
- **Recommendation:** Place a moratorium on logging (forest management) on public lands (state and municipal) until research on the impact of such practices on carbon sequestration and environmental impact is complete (p. 51)
  - Details: Climate Action Now, Western MA commends EEA for its commitment to “*commission additional forest carbon sequestration research, building upon the land use analysis in the 2050 Roadmap, to assess the long-term impacts of sustainable forest management practices*” (p. 50). A moratorium on state-sponsored logging as it is currently practiced until such research is completed will allow for Forestry Best Management Practices to be updated according to principles of present-day climate and environmental science.
- **Recommendation:** Prioritize a just transition for people whose livelihoods depend on logging, including retraining and education based on evolving knowledge of forest ecology.
- **Recommendation:** Prioritize and incentivize conservation in building practices to minimize the use of forests for wood products.
  - Details: Although there will continue to be a demand for wood as a building material, the Commonwealth must incentivize conservation, alternate materials, and recycling. A tree can store carbon for hundreds of years, more and far longer than wood products, but when it is cut for wood or burned for biomass that carbon is released quickly into the atmosphere.

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<sup>9</sup> Michael Kellett and Bill Stubblefield, *Our Massachusetts Forests: To Cut or Not to Cut*, Forest Speakers Series, 2020, <https://www.youtube.com/watch?v=cuaJB7rRjhs>.

<sup>10</sup> Foster David R. et al., “Wildlife Dynamics in the Changing New England Landscape,” *Journal of Biogeography* 29, no. 10/11 (October 1, 2002): 1337–57.

More References available upon request

*Thank you for the opportunity to submit comments on the CECP and for your consideration of these recommendations. Please also see comments from the Legislative Committee of CAN attached to the same email message.*



[www.ClimateActionNowMA.org](http://www.ClimateActionNowMA.org)

The Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs  
Secretary Kathleen A. Theoharides  
100 Cambridge Street, Suite 900  
Boston, MA 02114

March 22, 2021

Dear Secretary Theoharides,

Climate Action Now of Western Massachusetts (CAN) thanks you for the opportunity to comment on the Interim Clean Energy and Climate Plan for 2030, that will determine statewide energy and climate policy for the next nine years, the most critical time for avoiding the worst devastation of the climate crisis. The comments below are offered by the Legislative Working Group of CAN that focuses on energy policy.

Given the immediacy of the need to drop emissions by 2030, the plan's greenhouse gas (GHG) reduction targets are too heavily weighted in the years 2025-2029, posing a considerable risk that the 2050 net zero emission reduction target will not be achieved. We strongly support the legislature's commitment, in the Next-Generation Roadmap, to raise the emission reduction goals to at least 50% by 2030. We believe 50% is feasible and appropriate and recommend that this goal be incorporated into the final 2030 CECP. Strong climate policy and emission reduction targets avoid costly disaster recovery while expanding economic growth and jobs in energy efficiency and renewables and lowering statewide healthcare costs because of cleaner, healthier air.

For the plan to be implemented in a way that reflects its stated commitment to equity, it should be centered on addressing environmental injustice among minority and low-income communities who bear the burden of fossil fuel pollution. The plan should use the Climate Justice Working Group, with representatives who have environmental justice and equity expertise, as a model for the ongoing participation in the implementation of the plan, combined with prioritizing robust funding for clean technology transitions and workforce development for EJ residents.

We suggest additional guiding questions: How will this plan frontload emission reductions to accelerate a rapid drop in GHGs earlier in this decade, as needed to reach the 2030 targets? What methods will EEA use to track current progress every 2-3 years at most, to allow for adjusting policies and implementation? What alternative strategies will EEA develop to draw from if needed to meet its emission targets?

Unfortunately, the plan also lacks specific policy details on how to achieve its targets. Below are CAN's recommended details to be added to the plan.

## Transforming our Transportation Systems

By 2023, equitably implement the Transportation and Climate Initiative (TCI):

- For TCI to be equitable and not negatively impact lower and middle income (LMI) residents, codify that these residents are protected from spending a higher percentage of income on fossil fuels, which they can ill-afford.
  - By summer 2021, establish and empower the equity advisory board to shape TCI implementation and create a public engagement/decision-making process on how TCI revenue will be spent.
  - Invest at least 70% of TCI-P funds in resources for transit-dependent and overburdened communities. such as expanded electric regional public transportation, electric rail, EV rebates, EV charging stations in EJ neighborhoods, and improved access to broadband that would decrease the need for additional vehicle miles traveled (VMTs) for work, education, healthcare, and other needs increasingly available online.
- Allow TCI funds to be allocated only to measures that address transportation-related emission reductions.
- Establish the conditions and interim targets for reducing the TCI emission cap, to ensure that it provides adequate incentives to achieve 2030 and future GHG emission reduction targets.
- Set policies to ensure that the emission cap does not allow extra fossil fuels to enter the state, particularly since some neighboring states have not committed themselves to joining TCI.
- Develop and implement policies and programs to accelerated EV adoption in the next 5 years, to facilitate reaching the 2050 Roadmap goal of 1 million EVs by 2030.
  - Recommend specific EV rebate levels to achieve GHG emission reductions by 2030, 2040 and 2050.
- Adopt California Advanced Clean Cars II Standards by 2021.
- Commit to 100% electrification of transit bus fleets and school buses by 2030, state and municipal fleets by 2035, and all commuter rail by 2035.
- Evaluate additional options for generating the revenue, such as congestion charges in urban areas, needed to support the enormous transportation transition that meets emission targets.
- Reduce, rather than stabilize, vehicle miles travelled (VMT) through 2030.



- Invest in grid infrastructure to enable widespread EV charging and thus rapid EV adoption and specify funding required to provide electric vehicle supply equipment (EVSE) incentives to build out the charging infrastructure.
- Establish a group purchasing program to lower costs for state/municipal EV procurements by the end of 2021.
- Prioritize electrification of medium and heavy duty ZEVs, delivery vehicles and other fleets with high VMTs.
- To accelerate EV adoption especially among LMI residents, in 2021:
  - Expand eligibility for MA rebates to used EVs.
  - Provide rebates at the point of sale by the end of 2021, as being piloted by DOER, to ease the financial burden of more costly EVs.
  - Because LMI residents are less likely to be able to take advantage of federal tax credits for EVs, by 2022, set MA rebates at higher levels for LMI residents.
  - Include vehicle exchange programs (e.g., cash for clunkers) for LMI residents.
- Expand group-buy programs, such as Drive Green, to lower consumer EV prices.
- Require utilities to establish and promote cost-saving Time-of-Use rate structures that enable EV owners to charge their vehicles at times when the electricity is cheaper and cleaner (e.g., off-peak or periods of high renewable power generation), and disincentivize charging during peak power demand.
- In 2021, analyze alternative electric utility rate structures and barriers to installing Direct Current Fast Charging (DCFC) stations.
- Since demand for EVs will depend on access to charging stations at homes, workplaces, commercial locations, transit hubs, long-term parking facilities and along highways, establish targets for 2025, 2030 and 2035 for the number of charging stations available to the public, including goals for residential, multifamily, public and workplace locations and funding needed to build out this infrastructure quickly.
- Because landlords have little financial incentive to install EVSE, provide incentives for multi-family property owners to purchase and install EVSE at a target percentage of parking spaces provided for their tenants and pair these incentives with penalties for non-compliance.
- Implement a robust education and outreach program to encourage consumers to buy EVs.

- By 2024, to reduce VMTs, expand and improve regional transit, MBTA, commuter rail, and micro-mobility (i.e., on-demand transportation, reservable transportation in small vans), combined with policies such as development near commuter rail lines into EJ communities, multi-family zoning, walking and biking options.
- Invest in east-west rail across the Commonwealth, an alternative to driving.

## **Transforming Our Buildings**

- Establish a permanent Commission & Task Force on Clean Heat by May 2021 to set mandatory, statewide GHG emission limits in the building sector by 2022, and enforcement starting by 2025, with a declining limit on CO<sub>2</sub>e from heating suppliers.
- Require investor-owned utilities to take climate into account when determining the cost-effectiveness of their energy efficiency programs (i.e., Mass Save and Community Action).
  - Align the Mass Save program with emission goals, removing incentives for fossil fuel appliances by 2022 and adding incentives to replace appliances before end of life.
- By the end of 2022, prioritize establishing a comprehensive program, with annually-increasing targets, for deep weatherization and related health and safety repairs and upgrades, and heating/cooling electrification, targeting LMI and EJ residents and businesses, renters, and non-English speakers. Expanded incentives to lower barriers to electrification for this population will likely be necessary.
  - Address the localized public health impacts of other combustion pollutants (e.g., PM<sub>2.5</sub>, ozone, NO<sub>x</sub>, etc.) by conducting annual reviews of tracked emissions from the electric sector and using these reviews to compare impacts in EJ communities relative to non-EJ communities, to inform policy implementation.
- Require Green Communities to adopt a non-combustion, high efficiency net zero stretch energy code no later than 2022. Establish net zero as a statewide base code adoption by 2025 and assure GHG emissions of building materials are included in the net zero calculation.
  - Postponing statewide adoption of this code until 2028 will result in buildings with high emissions for many decades to come, which will require retrofits.
  - Take into account the lifecycle GHG emissions of high Global Warming Potential (GWP) building materials when calculating the GHG emissions of a new building and of retrofits (e.g., including the high GWP emissions of hydrofluorocarbons [HFCs] in spray foam insulation, air source heat pumps (ASHPs), and concrete).
    - If the GHG emissions of building materials are not accounted for, the upfront GHG emissions from these materials can cause a building to add significant and immediate GHG emissions that are not recouped for many decades by the building's operational emission savings.
- Establish a workforce development program to train architects, builders, tradespeople, and building inspectors to install and operate electrified, highly energy efficient buildings.

- Create workforce development and training programs with labor partners, to ensure good paying, union certified jobs in the building energy upgrade sector.
- Increase consumer incentives for clean heating technology.
- Direct the Department of Energy Resources to add 4 seats for energy efficiency experts to the Board of Building Regulations and Standards.
- By 2025, establish a large-scale statewide financing program or green bank for the building sector, that includes funding support for, but not limited to, the extensive costs for deep energy retrofits, equitable workforce development, local and district-scale projects, renewable energy generation, and projects that advance both GHG reductions and climate adaptation or resilience. Also require removal of barriers to building decarbonization in other state funding/financing programs, such as the Community Preservation Act and Massachusetts School Building Authority.
- With the need for massive workforce expansion to rapidly accelerate the weatherization of buildings “driving the most aggressive pace possible in the building sector” and the rapid installation of electric heating, recognize and make specific plans to focus workforce training opportunities in LMI and EJ communities.

### **Transforming Our Energy Supply**

- By 2028, conduct a review of the impact of clean energy incentive programs on the ability of the Commonwealth to meet 2050 net zero mandates, to guide necessary adjustments.
- Fully execute and expand the Commonwealth’s solar programs and offshore wind procurements and raise the clean electricity standard to 100% by 2035.
  - Set a minimum target of 6 GW offshore wind installed by 2030.
  - Set a minimum target of 9,300 MW of solar by 2030, incentivizing solar development near existing loads.
- By 2022, given the enormous need for expansion of ground mounted solar in order to achieve the plan’s goals, further incentivize development of solar on “built” or disturbed land and on rooftops, while decreasing or eliminating incentives on undeveloped land in order to severely deter solar development that replaces forestland, agricultural land, and other ecosystems such as wetlands, which are insufficiently protected under the SMART program.
- Increase the RPS by 3% annually, and by 5% 2025-2030, as in climate bill S.9.
- By 2022, remove clean energy incentives for biomass and solid waste (waste-to-energy) combustion for all EEA programs, including the RPS, APS, CES, and CPS.
- Revise the CES to reach 100% electricity from non-emitting sources by 2035.
- Create targeted incentive programs for local renewable electricity for LMI and EJ residents.

- Ensure that MLP electricity sources are decarbonized on pace with investor-owned utilities.
- By 2022, assess grid infrastructure upgrade needs for electrification of buildings, transportation and significant additional renewable generation, and start upgrades in 2023, prioritizing investment in low income communities, at no costs to these residents.
  - The Department of Public Utilities (DPU) should ensure that LMI customers do not experience increased energy costs as a result of investments in grid modernization.
- In 2021, remove all net metering caps to encourage rapid expansion of solar power and its local, high quality jobs, jobs which have been lost due to the existence of net metering caps.
- Adopt PV panel and battery storage recycling regulations, as both contain hazardous materials that will need recycling at end of their useful life, especially as the life expectancy of PV panels is becoming shorter.
  - PV owners should be provided with incentives for decommissioning and safe handling and recycling of the hazardous and re-usable materials in these products.
- Require utilities to cover or drastically reduce the charges for solar interconnections.
- Immediately identify and commit to ways to expand access and incentives for solar power and solar hot water to EJ and LMI residents and affordable housing units, removing financial barriers to access for these customers.
  - Reserve at least 50% of the financial incentives, at no-cost, for clean energy investments for use by EJ and LMI electric customers and create and enhance incentives and regulatory carve-outs to encourage development of community shared distributed energy resources, such as microgrids, and other clean energy options serving these consumers.
- Revise EEA regulations to stop additional procurements of large scale Canadian hydropower as a clean energy source, due to its destructive impact on indigenous communities and on forested lands.
- Require electric utilities to implement Time-of-Use (TOU) electricity pricing and provide consumers with no-cost home energy monitors, to incentivize consumer electric use outside of peak and high demand periods. TOU pricing reduces consumer electric costs.
- For the huge expansion of offshore wind, make specific plans to focus workforce training opportunities in LMI and EJ communities who will benefit from the increase in local jobs.
- Accelerate approval by the DPU of Community Choice Aggregation (CCA) plans choosing Class I renewable energy at a higher rate than required of utilities and, to incentivize participation in CCAs, give highest priority to allocating Green Communities grants to municipalities with CCAs.

- Require DPU to approve ambitious CCA plans that include building local renewable generation as a part of their mission and operations.

### **Mitigating Other Sources of Emissions**

- To achieve more rapid reductions of extremely high Global Warming Potential (GWP) hydrofluorocarbon (HFC) “F-gases,” support R&D of new products, optimize paths to commercialization of needed new products and support job skill development associated with these products and safe handling practices, by the end of 2021.
- Establish regulations such as annual inspections, proper installation that checks for refrigerant leaks, repair, and disposal requirements, to minimize HFC releases in commercial and residential systems.
  - The [majority of HFCs](#) are released by system leaks and at the end of life of products with HFCs, when HFCs are not destroyed.
- Evaluate the availability by 2022 for low and zero-GWP alternative refrigerants for heat pumps and future technology, especially as the Commonwealth promotes electrification of heating and cooling, and, as soon as alternatives become available, promulgate requirements for use of these products.
- Eliminate methane leaks from natural gas distribution pipelines and eliminate the use of natural gas by 2050.
- Ensure best practices and enforcement regulations are in place around solid waste, wastewater, and agricultural emissions.

### **Additional recommendations**

- Support funding and education for restoring ecosystems and opportunities to increase photosynthetic activity and community engagement wherever possible, such as urban, community and school gardens.
- Include monitoring, reporting and enforcement provisions for carbon sequestration offset markets, in addition to the measurement, accounting, and market frameworks in the plan.
- Establish a workforce task force to address employment needs, skills development and training, displaced worker retraining, public school education curricula, community college and 4-year college courses to support the transition to a clean economy.
- Lastly, the state needs to educate, on an on-going basis, legislators, local officials, businesses and the public about the overall goals of the transition to a green economy, the rationale behind the steps being taken, the specific steps to be taken along the way, how they will affect them, and what the state is doing to include everyone in a successful transition.

Thank you for the opportunity to submit comments on the CECP and for your consideration of these recommendations. Please also see comments from the Farm, Forest and Food Systems Working Group of CAN attached to the same email message.

Sincerely,

Irvine Sobelman  
On behalf of Climate Action Now, Western Mass



**MEGA DAMS**  
**MEGA DAMAGE**  
**REJECT CANADIAN HYDRO**

**NORTH AMERICAN MEGADAM RESISTANCE ALLIANCE**

Protecting rivers & communities by resisting  
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March 22, 2021

Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
Commonwealth of Massachusetts  
100 Cambridge Street, Suite 900  
Boston, MA 02114

**By email only to: [gwsa@mass.gov](mailto:gwsa@mass.gov)**

**Re: Massachusetts Interim Clean Energy and Climate Plan for 2030 and  
Decarbonization Roadmap: Comments**

Dear Ms. Theoharides,

The North American Megadam Resistance Alliance (“NAMRA”) submits the following comments on Massachusetts’s interim Clean Energy and Climate Plan for 2030 (“2030 CECP”) and the Decarbonization Roadmap (“the Roadmap”). The 2030 CECP provides details on the actions the Commonwealth proposes to take through the 2020s to ensure that statewide greenhouse gas (“GHG”) emission limits are 45% below the reported 1990 level. The 2030 CECP is prepared in coordination with the development of the 2050 Decarbonization Roadmap

such that the strategies, policies, actions outlined in the plan aims to help the Commonwealth achieve net zero GHG emissions by 2050. This interim report builds upon the 2010 publication of the Clean Energy and Climate Plan for 2020 as part of the Global Warming Solution Act's ("GWSA") implementation policies. The Executive Office of Energy and Environmental Affairs ("EEA") is soliciting public comment before finalizing the 2030 CECP.

As detailed below, the CECP and Roadmap proposals are flawed because Massachusetts fails to account for GHG emissions from electricity used in Massachusetts and generated elsewhere -- specifically by Canadian hydroelectricity -- in its 2030 CECP reduction strategies. Canadian hydropower imports account for about 19% of New England's electricity usage as of 2019 according to the Independent Services Operators of New England ("ISO-NE"). Neither Massachusetts nor ISO-NE account for the greenhouse gas emissions from electricity generated by Canadian hydropower and used in New England. Nor are these emissions accounted for in Canada. This is a GHG accounting loophole at a time of climate crisis. Perpetuating this loophole under the CECP and Roadmap contravenes the GWSA by undercounting GHG emissions both in the 1990 baseline inventory and every year after that. As a result, Massachusetts electricity usage actually emits more GHG than what is reported. This makes Massachusetts's GHG reporting inaccurate and paints a false picture of the state's actual GHG emissions.

## **I. Factual Background**

From 2000-2008, Massachusetts imported about 4,748,725 megawatt hours of electricity from Quebec Province in Canada.<sup>1</sup> Massachusetts has developed climate policies over the past decade to help drive emission reductions, particularly within the electricity sector. The 2050

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<sup>1</sup> See MASS. EXEC. OFF. OF ENERGY AND ENV'T AFF, STATEWIDE GREENHOUSE GAS (GHG) EMISSIONS BASELINE AND PROJECTION UPDATE (2020) (table depicting data from 2000-2008 on Massachusetts's share of Quebec net electricity exports).



Decarbonization Roadmap calls for a continued transition away from carbon intensive electricity sources and toward imported Canadian hydropower and high-voltage interstate transmission lines.<sup>2</sup> The roadmap falsely describes hydropower as “a clean energy generation resource” that is “highly controllable and effectively dispatchable.”<sup>3</sup> In an effort to shift the state from a fossil fuel-dependent grid to a renewable energy grid, Massachusetts passed *An Act to Promote Energy Diversity* in 2016. In part the Act requires utilities to solicit 9.45 terawatt hours per year of “clean energy generation.”<sup>4</sup> In response, utilities contracted with Central Maine Power (“CMP”) for the delivery of hydropower via high-voltage transmission lines through the New England Clean Energy Connect (“NECEC”) project.<sup>5</sup> The contract was approved by the Department of Public Utilities.

The NECEC project is slated to deliver Canadian hydropower generated by 63 hydroelectric generation stations in Eastern Canada, including 1/6 of which is generated at the Upper Churchill Falls facility in Labrador/Newfoundland Province. The Canadian hydropower industry is owned by the individual provinces making them state-run monopolies. The Canadian Government and the hydropower monopolies market this hydroelectricity as “clean.”<sup>6</sup> In fact, peer reviewed science shows that the emissions from Canadian hydropower can be on par with fossil fuels. This electricity destroys rivers, biodiversity and is resulting in ongoing environmental racism according to Indigenous communities from whose land most of this electricity is taken without compensation and without consent.<sup>7</sup>

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<sup>2</sup> MASS. EXEC. OFF. OF ENERGY AND ENV'T AFF., MASSACHUSETTS 2050 DECARBONIZATION ROADMAP at 55 (2020)

<sup>3</sup> *Id.* at 63.

<sup>4</sup> MASS. EXEC. OFF. OF ENERGY AND ENV'T AFF., INTERIM 2030 CECP 35 (2020).

<sup>5</sup> *Id.* at 8, 35.

<sup>6</sup> *Hydro-Quebec Has Left Quebec's First Nations Behind*, BANGOR DAILY NEWS (Feb. 7, 2021), <https://bangordailynews.com/2021/02/07/opinion/contributors/hydro-quebec-has-left-quebecs-first-nations-behind/>.

<sup>7</sup> See, [www.quebechydroclash.com](http://www.quebechydroclash.com) and [www.50yearsastdue.ca](http://www.50yearsastdue.ca) for positions of the Atikawekw, Pessamit Innu and Anishnabe Coalition and the Innu Nation of Labrador opposing the export of Hydro-Quebec electricity to the U.S. without compensation.

HydroQuebec's electricity generation has been negatively impacting Indigenous communities since the 1970s and the new dams built for export to Massachusetts via NECEC perpetuate what they describe as cultural genocide. Flooding lowlands to create hydropower storage reservoirs has led to the release of methylmercury from plants and soil which poisons wild caught foods including fish, duck, and seals relied on for physical and spiritual survival by groups such as the Pessamit Innu First Nation and the Innu and Inuit.<sup>8</sup> The dams and associated related infrastructure such as transmission corridors have shifted migratory patterns for fish and key game animals hunted by Indigenous people, further disrupting their food sources.<sup>9</sup> Construction and operation of hydroelectric facilities has destroyed and continues to destroy ancestral lands and traditional livelihoods of Indigenous people in Eastern Canada, including communities in Labrador impacted by Hydro-Quebec's production and export of one-sixth of its electricity supply generated at the Upper Churchill facility. The Phase 1 Lower Churchill project, the Muskrat Falls dam, was built without the consent of all Indigenous community members and over the opposition of the Grand Riverkeeper of Labrador, Inc. and a wide network of social justice, environmental and Indigenous groups. Massachusetts' refusal to acknowledge the climate injustices and environmental racism perpetuated by Hydro-Quebec' electricity imports is at odds with the professed "climate justice" and "environmental justice" pronouncements of the CECP and Roadmap and Governor Baker's own policies. Importing more of this hydropower via NECEC so HydroQuebec, a state-owned monopoly, can grow its profits by selling to U.S. consumers is not acceptable.<sup>10</sup>

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<sup>8</sup> *Id.*; see also *Hydro-Quebec and the Mercury Issue*, HYDRO-QUEBEC, <https://www.hydroquebec.com/sustainable-development/specialized-documentation/mercury.html> (last visited March 12, 2021) (HydroQuebec conducted a study and acknowledged the increase of mercury levels in its reservoirs, but nonetheless concluded that "the health benefits of eating fish far outweigh the mercury-related risks").

<sup>9</sup> *Hydro-Quebec Has Left Quebec's First Nations Behind*, *supra* note 3.

<sup>10</sup> See *id.* (discussing how HydroQuebec makes billions of dollars each year by profiting off its illegitimate occupation of indigenous land).

The NECEC Canadian hydropower import proposal faces strong public opposition and has divided government officials.<sup>11</sup> Corridor opponents in Maine have collected 80,506 certified signatures for a state-wide referendum to require legislative approval for any electrical power line exceeding 50 miles.<sup>12</sup> The NECEC project requires 53 miles of new corridor and will cut through treasured mountain areas of Northern Maine.<sup>13</sup> Much of the controversy surrounds the concern that NECEC will precipitate irreparable environmental damage to Maine's prized landscapes with little return for Maine residents.<sup>14</sup> In October 2020, the Natural Resources Council of Maine, Sierra Club Maine, and Appalachian Mountain Club filed a federal lawsuit in the U.S. District of Maine challenging the U.S. Army Corps of Engineers' Environmental Assessment of the NECEC project.<sup>15</sup> The case is currently before the First Circuit which granted the plaintiffs' injunction pending appeal on January 15, 2021.

## II. Legal Background

Massachusetts passed the GWSA in 2008 to establish a comprehensive regulatory program that would address climate change through ambitious GHG reduction targets.<sup>16</sup> The overarching goal of the GWSA is to reduce emissions 10-25% below statewide 1990 levels by 2020 and at least 80% below by 2050. EEA has also adopted a statewide target of Net Zero GHG

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<sup>11</sup> See *PUC's Decision on CMP Corridor Deeply Flawed*, NAT. RES. COUNCIL OF MAINE (Apr. 11, 2019), <https://www.nrcm.org/maine-environmental-news/pucs-decision-cmp-corridor-deeply-flawed/> (state-wide poll found that 65% of Mainers oppose the project).

<sup>12</sup> If the legislature passes the referendum, it would specifically prohibit a line where CMP wants to build. Don Carrigan, *Threshold Met For Referendum on \$1B Utility Corridor Project*, NEWS CENTER MAINE (updated Feb. 22, 2021) <https://www.newscentermaine.com/article/news/local/threshold-met-for-referendum-on-cmp-1b-utility-corridor-project/97-bcbc5b41-5ac2-41f9-b655-c6571a652bcd>.

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> *Environmental Groups File Lawsuit Challenging Army Corps for Indefensible CMP Corridor Analysis*, NATURAL RESOURCES COUNCIL OF MAINE (Oct. 28, 2020), <https://www.nrcm.org/news/lawsuit-challenging-army-corps-cmp-corridor-analysis/>.

<sup>16</sup> See *Global Warming Solutions Act Background*, Exec. Office of Energy and Env't Affairs, <https://www.mass.gov/service-details/global-warming-solutions-act-background>.

emissions by 2050 which Governor Baker announced in January 2020.<sup>17</sup> To help achieve these goals, the GWSA provides a framework for Massachusetts to promulgate reporting mandates for large GHG-emitting facilities and establish a baseline assessment of statewide GHG emissions.<sup>18</sup>

Under Section 3(a) of the GWSA, EEA is required to adopt “an interim 2030 emissions limit accompanied by plans to achieve this limit in accordance with said section 4; provided, however, that the 2030 interim emissions limits shall maximize the ability of the commonwealth to meet the 2050 emissions limits.”<sup>19</sup> Section 4 outlines several factors to be considered by the Secretary in developing the targets, such as the feasibility of the measures to comply with the emissions limit, the potential economic and noneconomic benefits of reduction measures, and the relative contribution of each source to statewide GHG emission levels.<sup>20</sup> As implied by the language of Section 3(a), the priority of the provision is to ensure that the 2030 CECP sets Massachusetts on track to achieve its 2050 emission targets.

Section 2(5) of the GWSA states that Massachusetts’s Department of Environmental Protection (“DEP”) shall establish reporting requirements for GHG emissions from all consumed electricity sources.<sup>21</sup> This includes “transmission and distribution of line losses from electricity generated within the commonwealth or imported from outside the commonwealth.”<sup>22</sup> Thus, GHG emissions from facilities other than those located in Massachusetts should be reported since those sources contribute to the total consumption of electricity in the state. Further, the statute does not distinguish between national and international sources of electricity. The NECEC contract, approved by the Department of Public Utilities with the support of the Department of

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<sup>17</sup> MASS. EXEC. OFF. OF ENERGY AND ENV’T AFF., INTERIM 2030 CECP 4 (2020).

<sup>18</sup> See Global Warming Solutions Act Background, Exec. Office of Energy and Env’t Affairs, <https://www.mass.gov/service-details/global-warming-solutions-act-background>.

<sup>19</sup> GWSA, § 3(b)(2) (2008).

<sup>20</sup> *Id.* §§ 4(b), (d), (e).

<sup>21</sup> *Id.* § 2(5).

<sup>22</sup> *Id.*

Energy Resources (“DOER”) but over the opposition of the Attorney General of Massachusetts for the delivery of Canadian hydropower falls under this reporting mandate. However, neither Massachusetts nor ISO-NE have a reporting mechanism or system to account for GHGs from HydroQuebec hydropower that is currently imported to and used in Massachusetts or what will be used in the future -- meaning these emissions omitted from the Commonwealth’s GHG emissions inventory. **According to sworn testimony in proceedings before the U.S. International Trade Commission in 2020, NECEC’s 20-year contract “roughly equates to about 17 percent of [Massachusetts] total electric demand.”<sup>23</sup> Thus, 17% of the electricity will be counted as having zero emissions when this is not the case.**

### **III. Greenhouse Gas Emissions From Hydropower**

Hydropower is often referred to as a “low-carbon” and “renewable” source of electricity.<sup>24</sup> This myth has been challenged for decades. Over the last 15 years, scientists have increasingly acknowledged the significant amounts of carbon dioxide (“CO<sub>2</sub>”) and methane that can be released by hydropower facilities.<sup>25</sup> Mounting evidence reveals elevated CO<sub>2</sub> and methane levels following the creation of a hydroelectric reservoir.<sup>26</sup> This initial uptick in GHG emissions can be attributed primarily to the decay of submerged trees and disturbed sediments after flooding.<sup>27</sup> CO<sub>2</sub> and methane emissions that result from organic matter decomposition can decline following the initial flooding, as revealed by a study on the Eastmain reservoir in

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<sup>23</sup> Transcript, U.S. International Trade Commission, Investigation No. 332-574: 68:2-18: Testimony of Patrick Woodcock, MA DOER, July 29, 2020.

<sup>24</sup> Cuihong Song et al., *Cradle-to-Grave Greenhouse Gas Emissions from Dams in the United States of America*, 90 RENEWABLE AND SUSTAINABLE ENERGY REVIEWS 5 (2018).

<sup>25</sup> Brad Hager Dec. at 3.

<sup>26</sup> Cristian Teodoru et al., *The Net Carbon Footprint of a Newly Created Boreal Hydroelectric Reservoir*, GLOBAL BIOGEOCHEMICAL CYCLES, May 2012, at 1.

<sup>27</sup> Brad Hager Dec. at 7; Andreas Maeck et al., *Sediment Trapping by Dams Creates Methane Emission Hot Spots*, ENV'T'L SCI. & TECH. 8130, 8130 (2013).

Quebec, Canada, but levels stabilize at values that are still higher than those from the surrounding landscape.<sup>28</sup> The release of GHG emissions due to biomass decomposition from flooding is the largest source of direct GHG emission for hydropower.<sup>29</sup> Sources of indirect emissions from hydropower include construction work on the facility itself, transportation of materials and workers, and waste disposal.<sup>30</sup>

GHG emissions from reservoirs are highly dynamic and can vary greatly depending on location, age, and climate.<sup>31</sup> An ideal reservoir is one sited in narrow mountain valleys above the treeline.<sup>32</sup> Since these areas have less vegetation, they do not emit as much as GHGs as the shallow, lowland areas with forests once they are flooded. Unfortunately, “many of HydroQuebec’s reservoirs flood vast tracts of low-lying woodlands, resulting in massive deforestation” and thus produce higher emission levels.<sup>33</sup> Peer-reviewed scientific literature ranks the carbon footprint of HydroQuebec amongst the dirtiest hydropower generators in the world.<sup>34</sup> One particular study revealed that GHG emissions from six of HydroQuebec’s reservoirs range from about that of a natural gas power plant to over twice that of coal-fired power plants.<sup>35</sup> Another study of a 485 MW reservoir in Northern Quebec found that net CO<sub>2</sub> equivalent emissions rate of a new hydroelectric dam in a boreal forest landscape could exceed the emissions of a new natural gas facility over the first few years of the asset’s life.<sup>36</sup>

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<sup>28</sup> Teodoru et al., *supra* note 21, at 12.

<sup>29</sup> William Steinhurst et al., *Hydropower Greenhouse Gas Emissions*, SYNAPSE ENERGY ECON. 12 (2012)

<sup>30</sup> *Id.* at 11.

<sup>31</sup> Teodoru et al., *supra* note 21, at 1.

<sup>32</sup> Brad Hager Dec. at 6–7.

<sup>33</sup> *Id.*

<sup>34</sup> *Id.* at 8.

<sup>35</sup> *See id.* at 3 (emissions from natural gas power plants are approximately 400g CO<sub>2</sub>e per kilowatt hour and approximately 1,000g CO<sub>2</sub>e per kilowatt hours from coal power plants).

<sup>36</sup> *See* Teodoru et al., *supra* note 21.

Studies suggest that hydropower production could release more GHG emissions than fossil fuel energy when taking into account the entire life cycle of the emissions.<sup>37</sup> A comprehensive understanding of life cycle GHG emissions from hydroelectric dams requires the application of a life cycle assessment (“LCA”).<sup>38</sup> An LCA is a method used to evaluate the totality of environmental impacts of a product or service from “cradle to grave.”<sup>39</sup> As part of an LCA for a hydroelectric dam, GHG emissions are calculated beginning with the construction of the facility all the way through the decommissioning phase.<sup>40</sup> Failing to account for emissions at the “end-of-life stage” could lead to an underestimation of a dam’s total GHG contribution.<sup>41</sup> It is important to factor in the impacts of decommissioning hydroelectric facilities at the end of their life cycle when considering this particular energy source and its implications for climate change.<sup>42</sup> In addition, one study concluded that newly flooded boreal reservoirs (such as HydroQuebec’s) “have life cycle emissions that likely exceed those of other renewable sources.”<sup>43</sup>

A GHG such as CO<sub>2</sub> does not remain localized once emitted.<sup>44</sup> Rather, CO<sub>2</sub> disperses evenly throughout the atmosphere and transcends the borders of any state or country.<sup>45</sup> This is known as the “spillover effect” which recognizes that the costs and benefits of GHG regulations may not be fully internalized within a state.<sup>46</sup> Addressing climate change requires the consideration of global emissions rather than just local emissions.<sup>47</sup> This is especially pertinent in

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<sup>37</sup> Song et al., *supra* note 19.

<sup>38</sup> Sergio Pacca, *Impacts From Decommissioning of Hydroelectric Dams: A Life Cycle Perspective*, 84 CLIMATIC CHANGE 281, 282 (2007).

<sup>39</sup> *Id.*

<sup>40</sup> *See id.*

<sup>41</sup> Song et al., *supra* note 19, at 14.

<sup>42</sup> *See* Pacca, *supra* note 31, at 291–92.

<sup>43</sup> William Steinhurst et al., *supra* note 26, at 20.

<sup>44</sup> Raymond B. Ludwiszewski & Charles H. Haake, *Cars, Carbon, and Climate Change*, 102 NW. U. L. REV. 665, 679 (2008).

<sup>45</sup> *Id.*

<sup>46</sup> *Id.* at 680.

<sup>47</sup> Brad Hager Dec. at 2.

the context of hydropower, an energy source that has been found to emit a global average of 173 kg of CO<sub>2</sub> and 2.95 kg of methane per megawatt hour of electricity produced.<sup>48</sup>

#### **IV. The 2030 CECP Fails to Account For Hydropower Emissions**

Hydropower emissions exceed that of all other renewable energies and are far greater than previously assumed.<sup>49</sup> The uncertainties that persist in measuring emissions from hydroelectricity generation underscores the need for more extensive monitoring and investigation. Underlying these uncertainties is the idea that hydropower is not as universally beneficial to climate needs as previously claimed.<sup>50</sup> Collecting more data on emissions and minimizing climate impacts must be a priority in the design and construction of new hydropower facilities.<sup>51</sup> A comprehensive evaluation of hydropower is vital for Massachusetts to determine the feasibility of this energy source for its emission reduction goals. However, EEA has neglected to account for emissions from hydroelectric dams in its interim 2030 CECP.

**As DOER testified, over a 20-year period 17% of Massachusetts electricity consumption will be coming from NECEC hydropower imports (assuming the transmission corridor is ever built). Massachusetts must account for the emissions from existing and future Canadian hydropower imports. Otherwise, it is playing a dangerous shell game with GHG accounting during a climate crisis – the very crisis the CECP and Roadmap purport to address.**

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<sup>48</sup> See Laura Scherer & Stephan Pfister, *Hydropower's Biogenic Carbon Footprint*, PLOS ONE, Sept. 2016, at 7 (table depicting global estimates of carbon and methane emissions from a study of ~1,500 hydropower plants).

<sup>49</sup> *Id.* at 1.

<sup>50</sup> Ilissa B. Ocko & Steven P. Hamburg, *Climate Impacts of Hydropower: Enormous Differences Among Facilities and Over Time*, ENV'T SCI. & TECH., at M (2019).

<sup>51</sup> *Id.*



The CECP and Massachusetts's GHG emission inventory are supposed to account for, at a minimum, direct GHG emissions.<sup>52</sup> Direct emissions are defined under the GWSA as “emissions from sources that are owned or operated, in whole or in part, by an entity or facility including, but not limited to, emissions from factory stacks, manufacturing processes and vents, and company owned or company-leased motor vehicles.”<sup>53</sup> This definition broadly encompasses all energy sources that are owned or operated by an entity without qualification. HydroQuebec's generating fleet comprises of 61 hydroelectric generating stations, 24 thermal plants, and 28 large reservoirs<sup>54</sup> which will be employed to supply the NECEC project, plus the Upper Churchill hydropower facility in Labrador that accounts for 1/6<sup>th</sup> of Hydro-Quebec's supply, for a total of 63 generating stations used to supply exports. Hydro-Quebec itself identified that its hydropower facilities release an estimated 17 kg of CO<sub>2</sub> emissions per megawatt hour.<sup>55</sup> Even ignoring the scientific evidence that this estimate is far too low,<sup>56</sup> Massachusetts should have at least accounted for the acknowledged emissions from Hydro-Quebec's energy generation. Just as coal-fired power plants must report the emissions from their smokestacks, Hydro-Quebec must report the direct emissions of each kilowatt imported into Massachusetts. To date, the Canadian hydropower industry, including Hydro-Quebec, has failed to substantiate claims of “low carbon” or “zero carbon” emissions from its hydroelectricity generation.

Massachusetts's GHG inventory does not include GHG reporting on a lifecycle basis.<sup>57</sup> In an internal memo from 2013, DEP officials recognized the existence of lifecycle GHG emissions from large-scale hydropower sources but stated that “taking these into account is not consistent

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<sup>52</sup> Bram Claeys & Sharon Weber, Memo Re: GHG Emissions From Large Hydro in the Context of the CECP, Mass. DEP, (April 9, 2013) [hereinafter Mass. DEP GHG Memo].

<sup>53</sup> GWSA, § 1 (2008).

<sup>54</sup> *Power Generation*, HYDROQUEBEC, <https://www.hydroquebec.com/generation/> (last visited Mar. 18, 2021).

<sup>55</sup> Brad Hager Dec. at 3.

<sup>56</sup> *Id.*

<sup>57</sup> Mass. DEP GHG Memo, *supra* note 43.

with the current scope of the CECP and GHG inventory for any fuel.”<sup>58</sup> Since lifecycle emissions are not considered for any other type of electric generation, Massachusetts officials apparently believed it to be inappropriate to consider them for hydropower. This stance is legally and scientifically wrong, and it enables EEA to ignore the GHG emissions associated with the creation, operation, and decommissioning of Hydro-Quebec facilities including the Upper Churchill generating station that produce electricity for export to Massachusetts.<sup>59</sup> If the goal of the 2030 CECP is to set Massachusetts on a path towards decarbonization, the state must take into account hydropower emissions from “cradle to grave.” Furthermore, LCA’s for hydropower typically cover a minimum time period of 100 years.<sup>60</sup> The time frame for adequately assessing GHG emissions does not align with Massachusetts’s goal to reach net zero emissions by 2050.

The 2030 CECP itself only mentions hydropower a handful of times when describing the procurement of “clean energy” to achieve the goal of Net Zero emissions in 2050.<sup>61</sup> Characterizing hydropower as “clean” is a glaring misrepresentation of the scientific evidence demonstrating that hydroelectricity production in fact emits significant amounts of CO<sub>2</sub> and methane. In particular, it disregards the apparent discrepancies between Hydro-Quebec’s allegedly minimal carbon footprint and the science showing significant emissions from its reservoirs.<sup>62</sup> Furthermore, the question of whether the NECEC project will result in the construction of new hydroelectric reservoirs in Quebec is not fully settled.<sup>63</sup> The possibility remains that HydroQuebec will need to construct new reservoirs to meet the growing demand for energy, resulting in additional flooding and elevated GHG emission levels due to organic matter

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<sup>58</sup> *Id.*

<sup>59</sup> *See Pacca, supra* note 31, at 290.

<sup>60</sup> *See, e.g.,* William Steinhurst et al., *supra* note 26, at 16.

<sup>61</sup> *See* MASS. EXEC. OFF. OF ENERGY AND ENV’T AFF., INTERIM 2030 CECP 38 (2020).

<sup>62</sup> *See* Brad Hager Dec. at 8.

<sup>63</sup> *Id.*

decomposition.<sup>64</sup> The Canadian government states that it plans to build more dams to supply electricity to the U.S. New dams are under construction on the Romaine River, the Lower Churchill Project (Muskrat Falls) was built for export, and Nalcor Energy is planning to build a third dam on the Churchill River at Gull Island for export out of the province via the Atlantic Loop. This means that Massachusetts is responsible for new dam construction in Canada-massive multi-billion dollar dams that would never be allowed to be in New England where even the smallest dam removal is the subject of millions in state spending and self-congratulation for saving river ecology.

A study requested by the U.S. Department of Energy (“DOE”) further highlights the uncertainty surrounding the GHG emission data and information for the NECEC project.<sup>65</sup> In 2019, DOE expended taxpayer dollars to contract for a review of CMP’s analysis of purported climate benefits from Canadian hydropower delivered by the NECEC transmission lines.<sup>66</sup> The scope of the review included scientific reports that reflected a broad range of assumptions for the project.<sup>67</sup> Ultimately, these reports did not allow the reviewer to make any conclusive statements on the reasonableness of the GHG emissions data.<sup>68</sup> The information provided in the studies was “not sufficient . . . to perform a detailed assessment,”<sup>69</sup> reinforcing the need for Massachusetts to adequately evaluate hydropower emissions before relying upon this energy source to meet its emission reduction targets.

## **V. Conclusion**

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<sup>64</sup> See *id.*; Teodoru et al., *supra* note 21, at 11. A recent study concluded that HydroQuebec would be unable to meet the export demand from the NECEC project, possibly necessitating the construction of new hydroelectric facilities. CANADIAN HYDROPOWER EXPORTS TO THE NORTHEAST U.S.: NEW TRANSMISSION CORRIDORS LINKED TO POTENTIAL NEW DAMS, NORTHBRIDGE ENERGY PARTNERS.

<sup>65</sup> Brad Hager Dec. at 3.

<sup>66</sup> *ICF’s Review of Central Maine Power’s Analysis of Climate Benefits Associated with the Proposed New England Clean Energy Connect (NECEC) Project*, DOE (Jan. 8, 2019).

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> *Id.*

Stated bluntly, “[h]ydropower is dirty energy, and should be regarded just like fossil fuel.”<sup>70</sup> There is documented scientific evidence that hydroelectric reservoirs emit substantial amounts of GHGs during the flooding stages of construction and throughout the entire life cycle of the facility. Multiple studies have concluded that these emission levels exceed those of traditional renewable energies and hover near those of fossil fuel plants. However, Massachusetts plans to increase reliance on imported hydroelectricity from Quebec without accounting for the related GHG emissions – even though NECEC will be supplying 17% of the state’s electricity if the CMP corridor is built. The Commonwealth completely disregards these emissions as it attempts to decarbonize the state and achieve net zero emissions by 2050. Massachusetts must consider GHG emission from hydropower as it pushes the state towards its clean energy goals and these considerations should be reflected in the 2030 CECP.

Very truly yours,

Margaret E. Sheehan, Esq.

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<sup>70</sup> Gary Wockner, *The False Promise of Hydropower*, WATERKEEPER ALLIANCE (2015)  
<https://waterkeeper.org/magazines/summer-2015-3/the-false-promise-of-hydropower/>.

**Additional resources:** <https://www.dropbox.com/sh/qoob5nh5gak3n2y/AABUMcoMEnjoxAMzs2YMUkina?dl=0>



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March 22, 2021

Comments to the Massachusetts Executive Office of Energy and Environmental Affairs  
On the Interim Clean Energy and Climate Plan for 2030

Submitted by  
The National Biodiesel Board

Thank you for this opportunity to submit comments regarding the draft Interim Clean Energy and Climate Plan for 2030. NBB also submitted oral comments during the public listening session on March 15.

The National Biodiesel Board (NBB) is the U.S. trade association representing the entire biodiesel and renewable diesel value chain, including producers, feedstock suppliers, and fuel distributors. NBB members play a key role in state and national programs aimed at reducing carbon emissions, displacing petroleum, improving public health, and protecting the environment. Made from an increasingly diverse mix of resources such as recycled cooking oil, byproduct soybean oil and rendered animal fats, biodiesel and renewable diesel are better, cleaner fuels that are available now for use in existing home heating furnaces without modification.

While we applaud the effort of the 2030 Climate Action Plan, which is predicated on the realization that significant carbon reduction efforts must begin in the near term for the state to achieve its mandated carbon reduction limits, we believe the plan ignores a key element – the use of Bioheat in existing furnaces. We support the plan’s “strategy action” that a Low Carbon Fuel Standard (LCFS) be implemented for transportation fuels no later than 2026, citing the need for low carbon liquid fuels particularly for “fleet operators or delivered goods.” The majority of these comments will focus on the thermal heating sector.

The heating oil industry in the Northeast, which serves some five million customers, is proactively working towards reducing the carbon intensity of its fuel. The so-called “Providence Resolution,” adopted in 2019 by more than 300 heating oil industry representatives, established the attainable goal of delivering 20 percent (B20) biodiesel blends by 2023, B50 by 2030 and 100 percent renewable fuel (B100) by 2050, thereby achieving 15 percent carbon reductions by 2023, 40 percent by 2030 and net-zero carbon emissions by 2050.

Massachusetts was the first state in the country to adopt a biodiesel mandate for both heating and transportation fuels through Chapter 206 of the Acts of 2008. It is now the only one of the several states that have adopted such legislation to never implement its provisions. This, despite the fact that Massachusetts is the third largest heating oil state by volume with over 800 million gallons delivered annually to more than 700,000 homes in the Commonwealth.



It is simply a myth that biodiesel keeps the fossil fuel industry going. Rather than perpetuating the use of petroleum-based heating oil, biodiesel is a renewable, carbon-reducing liquid fuel that can be immediately provided to those 700,000 customers in Massachusetts who currently use petroleum-based heating oil. Biodiesel moves the state away from petroleum, and increasing biodiesel blends allow the state to accelerate its move away from petroleum dependence and immediately begin reducing its carbon footprint, while improving the sustainability of the space heating market.

The adoption of a Bioheat mandate is a concept that has been adopted in Rhode Island, New York City and the surrounding metropolitan area (both RI and NY state are considering increasing the current mandate) and is also being considered in Maine, Vermont and Connecticut. Biodiesel (the same product as bioheat) for transportation use is currently mandated in Pennsylvania and Minnesota. Biodiesel and renewable diesel have been the largest source of carbon reductions in California's LCFS and Oregon's Clean Fuels Program. The Canadian Clean Fuel Standard will require liquid fuel (gasoline, diesel, home heating oil) suppliers to gradually reduce the carbon intensity of the fuels they produce and sell for use in Canada over time, leading to a decrease of approximately 13% (below 2016 levels) in the carbon intensity of the liquid fuels used in Canada by 2030. Biodiesel will play an important role in the Canadian CFS. *Removing the state's present moratorium on the 2008 biofuels mandate should be included as one of the plan's strategy actions.*

The 2030 plan does recommend a 20 percent reduction in the carbon intensity of liquid heating fuels through a "heating fuel emission cap." Furthermore, the administration's 2050 Decarbonization Roadmap Study suggests that biodiesel is a viable option for medium- and heavy-duty transportation, aviation and shipping since electrification of those modes of transportation provides limited options in the near-term. However, the 2030 plan refers to "biofuels" only once, and that is in the context of a proposed "Commission and Task Force on Clean Heat." While we encourage any effort to study biofuel, under the DOER's Alternative Energy Portfolio Standard incentive program, 28 million gallons of B100 "eligible" biofuel was utilized in 2020 alone. Biofuels are hardly in the same category as "renewable natural gas and hydrogen for space heating" – other fuels that the Commission is charged with studying to determine the "potential for sustainable and cost-effective market deployment." Almost three billion gallons of biodiesel and renewable diesel were consumed nationally in 2020. Biofuels have already proven their worth and viability.

Depending on the raw materials utilized to produce the fuel, biodiesel can reduce life cycle greenhouse gas emissions (cradle to grave) from 66-90%, with a weighted average across the United States of about 74%. Additionally, as highlighted in a recent "bottom up" study by Trinity Consultants (commissioned by NBB), the use of the fuel in space heating can reduce particulate emissions and the associated negative health consequences by about 85% at the census-tract level. One of the areas studied was in small portion of Boston, with the study showing that, relative to petroleum distillate, biodiesel use would reduce cancer risks and burdens in that location by up to 86%, avoid 8 premature deaths, reduce 4100 asthma attacks, and lessen work loss days by 1000, which collectively amount to \$69 million in avoided health costs each year.

And those are the potential health benefits suggested for just one location in Boston<sup>1</sup>; a similarly robust analysis covering the entire state would certainly reveal substantially greater benefits.

We believe that the value provided by the fuel is incredibly strong both from a health and environmental perspective. This is especially true when you consider the “time value of carbon” concept, i.e., a ton of carbon reduced today is more valuable in terms of its impacts on climate forcing than a ton of carbon reduced tomorrow or decades from now. The concept is similar to the one we learned in school – the theory of compounding interest. While we fully recognize and support the need for more wide-spread electrification in transportation and heating, that long-term goal should be and can be complimented with a near- and mid-term reduction in petroleum usage.

The 2030 plan calls transitioning the building sector “challenging” stating,

“the relatively long life of HVAC equipment, often 20-30 years, means that equipment installed in the 2020s may still be in service by 2050. This underscores that sales of electrified and other clean or renewable heating alternatives need to ramp up quickly to take advantage of as many of these transition points – the times during the 2020’s when businesses and homeowners will be replacing heating systems – as possible.”

The report further states, “Transitioning to a heat pump HVAC system will have varying impacts on consumer energy costs,” adding, “This consumer cost discrepancy is of particular concern regarding low-income households, where any increase in energy cost, even if temporary, has the potential to result in financial hardship.”

The transition to electricity is a laudable goal and can make sense if it is affordable, if the infrastructure is capable of handling the load, and the source of the electricity is low carbon. However, as the report concludes, reaching that level of decarbonization will take many years and lots of money. During that period, without the use of low-carbon petroleum replacements, the public will continue to be exposed to high levels of air pollution. *So, during that gradual transition, it makes sense for the state to pursue, on a parallel track, the broadest possible decarbonization of the existing heating sector, including heating households with biodiesel blends that can lower lifecycle carbon emissions by up to 80 percent and provide substantial health benefits, especially to low income and disadvantaged communities.* Bioheat can provide those benefits immediately, with little to no cost to consumers or the state since it is a “drop-in,” i.e., readily available turnkey fuel.

Finally, the interim plan calls for phasing out all incentives for fossil fuel systems “as soon as possible.” *The plan should make the distinction between “fossil fuel systems” and “liquid fuel systems.”* Future Mass Save incentive programs should not be limited to “air source and ground

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<sup>1</sup> "Draft Assessments of Health Benefits from Using Biodiesel as a Residential Heating Oil and Transportation Fuel," Trinity Consultants and American Lung Association, Jan. 2021 (due to be finalized in March 2021).

source heat pump incentives." *Rather, they should also include biofuel incentives which can advance carbon reductions from the building sector far more rapidly than electrification and with far more equity for low and moderate income customers.*

Thank you again for the opportunity to offer these lengthy, but important comments to the Interim 2030 plan. We look forward to a continuing dialogue with EOEEA and DOER regarding these important matters.

Sincerely,

*Stephen C. Dodge*

Stephen C. Dodge  
Director of State Regulatory Affairs  
National Biodiesel Board  
[sdodge@biodiesel.org](mailto:sdodge@biodiesel.org)  
(781) 361-0156





March 18, 2021

Secretary Kathleen A. Theoharides  
Executive Office of Energy & Environmental Affairs  
100 Cambridge St., Suite 900 Boston, MA 02114

Dear Secretary Theoharides:

The New England Convenience Store & Energy Marketers Association (NECSEMA) represents the convenience store and transportation fuel industries in Massachusetts, and throughout New England. NECSEMA members wholesale and/or retail most of the motor fuels sold in the Commonwealth. Our members own and operate over 3,400 convenience stores and employ over 54,000 people.

As you are most acutely aware, the 2030 Clean Energy Climate Plan was developed to identify strategies to achieve greenhouse gas (GHG) reductions across the Commonwealths to 45% below 1990 levels. With the imminent passage of SB 9, that mandatory emission reduction target for 2030 will now rise to a 50% reduction. This change is remarkable and will have a greater strategic and economic impact than what is currently contained in the 2030 CECP out for public review and comment. It is not yet known publicly how the proposed strategies within it will become changed, or whether new strategies not previously considered will need to be adopted to meet this new 50% mandatory reduction requirement.

Given this uncertainty, we respectfully request an indefinite suspension of the 2030 CECP comment period, until such time the Commonwealth can publicly present an amended document that considers and addresses this new mandatory 50% emission reduction requirement.

Thank you for your consideration of this important matter.

Respectfully submitted,

A handwritten signature in blue ink that reads "Brian P. Moran".

Brian P. Moran  
Director of Government Affairs  
[Brian@necsema.net](mailto:Brian@necsema.net) | (781) 297-9600 ext. 5

1044 Central Street, Suite 203  
Stoughton, MA 02072  
(781) 297 – 9600



March 18, 2021

Comments to Executive Office of Energy and Environmental Affairs Regarding the Interim Clean Energy and Climate Report for 2030:

Kozy Heat Fireplaces is a manufacturer of hearth appliances encompassing gas, electric, and wood fireplaces. Kozy Heat has a strong dealer network throughout Massachusetts, which consist of “mom and pop” shops. These small businesses are significant community contributors in the markets they serve across the Commonwealth. The elimination of gas in new construction will imminently put our dealers and business network related to them, such as chimney sweeps and installers, out of business.

Kozy Heat recognizes the changing landscape of the energy and fossil fuel industry where we are committed to working with government officials and regulators at all levels to increase access to more sustainable and climate centric fuel sources throughout our homes and businesses. That being said, we believe an immediate move to a Net Zero model could results in skyrocketing electric rates, an increased potential in a loss of power scenario for consumers, and potentially inhibit access to more affordable sources of fuel and power. Gas fireplaces provide an important role in supplemental household heat. We see realistic loss of power scenarios due to winter conditions such as frozen/down power lines or electricity demand outstripping supply highlighting the importance of a gas fireplace that can provide heat without electricity. The recent events in Texas highlight our supplemental heat concern greater than ever. All of the issues outlined above will disproportionality impact low-income households and small businesses.

Provided next is Kozy Heat’s comments on the Massachusetts Clean Energy and Climate Plan for 2030:

- Kozy Heat is concerned with the reports “transforming buildings sector overview”. The last sentence says: “...with longer and colder winters leading directly to more combustion of fuel, oil, propane and natural gas for space heating”. In comparison to the most recent webinar recording on the 2050 Climate Roadmap, where it was states that “heat pumps will work because the winters in MA are getting warmer”, these statements seem to contradict themselves and further highlight the uncertainty of providing single electric option for safely heating households and businesses in the Commonwealth. The optimal temperature range for a conventional air source heat pump operation is above 25 to 30 degrees Fahrenheit. We see no other mention for other sources of “other clean heating solutions” that are cost effective and practical.
- Kozy Heat is concerned with the “Getting to 45% in 2030; ~9.4 MMTCO<sub>2</sub>e Reduction” section. The escalation of reduction to this level will drive up costs of housing. Recently, the New Jersey Builders Association (NJBA) studied the impact of the state’s net zero energy plan on new single-family home construction. The total added cost – excluding electric vehicle (EV) charging - to construct a typical single-family home was more than \$83,500. These cost increases do not account for increased electricity costs as a result of grid transmission and new or upgraded

distribution infrastructure. We believe these cost projections also underestimate the current and possible future cost increases seen in raw goods for new construction.

- Kozy Heat is concerned with your B1 and B2 Strategy Actions. Immediately removing fossil fuels from newly constructed residences would effectively destroy these small, locally owned businesses. As well as raise the cost to build a typical 2,400 sq. ft., two-story, net zero energy home.
- Kozy Heat is concerned with using a phased-in approach that allows Green Communities to opt-in to a new high performance stretch energy code starting in 2022. When the Commonwealth is already in an economic recovery where it is facing high housing costs and low supply a net zero “stretch energy code” will dramatically slow housing construction, increase costs in one of the most expensive regions of the country, and jeopardize financing access to homebuyers.
- Regarding the CECP claims on population growth in Massachusetts: Massachusetts presently has a negative migration with commercial real estate vacancies in Boston being highest in the country for the first time in its history. The 2017 population statistic is irrelevant in 2021. According to the Pioneers Institute study: “Do The Wealthy Migrate Away From High-Tax States? A Comparison of Adjusted Gross Income Changes in Massachusetts and Florida” – “Over time, migration has significantly affected not only the growth of total state AGI, but also state population. Since 2000, the number of births in Massachusetts has steadily declined, while deaths have remained stable or grown. The result is that the Commonwealth is increasingly reliant on migration to continue expanding its tax base and pay for the health care and retirement benefits of a rapidly aging population. While the state’s population is still growing, migration within the United States has seen Massachusetts shedding residents every year since 2011. At one point in the middle 2000s, 50,000 more Massachusetts residents moved to other states every year than those who moved from other states to Massachusetts. “

Thank you for your consideration of our comments. We strongly encourage continued engagement by Executive Office of Energy and Environmental Affairs to mitigate these concerns. Please do not hesitate to contact me.

**Kyle Reasoner**

204 Industrial Park Road | Lakefield, MN 56150

800-253-4904

**T. Stephen Jones, MD, MPH**  
**Centers for Disease Control and Prevention, USPHS (retired)**  
**123 Black Birch Trail - Florence MA 01062**

March 21, 2021

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

*Re: Interim Clean Energy and Climate Plan (CECP) for 2030*

Dear Secretary, Theoharides,

I am a retired public health physician who worked at the Centers for Disease Control and Prevention for 26 years. I am greatly concerned about the oncoming devastation of climate chaos and change and offer the following comments on the proposed Interim Clean Energy and Climate Plan for 2030.

To meet Massachusetts' ambitious climate goals, the Commonwealth must dramatically reduce greenhouse gas emissions, increase protections for our lands and forests, and protect the health of our communities, particularly environmental justice communities that bear the brunt of toxic air pollution. The 2030 CECP falls far short of the urgent climate action that is required to get to just and equitable "net-zero" carbon emissions by 2050.

### **ELECTRICITY SECTOR STRATEGY (E-3)**

#### **Do not subsidize the false climate solutions of burning garbage and woody biomass.**

The state's decarbonization strategy falsely assumes that emissions from burning waste products, in particular wood residues, will have zero carbon emissions. Biomass power plants and garbage incinerators emit more carbon dioxide and harmful air pollutants per unit of energy than coal plants and are disproportionately sited in Environmental Justice communities. Letting trees grow, and reducing and recycling our waste, are real climate solutions. Massachusetts must remove woody biomass and garbage incineration from the Alternative Portfolio Standard (APS), the Renewable Portfolio Standard (RPS), the Clean Energy Standard, and the Clean Peak Standard by 2022 and end state subsidies for woody biomass combustion.

### **LAND SECTOR STRATEGY**

#### **Protecting forests is essential for carbon storage and meeting our net-zero goals.**

The 2030 CECP fails to provide a coherent and workable plan that will ensure forests will be able to meet the challenge required to achieve carbon neutrality by 2050. Massachusetts

should maximize carbon storage on the approximately one million acres of state-owned forest lands by immediately and permanently protecting them from commercial exploitation and putting them into a Carbon Reserve Program. The plan should also include policies to reduce or eliminate incentives for logging on private forest lands and switch to a carbon-based incentives program to promote proforestation through the use of reduced taxation (Chapter 61”C”) and enrollment in carbon credit markets that provide non-timber income to property owners. Revise Strategy L3 to promote keeping forests intact and stop promoting more consumptive uses of forests like developing a market for biomass energy and “junk wood,” production of cross laminated timber (CLT) and other “durable wood products” that degrade current carbon storage by forests and reduce future potential carbon capture capacity. The best and largest trees that will be targeted for consumptive uses are the very trees that are essential to keep in place as they rapidly increase their carbon removal and storage rates.

Thank you for considering these comments.

Sincerely yours,

*Steve Jones*

T. Stephen Jones, MD, MPH



March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St, Suite 900  
Boston, MA 02114

**RE: Draft Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides:

Thank you for the opportunity to submit comments on the draft Clean Energy and Climate Plan for 2030 (CECP). We appreciate the work of the Executive Office of Energy and Environmental Affairs (EEA) and its departments to evaluate pathways for the Commonwealth to reduce its greenhouse gas emissions over the coming decade.

Environment Massachusetts Research & Policy Center is a nonprofit organization dedicated to protecting our air, water and open spaces. We work to protect the places we love, advance the environmental values we share, and win real results for our environment.

Below, we offer general feedback on the framing of the CECP, as well comments on four of its sections, covering emissions related to transportation, buildings, electricity, and other sources.

**General comments**

**We should aim higher than “net zero by 2050”:** In April 2020, EEA established a 2050 target of “net zero emissions” under the authority granted by the Global Warming Solutions Act (GWSA). EEA subsequently established a 2030 emissions limit of 45 percent below 1990 levels. While we recognize that the CECP is designed to achieve these targets, we believe more aggressive action is needed.

To have the best shot at avoiding devastating climate change and ensuring a safe, livable planet for ourselves and our children, we should set Massachusetts on a path to achieve zero fossil fuel emissions (not just “net zero”) sooner than 2050. Rather than aiming for the global minimum of “net zero by 2050,” we should adopt more ambitious goals to set an example for other states and to account for the fact that not every state or country will reduce emissions as

quickly. Additionally, the IPCC forecasts contain a large degree of uncertainty. It is possible that even with net zero emissions globally by 2050, we could still experience more than 1.5 degrees of warming.

We should aim for a full phase-out of fossil fuels sooner than 2050, at least in the sectors where we have a good sense of how to achieve this goal and where technologies are available today to make rapid progress off of fossil fuels – including electricity, heating, and ground transportation.

**A straight-line trajectory isn't fast enough:** Massachusetts should not just meet the global target of cutting emissions by 45–50 percent by 2030. Rather, we should reduce emissions faster than the global average to take into account the high historical levels of emissions in the United States, as well as Massachusetts' role as a clean energy leader. We cannot rely on linear progress between 2020–2050 to meet our long-term goals, but must make greater reductions over the coming decade.

**Efficiency and conservation should be a priority:** The cleanest source of energy is the energy we never use in the first place. In all aspects of climate planning, the administration should prioritize strategies that reduce the amount of energy used through efficiency and conservation measures. For the transportation sector, we can reduce energy use by shifting trips from single-occupancy vehicles to public transit, walking, biking, and carpooling, and by reducing the need to travel. We can make our buildings more energy-efficient through weatherization, the installation of efficient appliances and plumbing fixtures, and the electrification of heating. We can reduce the amount of energy wasted in our electric grid by investing in generation and storage close to the places where electricity is consumed – for example, by installing solar panels on the roofs of our buildings.

**Stop investing in outdated infrastructure:** By mid-century, Massachusetts should end the use of fossil fuels for electricity, heating, and ground transportation. Any fossil fuel asset built today with an expected lifetime greater than 25–30 years, whether a pipeline, power plant, or home heating system, will therefore become a stranded asset. Rather than try to make fossil fuel systems incrementally cleaner – for example, through developing a low-carbon fuel standard – we should focus our efforts on technologies that will enable us to end fossil fuels use and achieve 100 percent clean energy.

**Carbon pricing can play an important role:** Since 2009, the Regional Greenhouse Gas Initiative has generated more than \$600 million in funding for energy efficiency and clean energy programs in Massachusetts. Extending a similar framework to the transportation sector, through the Transportation Climate Initiative, will help fund efforts to reduce carbon pollution associated with transportation. The Commonwealth should extend carbon pricing to heating fuels and other sectors that are not currently covered, and invest the income generated from carbon pricing in projects that reduce fossil fuel use and promote efficiency and clean energy.

## Transportation

**Set an ambitious timeline for electric vehicle deployment:** We were pleased to see the CECP echo California's commitment to make 100 percent of light-duty vehicle sales electric vehicles or other zero-emission vehicles (ZEVs)

by 2035. The Commonwealth should work with California and other participating states to ensure that annual ZEV targets between 2021 and 2035 are ambitious and in line with achieving the ultimate goal of 100 percent EV sales.

**Electrify our public transit systems:** While the CECP proposes that 30 percent of medium- and heavy-duty vehicle sales be ZEVs by 2030, it does not establish a timeline for electrifying the Commonwealth’s public transit systems, including the MBTA and regional transit authorities (RTAs). Our public transit agencies have an important role to play in leading the transition to a zero-carbon future and reducing harmful air pollution. All of the buses operated by the MBTA should be electric buses by 2030, and all RTA buses should be electric by 2035. The MBTA should electrify its commuter rail system by 2035. Additionally, state agencies should work with municipal governments and school committees to electrify school buses and other vehicles in public fleets.

**Prioritize transit, walking, and biking:** Electric vehicles have an important role to play in the transition away from fossil fuels, but relying on electric vehicles alone is an inefficient way to achieve our transportation sector emissions targets, leading to a significant increase in our demand for electricity. Rather than just “stabilizing” vehicle miles traveled, as proposed in the CECP, we should reduce the number of car trips and encourage more travel by walking, biking, and public transit. We can promote public transit ridership by increasing the frequency and reliability of service, making trips faster (for example, by setting aside designated bus-only lanes on key routes), modernizing our commuter rail system, and expanding transit service to new areas. We can also invest in sidewalks, protected bike lanes, and other elements of safe street design to encourage more walking and biking.

## **Buildings**

**Plan for a full phase-out of fossil fuel heating:** While the CECP proposes a laudable goal of installing electric heating in one million homes and 300–400 million square feet of commercial space by 2030, it is vague on the Commonwealth’s long-term objectives, calling for “at least 60 percent and potentially over 95 percent” of buildings to receive electric heating and efficiency upgrades by 2050. To protect public health, eliminate safety risks associated with gas infrastructure, and avoid the worst impacts of climate change, we should commit to getting all buildings off of fossil fuel heating by mid-century. Putting aside the question of whether it is desirable for 40 percent of buildings to use fossil fuel heating in 2050 and beyond, it may not be financially feasible to maintain our gas distribution infrastructure when 60 percent or more of the customer base has defected to other technologies. The longer we delay the decision to retire fossil fuel infrastructure, the greater the likelihood we will waste money on future stranded assets.

**Require new buildings to be fossil-fuel-free:** The CECP proposes to “avoid lock-in of building systems that are not 2050-compliant” but is vague on the requirements that will be established for new buildings. A “high-performance stretch energy code” could still allow for the installation of oil or gas heating systems. Any new building that is built with fossil fuel heating will require an upgrade to electric heating before 2050 in order to ensure a full transition to clean energy. It is much more sensible, therefore, to ensure that new buildings are built fossil-fuel-free. At a minimum, all new houses and small commercial buildings should be built without fossil fuel heating by 2025, and all other new buildings should use non-fossil-fuel heating by 2030.



## Energy supply

**Be more ambitious:** Our existing commitments to clean electricity are insufficient to prevent the worst impacts of climate change and protect public health. While expanding the clean energy standard may allow the Commonwealth to take credit for more carbon-free electricity generation, it does not necessarily incentivize the deployment of more renewable energy generation in Massachusetts or our neighboring states. We should ensure that a growing percentage of our electricity comes from local sources of renewable energy by increasing the Class I renewable portfolio standard to at least 50 percent by 2030.

**Go big on solar:** We should expand incentive programs to allow Massachusetts' installed solar capacity to reach at least 10 gigawatts by 2030. We should also encourage the deployment of distributed generation like rooftop solar and ensure that the benefits of solar energy are accessible to all communities.

**Go big on offshore wind:** We should expand our existing offshore wind mandates and procure at least 6 gigawatts of offshore wind energy by 2030.

## Other sources

**Reduce industrial energy use:** The industrial sector accounts for 10 percent of the energy used in Massachusetts. While emissions from industrial sector energy use have declined and some businesses have taken significant steps to make their facilities more efficient, more can be done. Services offered by Mass Save aren't always tailored to the needs of the industrial sector, and many facility owners may be unaware of the potential benefits to their business from implementing energy efficiency measures. Through improved outreach, better coordination among programs, and targeted incentives, the Commonwealth should reduce emissions from industrial energy use by at least 10-20 percent by 2030.

Thank you for considering our comments. You may contact me with any questions at [ben@environmentmassachusetts.org](mailto:ben@environmentmassachusetts.org) or 617-747-4368.

Sincerely,



Ben Hellerstein  
State Director  
Environment Massachusetts Research & Policy Center



March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street  
Boston MA, 02114

Dear Secretary Theoharides,

Thank you for the opportunity to provide comment on the Interim Clean Energy and Climate Plan for 2030.

The Massachusetts Association of Community Development Corporations (MACDC) is an association of mission driven community development organizations dedicated to working together and with others to create places of opportunity where people of diverse incomes and backgrounds access housing that is affordable, benefit from economic opportunities and fully participate in the civic life of their community. We achieve this by building and by sustaining a high performing and adaptive community development sector that is supported by private and public investment and sound public policies.

MACDC is a Founding Member of the Massachusetts Smart Growth Alliance (MSGA), a coalition of organizations working on a broad range of policy issues at the intersection of housing, transportation, and climate change. We are a signatory to the MSGA comment letter submitted on the Clean Energy and Climate Plan for 2030. As such, we fully endorse MSGA's comments, including the following:

- Without long-term investments in a robust and reliable public transit system, and changes in our land use policy to support more dense, affordable, mixed-use development near transit, pursuing decarbonization through electrification of the transportation system alone will exacerbate existing inequities.
- We urge EEA to put greater emphasis on the importance of investments in our public transit system as a pathway for decarbonization. The climate mitigating effects of producing more housing and enabling more compact, mixed-use development near transit are undermined if transit service is unreliable and people still need to travel by car. Additionally, our public transit system must be nimble enough to accommodate the evolving commuting patterns of the future.
- In addition to increasing investments in transportation and fostering more transit-oriented development, decarbonizing buildings is essential to complying with the Commonwealth's emissions targets for 2030 and 2050. Decarbonizing the building sector offers a host of co-benefits, including improving public health outcomes,

creating thousands of well-paying jobs, and addressing the Commonwealth's housing crisis by constructing energy efficient, affordable homes.

We have additional comments, based on the work that community development corporations are doing to create and preserve affordable housing that provides a safe, quality living environment for all residents of the communities they serve. This work is informed by the structural inequities that low-income communities, and communities of color, often face in securing the housing they need.

From this experience, and perspective, we offer the following additional comments:

- To facilitate the rapid and efficient decarbonization of our older housing stock- especially smaller properties- it is essential that clean energy and climate funding be leveraged with housing dollars and vice versa. It is equally essential that these dollars be delivered through a single, simple, efficient funding process that does not require homeowners, landlords, property owners, CDCs, municipalities or others to apply to multiple sources and deal with different rules, timelines and requirements. We cannot have our housing and energy agencies fighting over who pays for which expense when we need a whole building approach to decarbonization.
- Significant improvements to older housing in our Gateway Cities offer many benefits to residents in these communities, but can also generate the risk of rising rents and reduced affordability. The Commonwealth needs to develop a policy toolbox to mitigate these concerns and ensure that we have energy efficient, climate-resilient housing that remains affordable across all income levels. This will require subsidy, but also constraints on rent increases, property flipping, speculation and other real estate practices that harm vulnerable populations.

Thank you for your consideration of these comments. We look forward to partnering with the Commonwealth to implement a comprehensive decarbonization strategy. Feel free to reach out to me if you have any questions. I can be reached at 617-379-5922.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph Kriesberg". The signature is fluid and cursive, with the first name "Joseph" written in a larger, more prominent script than the last name "Kriesberg".

Joseph Kriesberg  
President & CEO

# Feedback on the Clean Energy and Climate Plan for 2030

From: Massachusetts-based Scientists

To: The Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs

We, the undersigned 105 Massachusetts-based scientists, researchers, health professionals, economists, engineers, and planners thank you for considering input on the 2030 Clean Energy and Climate Plan.

**We write today to urge you to incorporate a wider, more equitable range of policies to address emissions specifically from the transportation and electricity sectors.**

The transportation sector is responsible for the [largest share of emissions](#) in the Commonwealth.

What's more, communities of color in Massachusetts are exposed to about [a third more pollution](#) from transportation than are white communities. Thus, it is crucial to incorporate transportation policies that take health co-benefits into consideration and that center communities overburdened by pollution, such as zero-emission buses, equitable transit-oriented development, and other smart-growth strategies, in addition to the policies already listed in the plan.

While we appreciate the plan's ambitious targets to transition away from internal combustion engine vehicles, we urge you to coordinate with other state agencies and include a 2030 target to electrify public transit vehicles and add a transit strategy section to the plan. The plan should also include targets to electrify state and municipal vehicle fleets, prioritizing locations that are currently overburdened by transportation pollution.

Robust electrification also must be paired with strong, equitable clean energy policies to effectively decarbonize the grid. We are glad to see regional commitments to slashing electricity emissions, but we recommend that the Commonwealth incorporate additional concrete, equitable state-level policies to commit to, grow, and expand a clean electric grid in the near-term, especially as the state electrifies its transportation and heating sectors. For example, we support and strongly recommend bolder requirements for offshore wind, solar, energy storage, and energy efficiency standards. We also urge you to advance selection criteria for electricity transmission that favor non-wires solutions and projects that are well-sited and avoid impacts on vulnerable communities.

We need a wide range of equitable, holistic policies to tackle our most complicated sectors to avoid the risk of continuing the status quo and exacerbating systemic environmental injustices. We are counting on the leadership of Massachusetts to set a national example.

Sincerely,

Marwa Ahmed, M.D.  
Medicine/Medical Research  
Cambridge, MA

Juan Artes, Post doc  
Biochemistry  
Cambridge, MA

Ahmad Azari, M.A./M.S.  
Boston University  
Boston, MA

Dr. Gaurab Basu, M.D.  
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Brenna Boehman, Ph.D. candidate  
Organic Geochemistry  
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Fawn Boyd Vigil, M.A./M.S.  
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Mira Brown, M.A./M.S.  
Science Education  
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Melanie Brunt, M.D.  
Endocrinology and Diabetes  
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David Bryant, Post doc  
Ecosystem Modeling and Analysis  
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Ramon Bueno, M.A./M.S.  
Climate Resilience, Equity, Development  
Somerville, MA

Blake Cady, M.D.  
Surgical Oncology  
Brookline, MA

Manjula Canagaratna, Post doc  
Atmospheric chemistry  
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Mechanical Engineering  
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Samantha Clayton, Ph.D. candidate  
Biomedical Engineering  
Brighton, MA

Margery Cole, Ph.D.  
Cellular and Developmental Biology  
Pittsfield, MA

Margaret Collins, Ph.D.  
Geological Oceanography  
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Herbert Copeland, M.D.  
Pediatrics and Public Health  
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Jeanne Davis  
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Michael Delaney, Ph.D.  
Analytical Chemistry  
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Lee Dietterich, Post doc  
Plant-Soil Interactions  
Maynard, MA

Norman Douglas, Ph.D.  
Financial Economics  
Great Barrington, MA

Diana Dumit, Ph.D. candidate  
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March 22, 2021

Ms. Kathleen A. Theoharides  
Secretary of Energy and Environmental Affairs  
Massachusetts Executive Office of Energy and Environmental Affairs  
100 Cambridge St, Suite 900  
Boston, MA 02114

RE: Interim Clean Energy and Climate Plan for 2030

Tecogen, located in Waltham, Massachusetts, respectfully submits the following comments in response to the Interim Clean Energy and Climate Plan for 2030 (2030 CECP). These comments address the proposed phase-out of incentives for fossil-fuel heating systems between 2022 and 2024, and the benefits of Combined Heat and Power (CHP) systems even as the electric grid decarbonizes. We urge the Executive Office of Energy and Environmental Affairs to revisit its proposal to end incentives for CHP, and continue rewarding high efficiency, environmentally superior CHP systems.

CHP systems participating in Mass Save and the Alternative Portfolio Standard programs provide a suite of benefits to ratepayers that will still be realized up to, and potentially beyond 2050. They reduce the emission of CO<sub>2</sub> and other criteria pollutants, as well as providing on-site electric and thermal resiliency. We suggest as one resource examining the benefits that are quantified for CHP projects that have received the Mass Save incentive, and urge that the Executive Office of Energy and Environmental Affairs utilize program information on CO<sub>2</sub> reductions from CHP in their decision of whether to continue incentivizing projects. Another, albeit anecdotal, data resource are the several US EPA CHP Award winning projects based in Massachusetts that have self-certified significant CO<sub>2</sub> reductions as well as dozens of Massachusetts businesses that have made public statements on the CO<sub>2</sub> reductions from their CHP investments.

CHP provides a significant CO<sub>2</sub> savings relative to current Massachusetts grid emissions. The NE-ISO Load-Weighted Marginal Unit (LMU) marginal emission rate for 2018 was 745 lbs. CO<sub>2</sub>/kWh, and the eGRID Non-Baseload emissions rate for the NE ISO, which is used to calculate CO<sub>2</sub> savings from Mass Save projects, is 931 lbs. CO<sub>2</sub>/kWh. According to a 2019 study by ICF, *As the Grid Gets Greener, Combined Heat and Power Still Has a Role to Play*, CHP emissions are estimated at 652 lbs. CO<sub>2</sub>/kWh when accounting for offset boiler emissions. Using either 745 lbs. CO<sub>2</sub>/kWh or 931 lbs. CO<sub>2</sub>/kWh, CHP provides a significant CO<sub>2</sub> savings, and will until marginal grid emissions are drastically reduced.

This savings relative to marginal grid emissions, combined with CHP's high capacity factor, leads to significant CO<sub>2</sub> savings, even compared to the same MW of installed wind and solar. According to a study by Entropy Research, LLC. 10MW of CHP with an 85% capacity factor can provide 33,533 tons of CO<sub>2</sub> savings compared to eGRID non-baseload emissions on an annual basis. For comparison, the same study found that 10MW of solar with an average capacity factor of 26.1% saved 17,159 tons of CO<sub>2</sub> annually, and 10MW of wind with an average capacity factor of 37.4% saved 24,501 tons of CO<sub>2</sub> annually. CHP

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can provide nearly double the carbon savings of solar and a 50% increase in savings compared to wind, for the same number of MW installed.

CHP systems also provide savings in the wholesale energy and capacity markets, and by decreasing energy imported from outside Massachusetts, keeping dollars in the state economy. CHP systems can reduce transmission and distribution costs, both for reduced capital expenditure in congested areas and in reduced O&M costs, benefiting ratepayers and increasing grid reliability. Investing in CHP also provides direct and secondary economic benefits to the state economy through industry design and construction jobs, as well as service jobs. We suggest that the FULL picture of the benefits of CHP, vis-à-vis all other clean heating and cooling technologies, ought to recognize these important ratepayer and societal benefits

CHP uniquely provides a suite of benefits to ratepayers that include the following:

- Reduction in criteria pollutants,
- Reduction in CO<sub>2</sub> (greenhouse gas) emissions,
- Power and Thermal Energy **resiliency** for appropriately designed CHP systems,
- Economic multiplier benefits (importing less energy) keeping dollars in MA economy,
- Local job creation, direct industry jobs, service jobs,
- Critical infrastructure support including health-care, hospitals, research, pharmaceuticals, key supply chain products and services,
- Energy and capacity savings,
- Reduction in utility transmission and distribution (T&D) capital costs benefiting ratepayers,
- Reduction in utility T&D operating and maintenance costs benefiting ratepayers, and
- Reduction in local T&D congestion, enhancing the network reliability.

Sincerely yours,

Best regards,



Benjamin M. Locke  
CEO, Tecogen



March 22, 2021

To: Executive Office of Energy & Environmental Affairs  
From: Michael Ferrante, President, Massachusetts Energy Marketers Association  
Subject: Comments on the Interim Clean Energy & Climate Plan for 2030

The Massachusetts Energy Marketers Association (MEMA) submits the following comments on the Commonwealth's Interim Clean Energy & Climate Plan (CECP) for 2030.

### **MEMA and the Heating Oil Industry**

The Massachusetts Energy Marketers Association, established in 1955, is the state trade association representing hundreds of companies in all sectors of the heating oil industry including retail distributors of heating oil, renewable liquid biofuel/biodiesel and propane; wholesale suppliers of heating oil and renewable biodiesel with large fuel storage and distribution operations statewide; and producers of B100 – 100% liquid biodiesel.

MEMA is a member of the National Energy & Fuels Institute (NEFI), and the National Oilheat Research Alliance (NORA). MEMA also partners with the National Biodiesel Board (NBB) on many initiatives to promote and increase the use of renewable liquid biodiesel in heating oil and diesel fuel nationwide.

About 800,000 residential and commercial properties currently use heating oil for space heating and hot water production statewide. The homes using heating oil, including tens of thousands low-income residents receiving fuel assistance, benefit from the highest level of customer service from more than 400 retail home energy suppliers across the state. These companies constantly strive to improve the efficiency of their customers' heating systems through new heating oil equipment installations.

The Mass Save program equipment rebate program, that garners significant financial resources from energy efficiency charges paid by heating oil customers through their electric rates, has been and continues to be most helpful in replacing older heating oil equipment with new, higher efficiency heating oil systems that reduce carbon emissions. The HEAT loan program is also crucial to improving the efficiency of homes using heating oil systems.

## **A Commitment to Reduce Carbon Emissions**

The heating oil industry in Massachusetts is committed to being a partner in helping energy officials and policy makers mitigate the impact of climate change by working towards a goal of net-zero carbon emissions by 2050. The industry has made and continues to make great progress in reducing carbon emissions by delivering renewable liquid biodiesel or Bioheat® fuel to homes and businesses statewide and replacing older equipment with new, more efficient systems.

Bioheat® fuel is an important energy source that is currently having an immediate and widespread impact on reducing greenhouse gas emissions in Massachusetts and other key heating oil states.

Bioheat® fuel is a drop-in, turn-key fuel that is currently being delivered in Massachusetts at blends as high as 50% (B50). This renewable fuel is not exhibiting any operational issues with heating oil customers, it requires no heating system modifications and can be as economical as traditional heating oil.

In Massachusetts, the Alternative Energy Portfolio Standard program (APS) under the state's Department of Energy Resources (DOER) has been highly successful in helping to incentivize "eligible" biofuel blends in heating oil. Over a two-year period, following the implementation of the APS program in January 2018, the program has seen retail distributor participation grow from a handful of companies to 78 companies today across the Commonwealth. Compared to traditional heating oil, the APS biofuel blends delivered to tens of thousands of heating oil customers across the state have cut CO<sub>2</sub>e emissions by over one billion pounds.

## **Key Comments on the Clean Energy & Climate Plan for 2030**

From an overall perspective of the CECP, MEMA:

1. Disagrees that with the plan's endorsement of transitioning "about one million residential gas, oil, and propane furnaces and boilers" to electric heat pump systems, and maintains that the CECP's assertion that "heat pump systems, which provide both winter heating and summer cooling, are poised to provide a ready, cost-effective 2050-compliant replacement as they can provide efficient heating in cold climates even at outdoor temperatures as low as -15°F," is not accurate and is misguided policy.
2. Opposes the CECP's directive that "DOER will work to eliminate Mass Save incentives for fossil fuel equipment in new construction in 2022 and align incentives with a high-performance building code including incentives for Passive House construction."
3. Opposes the plan's directive that "DOER will work to increase electrification through Mass Save programs through air source and ground source heat pump incentives and consumer education in 2022-2024."
4. Opposes the plan's support for "high-performance stretch energy codes" which focus on "deep efficiency and electrification" without the inclusion of all clean energy sources.

5. Supports the plan’s call to “convene a Commission and Task Force on Clean Heat by May 2021.”
6. Supports the plan’s directive that “MassDEP will develop and implement by 2023 a long-term declining emissions cap on heating fuels following consultation in 2021 with the Commission and Task Force on Clean Heat regarding the cap structure and levels consistent with meeting or exceeding GWSA required emissions reduction levels.”
7. Supports the plan’s directive that “The Commission and Task Force on Clean Heat will propose, by 2023, statutory, regulatory, and financing mechanisms needed to ensure the development of reliable and affordable clean heat solutions for the Commonwealth’s buildings.”
8. Supports the CECP’s call for “Decarbonized Fuel Blending,” and our association recommends the widespread use of renewable biofuels/biodiesel in both home heating oil and transportation diesel through the reinstatement of the 2008 Massachusetts law Chapter 206 – An Act Relative to Clean Energy Biofuels. This, as the plan states, will be “Consistent with diesel fuel in the transportation sector, fuel oil blended to achieve a ~20% reduction in carbon intensity by 2030.”
9. Supports the plan’s directive outlined on page 20 of the CECP that reads, “Following the implementation of TCI-P, the Commonwealth will pursue the development and implementation of a regional Low Carbon Fuel Standard (LCFS) designed to substantially reduce the carbon intensity of transportation fuels by 2030 through a market-based crediting program that supports deployment of low carbon substitutes for petroleum-based liquid transportation fuels.”
10. Our association is puzzled by the plan’s lack of support and mention of renewable biofuels/biodiesel as a pathway for decarbonizing the heating oil market while endorsing biodiesel for transportation. The CECP states on page 20, “Most existing diesel engines can operate with a biodiesel blend up to 20% without any engine modification and, nationally, such fuels retail at or near the price of petroleum diesel.” The same is true for heating oil blended with biodiesel up to 20% and higher and this has been clearly demonstrated through the MA DOER’s Alternative Energy Portfolio Standard.

### **Expanded Comments on the Clean Energy & Climate Plan for 2030**

The cover letter to the CECP states that the plan 2030 establishes a blueprint for achieving a reduction in Greenhouse Gas emissions (GHG) emissions in Massachusetts at a 45% reduction below the 1990 level in 2030 “equitably and affordably.” For the reasons set out below, MEMA maintains the plan *does not* do so equitably and affordably.

The plan states on page 7, “Climate policies over the past 10 years have driven emissions reductions. These policies primarily have targeted emissions from electricity supply, but have also promoted end-use fuel switching, clean electricity deployment, energy efficiency and flexibility, and protection of natural lands.”

- Along with the heating oil industry’s switch to biodiesel blends, the Mass Save program has been a key element in advancing the affordable replacement of all heating equipment with more efficient, cleaner equipment.

On page 9 the plan states, “The strategies to achieve emissions reductions in the 2020s necessitate influencing millions of smaller transitions over the next 10 years.”

On page 10 the plan states, “Without thoughtful intervention, though, the ability of Massachusetts residents to participate in the transition to a low-carbon economy - such as owning an electric vehicle or retrofitting their homes to be more energy efficient - will differ according to income-level, ability to access and benefit from available resources, location in urban and rural settings, proficiency in English, and previous marginalization.”

Also, on page 10, the plan states, “The Baker-Polito Administration is committed to ensuring that the policies guiding the transition to a new low-carbon economy do not exacerbate but instead assist in closing the health and economic disparities experienced in Environmental Justice communities and communities of color. EEA’s Environmental Justice Policy further codifies the obligation of agencies under EEA’s purview to include EJ as an ‘integral consideration’ across programs; this consideration is reflected in the strategies proposed in this plan.”

- MEMA maintains that these points fail to cite and address the EJ Policy’s stated objective to provide “equal access to energy benefits.” The “thoughtful intervention” in “millions of transitions” and “integral consideration” of EJ require a more careful analysis of the pressure to force hundreds of thousands of low- and moderate-income homeowners and tenants.

On page 11 the plan states, “The key technologies needed to cost-effectively decarbonize our economy - zero-emission vehicles; non-fossil fuel heating, ventilation, and air conditioning (HVAC) equipment; clean and renewable electric generators - are largely available today. However, a range of factors limit the pace of their deployment, including replacement economics, equipment production, availability of workforce, and market demand.” “The point of replacement will almost always be the most cost-effective time for any consumer to switch from one type of equipment to another.”

- MEMA maintains the list of “key” technologies is inappropriately limited to only a few options, many of which are not cost-effective or practical, at least for the next decade, most notably electric heat pumps. Further, these “factors” are not going to be reduced by eliminating Mass Save incentives. These caveats – “largely available” and “almost always” – identify the problem with a policy to *force* a switch to electric heat pumps in all cases rather than a policy that also supports new efficient heating oil and equipment that is affordable and effective and utilizes biodiesel blends that have an immediate impact on reducing carbon emissions.

On page 12 the plan states, “Any system or piece of infrastructure that has a useful life that extends to or beyond 2050 and is being installed or replaced in the next decade either needs to align with the Commonwealth’s decarbonization pathways or will need to be replaced before the end of its useful life.”

- MEMA maintains the CECP is dictating that homeowners using heating oil must convert to electric heat pumps and to accomplish this goal, the plan calls for redirecting Mass Save funds being by these homeowners through monthly utility bills to electric heat pump incentives. This approach is patently unfair and discriminatory. Using Mass Save incentives, a new, more efficient heating oil system installed in the next decade can be a key element in the plan to reduce greenhouse gas emissions, and there certainly is no need for it to be replaced before the end of its useful life. We should continue encouraging more of these replacements now – particularly where it is the affordable option.

Also, on page 12 the plan states, “The Commonwealth can play a key role in ensuring early adoption of alternatives where technological solutions are already available and cost-effective.”

- MEMA maintains the “role of ensuring early adoption” must be limited to doing so where the option is cost-effective, *i.e.*, “affordable.” Elimination of Mass Save incentives should not be a bludgeon that assumes adoption of the favored technology – electric heat pumps - - is always the right option, particularly for the low- and moderate-income population.

And on page 12 the plan states, “EEA’s analysis of a technically feasible 2030 emissions limit indicated that a 45% emissions reduction . . . can be achieved cost effectively by targeting key decision points at the time of stock turnover. EEA’s analysis also found that pursuing emissions reductions beyond 45% in 2030 would likely require technological transformations faster than stocks are expected to turnover and before key markets can fully transform.”

- MEMA asks the following. Where is “EEA’s analysis?” How was it determined that the proposed approach of forcing a turnover from oil-fired heating equipment to heat pumps to reach 45% also will *not* result in attempting to require “technological transformations faster than stocks are expected to turnover and before key markets can fully transform?”

The plan states on page 13, “The 2050 Roadmap and the 2030 analysis based upon it confirms that heat pumps and deep building envelope efficiency retrofits are likely to be the least-cost decarbonization solution across all viable pathways for at least 60% (and potentially more than 95%) of households. However, the incremental cost of each intervention and the potential policy actions needed to facilitate those transitions are difficult to precisely calculate and attribute.”

- In looking at Table 4 on page 29 that shows the breakdown between electrification vs. building efficiency retrofits, MEMA maintains there is a wide gap between 60% and 95% of households. Where is the EJ component of our communities within this range? Doesn’t that mean forcing a switch to electric heat pumps is not equitable?

The plan states on page 14, “Thus, for purposes of designing policy strategies for the next decade, cost-effectiveness was generally evaluated in the context of packages or suites of policies, non-policy actions, and general trends rather than at the level of an individual policy.

However, in some instances, especially evaluating how an entity might be able to leverage low borrowing costs or how to insulate low- and moderate-income consumers from excessive cost burdens, EEA specifically has evaluated individual policy costs or has highlighted areas that future policy must be designed around.”

- This is precisely the point MEMA is illustrating. The elimination of Mass Save incentives for switching to more efficient, clean-burning heating oil/biodiesel equipment now is inequitable and imposes excessive burdens on low- and moderate-income consumers while denying equal access to energy benefits they already have paid for through existing electricity bill charges.

On page 15 the plan expresses “the goal of establishing and recommending policies that are most equitable, least cost, and ultimately achievable . . .”

Also, on page 15 the plan offers several “Guiding questions for EEA policy analysis.” They include: “Given the likely costs, benefits, and jobs impacts, are there equity concerns associated with this policy? Are there equity concerns regarding the utilization of this technology or approach? If so, how might they be mitigated?” The plan also asks: What costs are associated with this policy? What group(s) (i.e., industry, socioeconomic, demographic, geographic) are likely to bear these costs?”

- MEMA submits the proposals in the Interim 2030 plan *do not* meet these goals or tests. Further how are these questions addressed in the IAC Climate Justice Work Group’s memo providing “feedback and suggestions on guiding questions for policies development and consideration?”

The plan states on page 27, “Increasing building energy efficiency and electrifying end uses, especially heating, represent a significant opportunity to decrease emissions from this sector while reducing homeowner costs and increasing comfort.”

The CECP states on page 28, “Electrification of space and water heating and the deployment of building envelope efficiency improvements (additional wall and ceiling insulation, air sealing, better weatherization, new windows) are the primary drivers of emissions reductions.”

- MEMA submits the following information to refute the CECP’s false narrative surrounding electric heat pumps.

Research conducted in 2020 by Kearney Consulting’s research indicated that, “Proponents of electrification tout air-source heat pumps as a low carbon solution for the home energy sector. However, while air-source heat pumps (using an average electricity mix) release lower CO<sub>2</sub> per unit of heat delivered to the household (only 57 kg of CO<sub>2</sub>), almost all of this (56 kg) consists of abiogenic (non-renewable) emissions that in fact contribute to climate change.”



Kearney also found that “By comparison, biodiesel made from soybean oil has double the total carbon emissions, at 122 kg of CO<sub>2</sub>, but about two thirds (81 kg) of that is renewable carbon that comes from soybeans. Only 41 kg is non-renewable – 15 kg less than air-source heat pumps.”

Kearney also reported that “Another downside of heat pumps is their reliance on grid-electricity generated at peak usage times.

Current renewable electricity inputs to the grid such as wind and solar, or other low-carbon generators like nuclear, cannot provide the extra electricity required to meet peak demand because their output cannot vary quickly.”

And in a study conducted in 2019 from data collected by the Massachusetts Clean Energy Center (MA CEC) from 2014-2019, the average cost of converting a 1500 square foot home to an electric air-source heat pump system in Massachusetts was \$20,428.

The study also found that in addition to the high cost of conversion to air-source heat pumps, most installers recommend retaining a supplemental source of heat due to the heat pump system’s inability to sufficiently heat residences during the winter season. MA CEC data revealed that 92.8% of the homes that installed a heat pump retained their primary heating equipment.

And in 2020, the following information was published on the MA CEC website.

“Before incentives, a single-head ductless heat pump costs around \$5,000, including installation. Whole-home replacement systems will start at \$15,000 and can range up to \$25,000 or more, depending on the home.”

“Costs increase depending on the size of the home and the degree of ductwork modification required. Ductwork modifications can increase the project costs significantly.”

“Homes that have less than 200-amp electrical service will likely incur additional costs for upgrading the electrical service to accommodate an air-source heat pump system.”

On page 28 the CECP states, “Heat pump systems, which provide both winter heating and summer cooling, are poised to provide a ready, cost-effective 2050-compliant replacement.”

- MEMA has demonstrated through the MA CEC data that heat pump systems are not cost effective, and certainly it is doubtful they are affordable for all of the one million homes the CECP seeks to convert from heating oil to heat pumps. Also, what does “2050-compliant” mean? If that is a reference to net-zero emissions, there is no evidence now that the Commonwealth can attain that goal by creating a truly renewable electric grid in 2050.

Also, on page 28 the plan states, “Transitioning to a heat pump HVAC system will have varying impacts on consumer energy costs.

Households heating with higher cost heating fuels (like oil and propane) will likely have similar or reduced total heating costs immediately, while those currently using natural gas for heat may see marginal cost increases in the near term that in most cases can be fully offset by future operating cost savings. This consumer cost discrepancy is of particular concern regarding low-income households, where any increase in energy cost, even if temporary, has the potential to result in financial hardship.”

- MEMA maintains it is not true that households heating with oil and propane will “likely have similar or reduced total heating costs immediately.” It is true that “any increase in energy cost, even if temporary, has the potential to result in financial hardship,” particularly for low-income owners and tenants.

On page 31, the plan section is titled: “B2 Strategy - Pivot the Market for Building Envelope Retrofits and Clean Heating Systems.”

- What options are included among “clean heating systems?”

Also, on page 31 the plan states, “DOER will work to phase out incentives for fossil fuel heating systems as soon as possible, limiting fossil fuel heating system incentives in the 2022-2024 Three Year Plan, and ending all fossil fuel heating system incentives by the end of 2024.”

- MEMA maintains that ending all incentives for heating oil system upgrades now is inequitable.

Also, on page 31 the plan states, “DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in EJ communities through targeted community-based incentives and outreach programs, and increased funding for pre-weatherization barriers.”

- MEMA maintains that ending the incentives for heating oil system upgrades is contrary to “expanding access.”

On page 32 the plan expresses the “goal of ensuring that the cost of long-term GWSA compliance is included in all program cost-benefit calculations, incentives for fossil-fuel heating systems are limited during the program’s next 3-year cycle (2022-2024), and all available program resources are directed to clean heating systems no later than the end of 2024.”

- Again, what are included as “clean heating systems?” MEMA believes these must include more efficient, cleaner equipment using renewable biodiesel blended with heating oil.

Also, on page 32 the plan states, “MassCEC will also work in conjunction with Mass Save to establish and implement strategies to increase heat pump adoption, enhance realization of consumer benefits for households and communities that are underrepresented in building decarbonization (including those that are low- and moderate-income, renters, minorities, and limited English language proficiency) and develop innovative solutions that can be scaled.

- Eliminating *all* incentives for oil fired systems is *not* “enhancing realization of benefits.”

Also, on page 32 the plan states, “While the 2050 Roadmap and other similar studies have found air-source heat pumps to be the most economical clean heating solution for almost all single-family homes and other small residential buildings, the diverse building stock in Massachusetts will require a range of options. There is not a one-size-fits-all solution, and not every building in Massachusetts can currently be cost-effectively electrified.”

- This is an acknowledgement of the specific concerns that are being raised by MEMA.

Also, on page 32 the plan states, “Given the urgency and difficulty of meeting our goals in the buildings sector, by 2023 the Commonwealth will impose a long-term, declining caps on heating fuel (gas, oil, propane) emissions. In 2021, the Commonwealth will convene a special Commission on Clean Heat supported by an EEA-led, cross-secretariat, inter-agency Task Force on Clean Heat.”

- The changes in the Mass Save program and the assumptions in this Interim 2030 Plan should be modified until this Task Force has been convened and done its work.

On page 33 the plan states, “With consideration given to differences across the state, the Commission and Task Force will make a recommendation to EEA before the end of 2021 regarding the structure and levels for long-term emissions caps on heating fuels consistent with the findings of the 2050 Roadmap, the 2030 emissions limit, and this plan.

- Those “differences” must include EJ considerations, and they must be assessed *before* the incentives in the Mass Save program for upgrading of oil-fired systems are eliminated.

Also, on page 33 of the plan, among the “additional issues for consideration by the Special Commission on Clean Heat and the Task Force on Clean Heat” is “potential for sustainable and cost-effective market deployment of biofuels, renewable natural gas, and hydrogen for space heating.”

- How can deployment of renewable biodiesel blends with heating oil be enhanced if Mass Save incentives are eliminated?
- Don’t practicalities of supply chain and workforce development present real concerns for ability to deploy >100,000 residential heating system changes each year?
- What is required to change residential electrical systems to support heat pumps, and how does that affect affordability?

The plan also states on page 33 “While other sectors in this report are presented with an emissions range, representing both uncertainty and a greater level of program optionality, driving the most aggressive pace possible in the building sector represents a key element to position the Commonwealth to achieve Net Zero by 2050 given the slow pace of building equipment turnover. The holistic sector caps identified here establish the boundaries of the emissions reductions the Commonwealth must achieve without dictating how it will do so.”

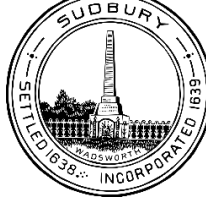
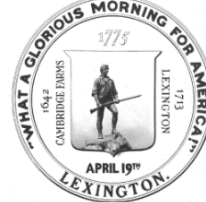
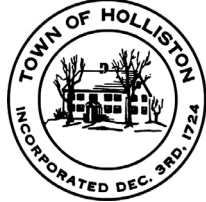
- Why can't there also be "program optionality" in the space heating sector? When paired with the carbon reduction benefits of biodiesel blends in heating, if the incentives for replacement oil-fired heating system components are increased, rather than being eliminated, we can advance reductions from this sector even more rapidly than electrification *and* with more equity for low- and moderate-income consumers.

Thank you for the opportunity to provide written comments on the CECP for 2030.

*Michael Ferrante*

Michael Ferrante, President

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March 22, 2021

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

RE: Joint Comments from Municipalities regarding the Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides,

The Cities of Framingham, Melrose and Newton and the Towns of Arlington, Ashland, Chelmsford, Concord, Holliston, Lexington, Natick, Northborough, Sherborn, Sudbury, Swampscott, Wellesley, Westborough and Weston (“Communities”) are pleased to respond to the Interim Clean Energy and Climate Plan for 2030 (“2030 CECP”).

Our Communities have grave concerns regarding the impact climate change will have on the Commonwealth, the United States, and the world, and we have each made strong commitments to reducing greenhouse gas emissions. We appreciate the thoughtful analysis the Executive Office of Energy and Environmental Affairs (EEA) has conducted to understand the complex scientific, technological and economic impact for various roadmaps.

As we work with you to advance our shared focus on climate mitigation, our Communities are struggling to answer the same question the EEA posed in the 2050 Decarbonization Roadmap Study:

***How can we achieve Net Zero while maintaining a healthy, equitable, and thriving economy?***

The release of the 2050 Decarbonization Roadmap Study and the 2030 CECP, which provides a rich and diverse collection of strategic state actions cities and towns can use to build local implementation plans, is an important first step, and we agree with the plan's overall approach to reducing emissions. Specifically, we agree with the bold actions, such as pressing BBRS to quickly implement a 2050-compliant building code, establishing 2035 as the end of sales of fossil fuel vehicles and taking actions that would change the goals and priorities of Mass Save and the Department of Public Utilities so as to align with our climate goals.

To further enhance the Commonwealth's plan, we provide the following specific requests from the viewpoint of municipalities who are endeavoring to do our part in achieving Massachusetts' climate goals and to model leading municipal actions within the state and nationally:

**1. Establish a Municipal Version of the GWSA Implementation Advisory Committee**

The Interim CEC Plan states that, "It will take action at all levels of government..." and "...continued action by local government across the Commonwealth is required." The Communities agree with this statement and encourage the Commonwealth to formally engage municipalities in the Plan's implementation. We recommend establishing a Municipal version of the GWSA Implementation Advisory Committee to provide an ongoing bridge for communications between state and local government. The Committee should be designed to reflect the diverse nature and needs of municipalities based on size, location and economic structure.

**2. Increase Funding for Municipal Climate Action**

The Communities encourage the Commonwealth to realize that, because work is needed at all levels of government, so too are new funds needed at all levels. Without this local support, which the 2030 CECP describes as "required", local actions will be delayed, sporadic or in too many cases not available at all.

Local funding should be prioritized for regional collaboration which leads to greater efficiency and uniformity among neighboring municipalities. These resources are needed at three levels. First, the Commonwealth should provide support at the community level such as funding for sustainability coordinators for program administration as well as funding for community-wide coaching to guide an equitable transition to 2050-compliant technology for all stakeholders. Second, municipalities need experts who can serve as resources in clean energy and sustainability technologies who can be available regionally to define and share best practices among cities and towns and ultimately to negotiate better deals with vendors. Third, it is crucial that municipalities are included in the improvements and expansions made to grant, rebate, and incentive programs (including renewable energy incentive programs) that will help them lead by example. Funding to facilitate, implement, maintain, and operate clean energy and electrification technologies such as EV charging station networks and clean heating equipment will be crucial to accelerating municipalities' progress to net zero.

**3. Update the Building Code with a High-Performance Stretch Energy Code**

The 2030 CECP correctly identifies the importance of moving quickly to a "new, high-performance stretch energy code requiring passive-house level building envelope efficiency." In doing so, the 2030 CECP outlines a plan to "present a new high-performance stretch energy code to the Board of Building Regulations and Standards (BBRS) in 2021 that allows for Green Communities to opt in starting in 2022 and that it will become mandatory and effective statewide no later than January 1, 2028."

The Communities – all of which have been designated as Green Communities – support the development of a new high-performance stretch energy code and the rapid, orderly transition to this code. To encourage early adoption by Green Communities, we recommend a pool of grant money be made available exclusively to Green Communities who adopt the high performance energy stretch code prior to 2028. This

would accelerate adoption of 2050-compliant technology statewide, and this incentive would provide motivation for existing Green Communities to move quickly toward the goal we share.

The Communities also seek to remind DOER how challenging it can be to adopt a new code as a general ordinance via City Council or as a bylaw through a vote of Town Meeting. Creating a mechanism for Green Communities to avoid this local legislative burden as part of the opt in process would further increase the speed of widespread code adoption. Indeed, in debating and voting to support the existing stretch energy code, Green Communities have already agreed to adopt “any future editions, amendments or modifications thereto” established through the BBRS update process. As such, the Communities ask the Commonwealth to update the 2030 CECP to clarify the process Green Communities must take to adopt the proposed high-performance stretch code, and request a provision that gives the chief municipal executive in a Green Community the authority to opt in.

The Communities welcome partnering with the DOER to further discuss these requests.

#### **4. Align Funding for Public Buildings with Net Zero Goals**

The 2030 CECP acknowledges the importance of “avoiding new infrastructure or construction that is based on fossil-fuels for heating which would not be 2050 compliant, as well as ensuring that new equipment and products within buildings are on the path towards 2050 compliance.” However, one of the largest funders of new public buildings, the Massachusetts School Building Authority (MSBA), does not currently require districts to seriously consider 2050 goals in the design and construction of new or renovated school buildings.

At present, the MSBA provides two additional reimbursement points to projects that exceed the Massachusetts Energy base code by 20%. While this is a step in the right direction, it does not go far enough. School districts across the state, including Acton-Boxborough, Arlington, Belmont, Brookline, Cambridge, Lexington, Watertown, Wellesley, and Westborough are demonstrating that fully electric, net zero ready schools – and other building types – are possible and that they do not present a significant financial burden to taxpayers. The Communities urge the EEA to require all new public buildings that are funded by the Commonwealth to be net zero ready starting in 2022 and to direct additional funding through such avenues to support the implementation of innovative clean energy and sustainability solutions in their construction.

#### **5. Prioritize Public Transit in Transportation Emission Reduction Strategies**

While the Communities applaud the plan’s focus on the “near-term, widespread electrification of the majority of the Commonwealth’s vehicles”, the absence of a clear strategy to improve and expand public transit is worrisome.

The only mention of public transit in the 2030 CECP is in relation to the Transportation and Climate Initiative Program (TCI-P), which “will also help support investments that will make it easier to get around without a car, such as improved public transportation”. This singular reference to public transit reflects an inadequate level of attention to a resource that is critical to maximizing the effectiveness of smart growth policies in our Communities and across the Commonwealth and is equally necessary in advancing equity in the transition to net zero. The Communities ask the EEA to re-evaluate the role of public transit in achieving the state’s 2030 emissions reduction goal and, at a minimum, to provide further detail on how TCI-P funding will be used to improve public transportation.

#### **6. Provide Resources to Accelerate Electrification Locally**

While municipal governments have limited expertise in emerging technologies like electric vehicles and heat pumps, we have unique insight into our communities and the concerns of local property owners who will be making decisions on the adoption of carbon-free technologies. As municipalities, we are eager to support early adopters and normalize these technologies, similar to the experience many communities have had participating in the Massachusetts Clean Energy Center’s Solarize and HeatSmart programs.

As MassCEC transitions from supporting community-level technology campaigns, we ask the state to provide municipalities with training, engineering services, technical support, web-based resources, procurement tools, implementation services and more to educate and engage with our residents and business owners about electrification opportunities.

## 7. Increase Access to Emissions Data

Local data supports local decisions, and provides feedback on progress. At present, state agencies and public utilities capture data about emissions-related activities occurring in local communities, but do not maintain or share the data in a timely manner that allows communities to assess needs, affirm actions or allow for adjustments.

The Communities ask the Commonwealth for increased access to emissions-related data that impact our cities and towns. This includes the number of electric and battery electric vehicles registered in our communities, the number of kilowatt-hours generated by solar panels located in our communities, the number of heat pumps installed in our communities, the number of properties that have participated in MassSave by Census blocks and the types of energy efficiency improvements taken, and more.

A step in the right direction is the Metropolitan Area Planning Council's (MAPC) new tool for measuring community-wide greenhouse gas emissions, which was funded by an EEA grant. This tool allows any Massachusetts community to estimate its community-wide emissions without the added cost of hiring a consultant. It is a tremendously valuable start, but even it is handicapped by stale data – most notably the 2014 Massachusetts vehicle census, which – more than five years later, remains the most recent valid vehicle census available from the state.

The Communities also believe the Massachusetts Legislature plays an essential role in conveying the voice of citizens as well as providing funding and legal mandate to the goals and path forward for the Commonwealth. There are many valuable elements of the climate legislation currently being considered in the Statehouse, and the Communities urge the Baker Administration to act quickly on this and to seek a compromise to ensure a climate bill is passed early in 2021, which will ensure the 2030 CECP has the full support of the state government.

We are proud to be part of Massachusetts's effort to achieve net zero by 2050 and look forward to collaborating with you to realize our shared goal.

Thank you for your commitment to the climate.

Sincerely,

CITY OF FRAMINGHAM



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Dr. Yvonne Spicer  
Mayor


CITY OF MELROSE



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Paul Brodeur  
Mayor

CITY OF NEWTON



---

Ruthanne Fuller  
Mayor

TOWN OF ARLINGTON



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Adam Chapdelaine  
Town Manager

TOWN OF ASHLAND



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Michael D. Herbert  
Town Manager

TOWN OF CHELMSFORD



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Paul E. Cohen  
Town Manager



TOWN OF CONCORD



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Stephen Crane  
Town Manager

TOWN OF HOLLISTON



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Travis Ahern  
Town Administrator

TOWN OF LEXINGTON



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Douglas M. Lucente  
Chair, Select Board

TOWN OF NATICK



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Jonathan Freedman  
Chair, Select Board

TOWN OF NORTHBOROUGH



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Jason Perreault  
Chair, Board of Selectmen

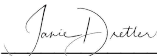
TOWN OF SHERBORN



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David R. Williams  
Town Administrator

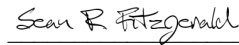
TOWN OF SUDBURY



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Janie Dretler  
Chair, Select Board

TOWN OF SWAMPSCOTT



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Sean Fitzgerald  
Town Administrator

TOWN OF WELLESLEY



---

Thomas Ulfelder  
Chair, Select Board

TOWN OF WESTBOROUGH



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Kristi Williams  
Town Manager

TOWN OF WESTON



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Leon Gaumond  
Town Manager



March 22, 2021

Kathleen A. Theoharides  
Secretary, EEA  
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Comment Letter on Interim Clean Energy and Climate Plan for 2030

Submitted by Doug Pope, President

Dear Secretary Theoharides:

We appreciate the opportunity to provide comment on the Interim Clean Energy and Climate Plan for 2030 informed by the Massachusetts 2050 Decarbonization Roadmap. We will confine our comments largely to how the 2030 CECP affects the solar industry.

Pope Energy is a larger scale solar developer that, since 2011, has been originating, developing and if required, constructing ground-mount solar, commercial rooftop solar, and more recently, agricultural solar projects on behalf of investors.

Since 1986, the Pope companies have been design-build and finance general contractors, building commercial construction projects throughout New England.

**The Strengths of the Massachusetts Solar Programs:**

Lead by the legislature, regulations established by EEA through DOER and D.P.U. have developed SREC and SMART solar programs that have grown a solar industry in Massachusetts, and in so doing, have driven down cost as products, means and methods are continually refined through experience and volume. The regulatory staff and subcontractors employed by EEA have been smart, engaged, people of good faith diligently exercising their responsibility in the best tradition of public service. Dependable departments run by EEA, taken together with the fact that EEA has not changed the program regulations within a solar program, has established Massachusetts as a dependable place to invest in solar projects and portfolios.

Building on the reputation of Massachusetts having a dependable solar program, the basic structure of the current SMART program is highly scalable and with minor adjustments could support Massachusetts solar efforts well through 2050. While the SREC I and SREC II programs could be described as a learning curve in developing a nascent industry, the SMART program should have built on that experience. Despite its potential and strength, the SMART program has fallen short due to a lack of commitment.

## **The 2030 CECP Informed by the 2050 Roadmap**

Unfortunately, after six years in office, the first sentence in Strategy E4: Continue to Deploy Solar in Massachusetts seems to capture the attitude of the Baker-Polito Administration.

“The Commonwealth’s current solar programs are anticipated to sunset after 2025, but the state and region will need to steadily continue to deploy solar generation over the next three decades to meet anticipated increased electricity demand in 2050.”

The 2030 CECP vision statement by EEA, almost boastfully, intends to end the solar program in Massachusetts with no replacement in mind. The 2050 Roadmap and 2030 CECP are loaded with both direct and indirect references that Massachusetts will do wind and the other states in “regional cooperation” will do the heavy lifting with solar development.

Politically, Governor Baker can say he developed a solar program that builds twice as much as the previous administration at half the cost. But the lack of commitment behind the solar program has cost thousands of jobs in Massachusetts.

The 2050 Roadmap and the 2030 CECP both read as if the third-party expert Cadmus, at a project kick-off meeting, was told Governor Baker loves wind, Canadian hydro and he does not like solar so, Cadmus, write your conclusions based upon those assumptions.

Almost imperceptively, the 2050 Roadmap builds a case against solar in Massachusetts.

### **2050 Roadmap - Energy Pathways, Page 11**

- High population density leading to difficult resource siting.
- Significant interties with a large-scale hydro-electric system (Hydro Quebec);
- Large offshore wind potential
- Moderate solar resource quality

### **2050 Roadmap - 2030 CECP Page 41**

“Considering the regional nature of electricity markets, overly constraining the development of ground-mounted solar in Massachusetts would likely cause this demand to simply leak across the Commonwealth’s borders.”

### **2050 Roadmap - Energy Pathways, Page 90**

“For example, this study’s results show clear patterns of resource specialization within ISO-NE - Massachusetts building offshore wind while Vermont and New Hampshire build solar, with mutually beneficial trade among them taking advantage of resource diversity.”

## 2050 Roadmap - Energy Pathways, Page 89

“Having greater regional coordination, as in the Regional Coordination pathway, reduces land requirements within Massachusetts by about 20%, though it increases land requirements elsewhere. A policy emphasis on rooftop solar development, as in the DER Breakthrough pathway, can cut the land requirement for solar in half.”

### **Regional Cooperation:**

Throughout the 2050 Roadmap and 2030 CECP, the concept of regional cooperation is emphasized in all scenarios to affect wholesale market, the management of the grid by ISO-NE, and transmission and renewable generation resource development.

As indicated above, Massachusetts is presenting itself as a state which because it is a more densely populated state, it is therefore, by definition, more difficult in which to site and develop ground mount solar.

What will other states think when they “look under the hood” of Massachusetts solar regulations and find that in 2018 a “Greenfield Subtractor” was put in place to discourage solar development specifically. In 2020, the same year as the 2050 Roadmap and 2030 CECP, EEA through DOER doubled down and increased the Greenfield Subtractor to make greenfield solar projects uneconomic and without a public hearing, specifically excluded solar development from all BioMap2, Core Habitat and Critical Natural Landscape parcels of land. The lands included are all public lands and 30,000 privately-owned parcels greater than four hectares. (9.88 acres)<sup>1</sup>

Any kind of development can take place on those parcels of private land, only solar development is specifically excluded by regulation.

The combination of the Greenfield Subtractor and the BioMap2, Core Habitat and Critical Natural Landscape excludes over 64% of land in Massachusetts which is forested.<sup>2</sup>

How would the voters and legislators of Maine, VT and NH feel about participating in “regional cooperation” if they knew that Massachusetts was keeping its lands **pristine** but could not care less about their equivalent BioMap2, Core Habitat and Critical Natural Landscape areas to accommodate new transmission lines<sup>3</sup> and 200-300 MW solar fields to benefit Massachusetts? Is this the kind of preplanned goodwill that is supposed to leak over the border?

Given that the electricity demand in each state is projected to more than double by 2050

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<sup>1</sup> Land Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 11

<sup>2</sup> Land Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 7

<sup>3</sup> Interim Climate and Clean Energy Plan, Strategy E2: Develop and Coordinate Regional Planning and Markets, December 30, 2020, Page 38

due to the “widespread electrification of the building and transportation”<sup>4</sup> sectors, each state should first focus on installing solar and other renewables within its own state before it reaches out to other states for additional renewable generation.

Is Massachusetts using its third-highest per capita income<sup>5</sup> in the United States to push around its less affluent northern neighbors? (NH 9<sup>th</sup>, VT 19<sup>th</sup> and Maine 31<sup>st</sup>) We need their goodwill to accomplish our energy security, as well as our clean energy and climate goals.

## **Sequestration, Land Use**

We acknowledge that in-state carbon sequestration is an important calculation in Governor Baker’s 85% net zero by 2050 from 1990 emissions levels.

Massachusetts has 5,019,113.6 acres of land<sup>6</sup> to which 3,702,718 consist of all-natural cover<sup>7</sup> of which 3,000,000 acres are forested<sup>8</sup> and slightly greater than 10% of that number (or 325,449 acres) represent 163 Final Core Forest areas.

The BioMap2 total of 2,029,200 acres that DOER has inserted into the regulations represents 40% of the state land mass<sup>9</sup>.

One megawatt of installed solar PV will consume 5 acres of land or less, depending upon shading, slope or obstructions. One thousand megawatts (1GW) of ground-mount solar PV would consume 5,000 acres (5-acres x 1000 MW) of land or less. In ten years, that total would be 50,000 acres or less, especially as density of watts per panel continues to increase.

At an installation rate of 1 GW<sup>10</sup> per year, it would appear that devoting 0.000996 percent of the land per year for solar development within Massachusetts, as potentially enabled in Chapter 40 Section 9B: Solar Access, to accomplish the legislated global warming emission reduction requirements would not be a burdensome intrusion of local control; particularly if larger scale solar development had a fifty-foot (50’) treed buffer protecting sight-lines of local roadways and abutting lots.

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<sup>4</sup> Interim Climate and Clean Energy Plan, Strategy E2: Develop and Coordinate Regional Planning and Markets, December 30, 2020, Page 36

<sup>5</sup> <https://www.statista.com/statistics/303555/us-per-capita-personal-income/>

<sup>6</sup> [https://www.answers.com/Q/How\\_many\\_acres\\_of\\_land\\_in\\_Massachusetts](https://www.answers.com/Q/How_many_acres_of_land_in_Massachusetts)

<sup>7</sup> BioMap2 Technical Report – Building a Better BioMap, Supplement, Mass Fish & Game, November 2011, Page84

<sup>8</sup> BioMap2 Technical Report – Building a Better BioMap, Supplement, Mass Fish & Game, November 2011.

Page 63 with Table 28 on Page 62

<sup>9</sup> BioMap2 Conserving the Biodiversity of Massachusetts in a Changing World, Mass Fish & Game 2010, Page 4 Executive Summary, Chart

<sup>10</sup> Brattle Group, Achieving 80% GHG Reduction in New England by 2050, Executive Summary, Page v, (Massachusetts has 45% of ISO-NE load, at a minimum, MA share is 1 GW per year.

One GW per year for thirty years would equal three percent of Massachusetts total land area or 158,000 acres.<sup>11</sup> This dedication of land for in-state renewable energy solar development would not be a threat to the 163 Final Core Forest Areas<sup>12</sup> totaling 325,449 acres located throughout the Commonwealth. The 163 Final Core Forest Areas are identified and could be specifically excluded from solar development by regulation.

Solar development on 158,000 acres is not a threat to the sequestration calculation, particularly since EEA does not control the privately held 30,000 lots greater than 9.88 acres which are not restricted from being developed for any other permitted use.

#### **Net vs Gross Sequestration Calculations:**

EEA should review the gross 1990 emissions levels and make public a balancing equivalent that plainly explains the calculation to 85% net zero by 2050 from 1990 emission levels. The information found may further inform the implementation of the 2050 Roadmap and 2030 CECP policy.

If Massachusetts requires large amounts of land to meet its sequestration number, rather than foist solar on other states, in the interest of “regional cooperation” the Commonwealth, through a land trust mechanism, could acquire land in other states to be held in permanent conservation under the management of the Commonwealth designee. The land could be purchased in areas where Massachusetts residents frequent for recreation or along yet-to-be built transmission corridors to be held in permanent conservation.

#### **Atlantic Flyways and Insect Pathways:**

The states in New England are on the same avian and insect flyways. We continue to lose species habitats due to anthropogenic activities. Part of the reason for the Greenfield subtractor and BioMap2, Core Habitat and Critical Natural Landscape prohibition was the effective lobbying by certain stakeholders to stop solar development particularly in the 30,000 privately held lots that EEA does not control under the auspices that birds and insects needed the forest to survive. Using this species protection argument does not carry any weight when the solar development as currently called for in the 2030 CECP and 2050 Roadmap is foisted on to another state in the same avian and insect migration pathway. See Exhibit 3.

#### **Mitigation vs. Prohibition:**

Converting 1 GW or 5,000 acres of land per year to active species habitat mitigation through solar development would be better than converting the same portion of the 30,000 lots greater than 9.88 acres that are not controlled by the state to permitted use

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<sup>11</sup> Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December, 2020, Page 88

<sup>12</sup> BioMap2 Technical Report, A Supplement to BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World, Table 28. Final Forest Core selection, after post-processing, Page 62

development. If a solar developer wants to cut trees in a wetland to remove shade from the solar array, the solar developer replants alders not only to soak up moisture but also to provide habitat for migrating bird species. As an example, solar policy would require and pay for, the planting of milkweed for monarch butterflies and low grow bushes that bloom and grow berries for bird species while providing habitat for breeding. There will be those that say, “What does this have to do with energy policy?” But the answer is climate change and species habitat loss are direct results of anthropogenic activities. If properly structured, solar development could be a partial solution to the habitat loss problem.

To give some scale as to the reality that the 30,000 private lots will be under pressure, single family residential housing is anticipated to more than double by 2050 to total 500 million square feet of building space, 323 million square feet of that to be built by 2030.<sup>13</sup>

### **2050 Roadmap and 2030 CECP Reliance on Rooftop Solar:**

#### **Building Sector Report:**

*DER Breakthrough:* This pathway explored cost reductions for distributed energy resources and resulted in high levels of rooftop solar (17 GW vs 7 GW from *All Options*), together with more behind the meter storage and flexible load, including vehicle-to-grid charging.<sup>14</sup>

The vision statement of the 2030 CECP on Page 40 states that “The Commonwealth’s current solar programs are anticipated to sunset after 2025.” If that is the case, how does EEA intend to accomplish all of the solar in the 2050 Roadmap? It has taken 10 years to install a little less than 2.5 GW.<sup>15</sup> What vision does EEA have today to accomplish the goals of the 2030 CECP?

#### **Components Unique to Rooftop Solar:**

EEA appears to place too much reliance on installing solar on 1-in-3 and 3-in-4 roofs<sup>16</sup> coupled with the useful life retirements approach taken in the 2050 Roadmap<sup>17</sup> as the preferred method of making the transition renewable investment.

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<sup>13</sup> Building Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Table 3. Projected Residential Growth by Decade in the Building Sector, Page 28

<sup>14</sup> Building Sector Report, Page 11

<sup>15</sup> Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 84

<sup>16</sup> Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 84

<sup>17</sup> Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 29

**1. The roof either needs to be less than 5 years old to have a 25-year solar system placed on the roof or be ready for replacement.**

Most commercial roofs have roofing systems that with normal maintenance will last thirty (30) years or more. A vast number of residential roofs have 30-year architectural shingles. Solar industry standards are for an 80%-84.95% production guarantee at 25-30 years with most Tier 1 solar panels.

Contractually placing a 25 to 30-year asset on anything greater than a 5-year-old roof is not a good idea and will cause solar industry reputational damage that will impede the progress of the 2050 Roadmap goals.

**2. The roof needs to be capable of carrying the load of the solar system.**

Not all roofs are solar ready as the original design was for snow and mechanical system loads only.

**3. The owner of the real estate asset needs to be willing to have solar on their roof.**

For commercial and industrial buildings, this is a big deal. Some companies have policies prohibiting solar on their roofs as a financial or operational risk management strategy.

**Actual experience:** After considerable effort, we finally achieved a meeting with the CEO of a large shopping mall complex. At a high level we estimated we could place enough solar on his roof to provide his company with \$200,000 per year in roof lease revenue for 20 years. The CEO's response: "I do not want your solar on my roof because if my tenants want that roof space, that is more valuable to me."

**Components That Need to Happen Simultaneously to Have Any Kind of Solar Installed**

**1. A solar program capable of being financed needs to be in place.**

EEA through DOER, despite well-designed and well-managed programs, has had difficulty maintaining program availability. For large rooftop solar projects that required interconnection studies, the gap was too long between SREC II and the start of the SMART program. The SMART program first started in June of 2017 and was not active until November of 2018. The SMART program was open for one week and 95% of the National Grid territory capacity was gone due to an SREC II backlog. DOER knew of that backlogged condition. Despite having a 400 MW Review provision, EEA chose to do nothing for one year to start examination of an extension to the SMART program. Revised SMART regulations were being published in April of 2020. The D.P.U. SMART tariff order for those revised SMART regulations remains outstanding and the financeable instruments, the Statements of Qualifications (SOQ), are not being processed, which means that National Grid solar



capacity has not been available from the summer of 2019 until today, March 19, 2021.

We are stunned that the 2030 CECP does nothing to inform the public, the solar industry, DOER, and D.P.U. as to how EEA is going to deliver real renewable energy results.

“Since wind and solar generation, (are) the least-cost forms of electricity supply”,<sup>18</sup> why is EEA not utilizing solar development as the fastest deliverable form of renewable energy?

Since the current SMART program is **again** is headed for uneconomic conditions, particularly in National Grid territory, EEA should start a new review of SMART that would begin in 2022 and commence a 500 MW per year build rate for all types of solar from 2023 to 2025 and rising 100 MW per year from 2026 – 2030 until 1 GW of solar is reached by 2030.

## **2. Interconnection Needs to be a Clear, Timely and an Affordable Process.**

The 2030 CECP needs to inform the interconnection and Grid Mod dockets. As written, neither the 2030 CECP or the 2050 Roadmap informs D.P.U. 19-55, D.P.U 20-75, the group study nor Grid Modernization dockets because a fixed level of solar and other DG to be interconnected per year is undefined.

Owners of commercial roofs expect action. If Owners are told it will take 6 to 9 months to receive an ISA, those owners expect delivery of that ISA. If the delay in receipt of an ISA pushes the solar project to a lower compensation block, the project will most likely be killed by these conditions. A solar developer is unable to close a contract with a commercial roof owner if the cost of interconnection and solar program compensation are not known or take too long to be determined.

The inability of Massachusetts to have both solar program and interconnection availability at the same time inhibits the achieving of 2050 Roadmap goals.

A designated annual DG interconnection and build rate will inform the interconnection and grid modernization process.

**3. Municipal Governments** and authorities having jurisdiction need to be on the same page as state agencies as solar, storage and renewable goals are rolled out. Our anecdotal experience is that municipal authorities see inconsistencies in laws and policies and expect things to continuously change.

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<sup>18</sup> Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 52

#### **4. Solar Developers, EPCs and other DG Related Business Need to Have a Framework to Actually Be in Business to Execute 2030 CECP Goals.**

Choppy solar policy implementation between solar programs combined with interconnection difficulties have caused the very kinds of companies that the 2030 CECP and 2050 Roadmap need for policy execution to leave Massachusetts or to leave the business. Choppy, poorly-defined solar policy does not promote the long-term interest of the public. An example:

When you have a company that is a Massachusetts-based, vertically-integrated design-build solar developer, that has installed over 200 MW of rooftop solar projects, that needed to lay off over 100 field personnel and 19 highly skilled staff employees and to shrink the organization to a single principal to stay in business due to delays in SMART availability and interconnection delays, that is a failure in EEA solar and DG policy implementation. How is the Commonwealth to achieve its 2030 and 2050 Roadmap goals without a declared, decade-long solar, storage and wind program?

Energy Pathways on Page 89 gives a nod to the value of “frontloading some of this solar build could be a good strategy for the state, as a way to develop the industry, develop the ability to site these resources, and reduce pressure on imports in the near term.”

Developing significant solar installed capacity in 2022 and beyond would provide the **installed, interconnected infrastructure** to be ready for the DER technology Breakthrough which will now provide the added value in 25 years to repower those installed systems and keep that land designated for renewable energy generation.

Land values in the Commonwealth will not remain static and land upon which solar and other renewable resources are located will be in economic competition with other land uses. EEA needs to keep in mind a means of keeping prior solar program projects interconnected.

#### **DER Breakthrough:**

In one sense the DER Breakthrough concept is a fact that in 20 years there will be new technology that is better than it is today. But improvements will be throughout the building, transportation, sequestration, storage and energy sectors, not just the generation sector. Undoubtedly, our expectations will rise as to what is possible and Massachusetts will legislate to achieve those possibilities.

For scale purposes, in 2011, the best commercially competitive technology was solar panels at 290 watts per panel. Today, an increasing number of solar panels are bifacial and the watts per panel is approaching 600 watts per panel. If an average improvement rate of 30 watts per panel per year continued for 20 years, the difference would be

significant, but it would not be so significant that it would change solar policy and its effect on the land. The interconnection of generation and renewable assets is the critical path. Repowering of already interconnected systems should be the focus of the 2050 Roadmap starting with implementation in the 2030 CECP.

In another sense, the DER Breakthrough as described in Figure 40 is punting the responsibility to another administration. It is an undefined catch-all of solar capacity that is currently being quietly designed to be pushed out of state. How can EEA expect to accomplish installing 900 kW to 1.3 GW per year when EEA has been unable to install 3,600 MW in 10 years? EEA needs to revise the SMART program in 2022 and educate ratepayers on the economic benefits of the transition to renewables as indicated below.

Economic and Health Impacts Report, Page 5:

“For example, the least-cost pathways (All Options, Regional Coordination, and DER Breakthrough) all experience returns in terms of economic output that are greater than three dollars per dollar spent – levels that are higher than direct investment in impacted industries because such investment reduces the need for, and total cost of, energy imports. Approximately 472,000 job-years<sup>1</sup> are created by investment in the benchmark decarbonization pathway (All Options) over the course of 30 years, translating to an average of 15,000 jobs annually. “

### **Changes to Make 2030 CECP Long-term Investments Less Costly:**

There are two components of cost that need immediate attention.

1. Long-term utility grade infrastructure needs to have its own tariff at D.P.U that reflects the 30, 40 and 46-year life of wire upgrades, substations, transmission lines, transformers and like equipment.
2. Tax-Exempt financing needs to be applied to utility upgrades to meet the 2050 Roadmap goals. The concept of a “public good” is already established an example of that is the National Grid undersea transmission cable from Nantucket to the mainland. It was financed under a specific program under the IRS code. To be widely accepted, it may take like-minded Governors to reach out to the White House and Congress to add upgrading infrastructure to deal with global warming as it will benefit all states. For example: Texas could pay for winterizing its infrastructure with tax-exempt funds.

Paying for 40-year life assets with 2% or 2.5% debt is a lot more affordable than paying for those improvements on a ten (10) year amortization schedule currently under tariff.

We have worked with Mass Development and tax counsel recommended by them, but neither party was willing to take position without greater state Executive branch engagement.



In our D.P.U. 20-75 comment letter to on December 17, 2020, we identified the fact that 36-year equipment assets under “Structure and Improvements” were aggregated with other shorter-term cost resulting in a 10.198 depreciation rate per year.

The cost to upgrade our grid system is going to be so enormous that we need to pay for short-term assets and cost on their own schedule and leave longer-term assets with a larger cost structure on their own tariff schedule.

Below is a filing by the AGO in D.P.U. 18-150 Performance-Based Ratemaking Proposal, September 30, 2019. The depreciation rate is 10.198% per year while Line 7 is 2.5% per year.

Weighted Average Depreciation Rate for General Assets, 1996						
General Assets (In Thousands of Dollars)	Value <sup>1</sup>	% of Total Value	% of Net Value	Lifetime <sup>2</sup>	Declining Balance <sup>2</sup>	Depreciation Rate
Land and Land Rights	\$489,443	1.96%		NA		
Structure and Improvements	\$7,085,330	28.35%	34.20%	36	0.89	2.5%
Office Furniture and Equipment	\$3,744,952	14.99%	18.08%	14	1.65	11.8%
Transportation Equipment	\$2,436,285	9.75%	11.76%	9	1.73	19.2%
Stores Equipment	\$182,280	0.73%	0.88%	16	1.72	10.7%
Tools, Shop and Garage Equipment	\$1,006,533	4.03%	4.86%	16	1.72	10.7%
Laboratory Equipment	\$800,097	3.20%	3.86%	12	1.62	13.5%
Power Operated Equipment	\$589,718	2.36%	2.85%	16	1.72	10.7%
Communication Equipment	\$4,871,143	19.49%	23.51%	11	1.65	15.0%
Miscellaneous Equipment	\$371,834	1.49%		NA		
Other Tangible Property	\$3,412,124	13.65%		NA		
<b>Total Value</b>	<b>\$24,989,739</b>	<b>100.00%</b>	<b>100.00%</b>	<b>20</b>		<b>10.198%</b>
Unknown Life	\$4,273,401					
Net Value	\$20,716,338					
Percent Unknown	17%					

<sup>1</sup> Source: EIA, Financial Statistics of Major Investor-Owned Electric Utilities, 1996  
<sup>2</sup> Source: Department of Commerce, "The Measurement of Depreciation in the National Income and Product Accounts", Survey of Current Business (July 1997)

We are assuming the 2050 Roadmap is using the cost structure currently in tariff which will skew their decision-making process on the need to make 40-year upgrade decisions and pay for those costs by 2030.

**2030 CECP Provides No Coordination Between Solar, Transportation and Building Utility Upgrades.**

Because the 2030 CECP excludes solar, particularly ground-mount solar, from any significant contribution, it only assigns cost to solar and does not look for the benefits solar + storage may generate to support the grid.

On a TSRG conference call, an EDC engineer mentioned that he was not concerned about transmission and distribution as they were now nearly ubiquitous, but he was

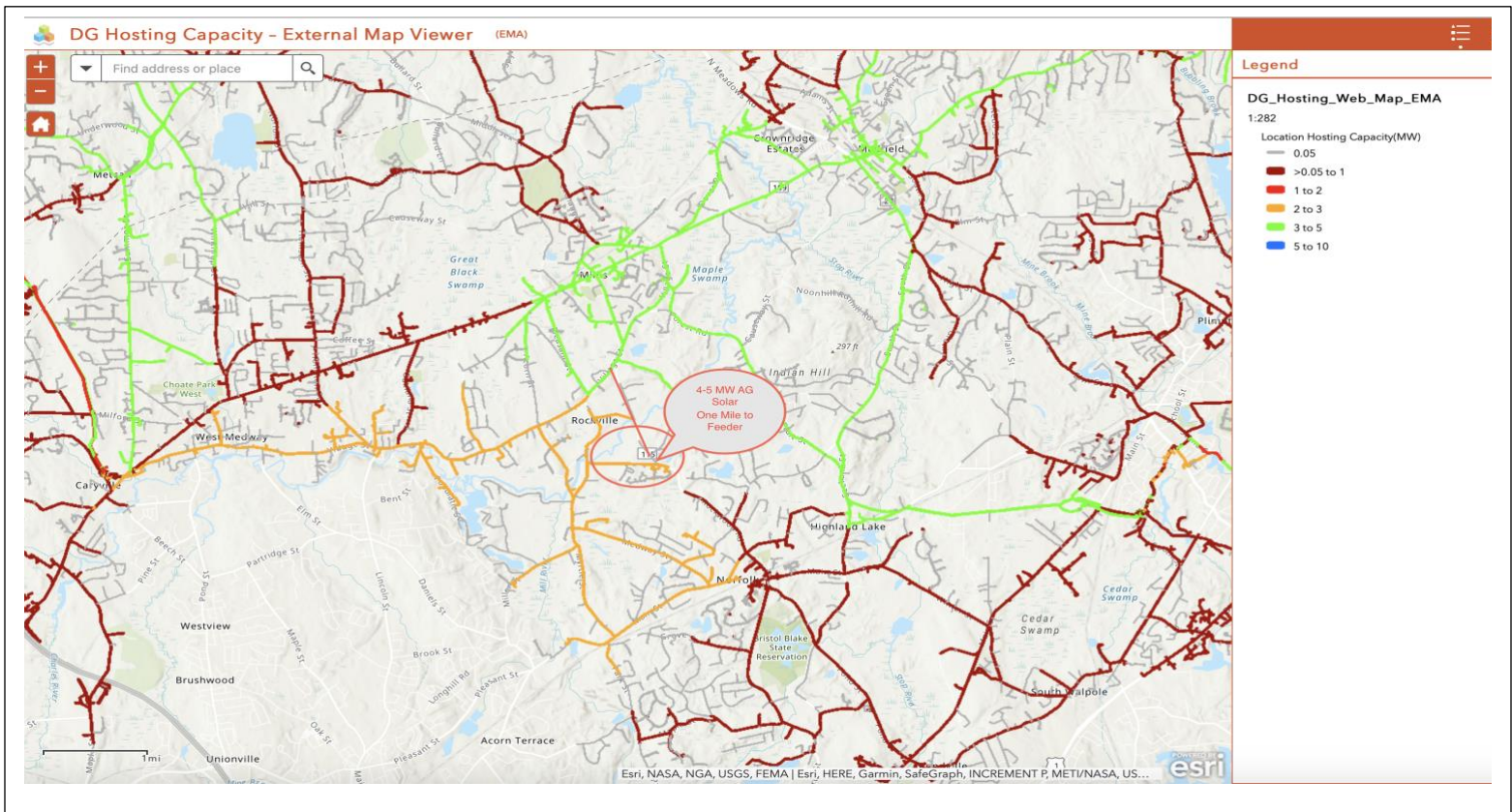
worried about VAR (Volt-amperes Reactive). Every home that has a heat pump will cause a phase shift in power generating the need for VAR or reactive power support.

Solar inverters are able to provide VAR support.

The 2050 Roadmap intends to put one million EV's on the road by 2030<sup>19</sup> and install 100,000 heat pumps or other renewable thermal in homes each year for the next 25 to 35 years<sup>20</sup>, the electrical load is scheduled to double<sup>21</sup>. The thermal load on every component on the grid will double as well, requiring the replacement of every feeder, substation and transformer. Solar will contribute to this reinvestment paradigm.

The 4-5 MW Agricultural Solar + storage project, shown below, will provide one mile of feeder upgrade and most likely contribute to substation upgrades as well, by our estimate contributing \$1,000,000 in ISA fees or \$0.20 per watt AC. Looking below at the DG Hosting Capacity Map from Eversource, would it not represent good policy to have this 4-5 MW solar + storage project provide electricity and VAR support from 4:00 - 8:00 PM to EVs and heat pumps in the homes in this Town?

If solar and wind are the least cost generation, why is solar treated with such prejudice in the 2030 CECP and 2050 Roadmap? Why is it being penalized as a first mover?



<sup>19</sup> Transportation Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Road Map Study, December 2020, 5.1.2.2 BEV Incentives, Page 30

<sup>20</sup> Building Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Sector Wide Considerations, Page 7

<sup>21</sup> Page 36

**Recommendations to the 2030 Interim Clean Energy and Climate Plan:**

1. EEA should establish a fixed build rate for solar starting in 2023-2025 at 500 MWac per year and rising 100 MW per year until 2030 whereupon 1 GW per year will remain in place until 2040. See the Brattle Group Executive Summary in Exhibit 1. This will inform:
  - a. D.P.U in its interconnection and grid modernization dockets.
  - b. DOER in its creation of a continued SMART incentive.
  - c. The utilities including their stockholders that this transition to renewables is now.
  - d. The solar industry that employment will be continuous for two decades and that investing in Massachusetts is long term.
  - e. Industry and commercial real estate that solar is not a passing fad.
  - f. Municipalities and their local planning efforts.
  - g. BBRS code regulators will now have a defined objective to achieve in the drafting and receiving stakeholder input on revised building codes.
  - h. Environmental stakeholders that mitigation is the method to protect species on the 30,000 lots larger than 10 acres.
2. EEA should instruct DOER to immediately engage in re-writing the SMART program through 2030 to be in force by January 1, 2023. Then 2040 CECP would start in 2028 so that SMART and all programs to be promulgated will be in force by January 1, 2031.
3. The SMART program would have a ten-year period ending on December 31, 2030 with no program size limits other than to restrict the installation rates other to those listed above. A project that would start development in one year and hit an annual limit would be rolled over into the next year without penalty.
4. The SMART program would have an annual review by a third-party expert engaged by DOER and rates will be administratively set to both protect the ratepayer and to encourage continued development of solar. Rhode Island has employed this method successfully. Adders for targeted sectors like rooftop, agricultural solar, community and low-income solar will remain in place. D.P.U. would need to streamline its tariff approval process to one month.
5. EEA should examine the dynamic of solar + storage systems discharging until 8:00-9:00 PM and then charging with wind power during the evening and discharging in the early morning hours. This notice to the industry will be important in design of a solar + storage system because of current ITC regulations that are in place for the first five operating years requiring solar-originated generation only.
6. Establishing firm, fixed build rates will add a framework which will shape issues such as municipal taxes in PILOT agreements, code enforcement issues on rooftops and wetland mitigation measure with local conservation commissions and DEP.

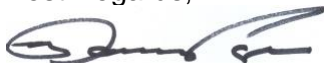
7. On the 30,000 private lots over 10 acres that EEA does not control, EEA should encourage municipalities to have a 50' treed buffer all surrounding the solar system to remove objections that solar systems are visible at street level on town roads or are affecting an abutters property. We have made this suggestion to municipalities and a sample of which is shown on Exhibit 2.
8. On the 30,000 private lots over 10 acres that EEA does not control and are subject to the development and construction of buildings that are allowed by the permitted-use zoning in the municipality where they are located, EEA should instruct DOER to develop regulations that provide active species mitigation measures as can reasonably applied. The administratively-set SMART compensation would include as a cost of solar development, the cost of installing active avian and insect mitigation measures.
9. EEA should pursue tax-exempt financing for utility infrastructure upgrades for those investments required to meet the renewable objectives of the GWSA and 2050 Roadmap.
10. EEA should instruct D.P.U. to create a tariff that aggregates long-term infrastructure investments with useful lives over 30 years together in one average rate which will be billed to ratepayer's pro rata over a 30-year or greater period.

We appreciate the tremendous amount of time EEA has put into these reports. While we are disappointed by the conclusions reached relative to the solar industry, we are encouraged by the tenor of Undersecretary Chang's remarks on the Zoom call on March 9<sup>th</sup> and the language in the Interim 2030 CECP that allows for further reflection and review.

We look forward to hopefully a more definitive and declarative plan that sets clear directions for EEA and all stakeholders.

Please reach out should you have comments or questions.

Best Regards,



Doug Pope  
President

### Exhibit 1

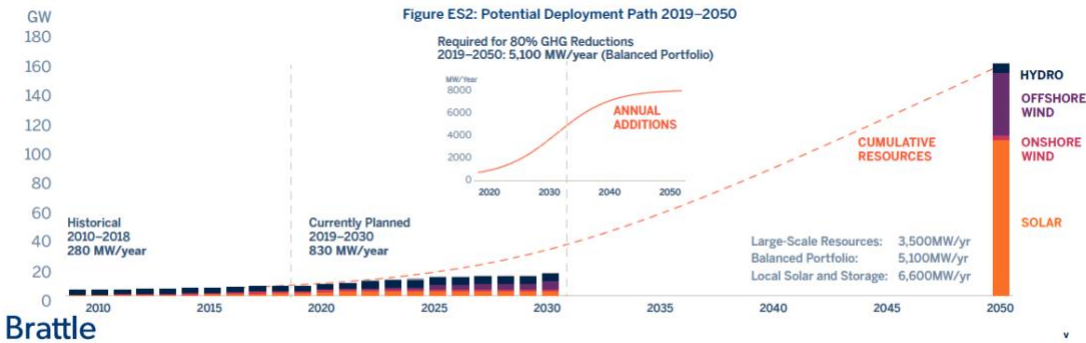
## Brattle Group, Achieving 80% GHG Reduction in New England by 2050, September 2019

#### EXECUTIVE SUMMARY

However, adding 800 MW per year through 2050 is not nearly enough. In fact, as shown in Figure ES1, between 2019 and 2050, between 3.5 GW and 6.6 GW of renewable capacity, including 2–5 GW of solar and 2–3 GW of wind, will need to be added each year on average.

Put differently, New England will need to accelerate annual deployments 4- to 8-fold compared to what is planned for the coming decade. While that sounds daunting, such ramp-ups are not unprecedented.

As a matter of fact, the acceleration New England needs is in line — if not slower — than the ramp up that wind and solar technologies have seen over the past 20 years. Over that time, annual wind installations globally have grown by over 11% per year on average, and solar PV by close to 41%. By contrast, to reach the 2050 targets in New England, annual installations of renewable projects would need to grow by about 9% per year. The ramp up does not have to happen on day one. Rather, the focus will need to be on mechanisms to keep the collective foot

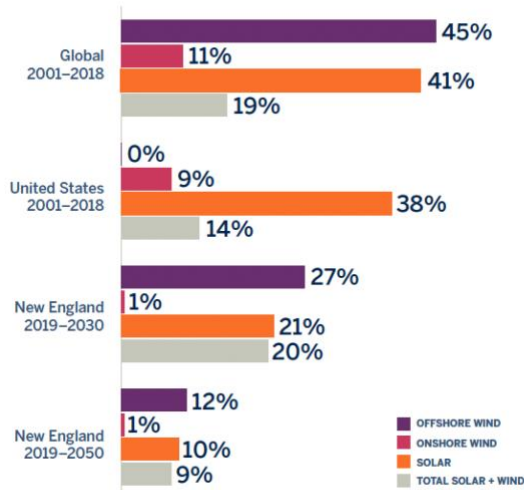


#### EXECUTIVE SUMMARY

on the clean energy accelerator until annual installations approach a level that sustains an entirely new and significant industry based on renewable energy in the future. Assuming that future growth of energy demand beyond 2050 will be modest and a typical renewable energy project will last 25–30 years, New England would need to replace about 4–5% of our facilities every year, or 7–8 GW of capacity each year, after 2050.

The bottom line is that if New England wants to make good on their greenhouse gas emissions reduction goals, they will need to keep their foot on the clean electricity development accelerator over the next critical decades to 2050. The current pace of adding more solar PV, onshore and offshore wind, battery storage, etc., is simply insufficient. However, if New England keeps growing these new industries at roughly the current rate, the region may have a chance to achieve the commitments made to decarbonize our economies by 2050 and do its part to reduce the risks of catastrophic climate change. And, in the process, it will create a substantial and sustainable new green economy.

**Figure ES3: Rate of Growth of Annual Additions**





## Exhibit 2

Sample of a local zoning change. The local planning board wanted to expand this 50' buffer concept to parcels greater than 15 acres all over town but appreciated the fact that they did not want to get too aggressive and have the zoning change fail at Town Meeting when the original intent was to approve a dual-use agricultural solar project for a family farm.

Sample:

**Proposed Amendments to Section XXI of the \_\_\_\_\_ Zoning By-Law**  
**Large-Scale Ground-Mounted Solar Photovoltaic Installations**

The following amendments (in **bold** below) are proposed to the current \_\_\_\_\_ Zoning By-Law:

1. Amend the definition of "Designated Location" in Section XXI.3 (Definitions):

***Designated Location:*** The location(s) designated herein where Large-Scale Ground-Mounted Solar Photovoltaic Installations with a Rated Nameplate Capacity of 250 kW or more may be sited As-of-Right:  
{subject to site plan review}

**(a) in the I-P and I-P-2 Districts, as shown on the Zoning Map of the Town of \_\_\_\_\_, Massachusetts referenced in Section III.C of this Zoning By-Law, or**

**(b) on any lot or grouping of contiguous lots that**

**(i) is at least 15 acres in total area and**

**(ii) consists of land**

**a. that is primarily and directly used for agricultural purposes as defined in M.G.L. c. 61A, § 1; or**

**b. that is primarily and directly used for horticultural purposes as defined in M.G.L. c. 61A, § 2; or**

**c. where at least fifty percent (50%) of the total area of the lot or grouping of contiguous lots consists of important farmlands, including without limitation prime farmlands, unique farmland, and additional farmland of statewide importance, identified by the United States Department of**

**Agriculture Natural Resources Conservation Service.**

2. Add a new subsection XXI.9(d) to Section XXI.9 (Dimension and Density Requirements):

**9. Dimension and Density Requirements:**

The following dimensional and density requirements shall apply to all LGSPI.

Setbacks:

For large-scale ground-mounted solar photovoltaic installations, front, side and rear setbacks shall be as follows:

- (a) Front yard: The front yard depth shall be at least 40 feet; provided, however, that where the lot abuts designated Conservation land or land currently used for Recreational purposes, the front yard shall not be less than 50 feet, **and where the lot abuts a Residential District, the front yard shall provide a treed fifty foot (50') wide buffer from all Town roads and residential properties, except as provided in (d) below.**
- (b) Side yard: Each side yard shall have a depth at least 20 feet; provided, however, that where the lot abuts designated Conservation land or land currently used for Recreational purposes, the side yard shall not be less than 50 feet, **and where the lot abuts a Residential District, the side yard shall provide a treed fifty foot (50') wide buffer from all Town roads and residential properties, except as provided in (d) below.**
- (c) Rear yard: The rear yard depth shall be at least 30 feet; provided, however, that where the lot abuts designated Conservation land or land currently used for Recreational purposes, the rear yard shall not be less than 50 feet, **and where the lot abuts a Residential District, the rear yard shall provide a treed fifty foot (50') wide buffer from all Town roads and residential properties, except as provided in (d) below.**
- (d) **Subject to application for and receipt of a Special Permit, natural sight barriers (which shall include without limitation rivers, upland gradients, and any wetland setbacks required by the \_\_\_\_\_ Conservation Commission pursuant to applicable law) may be considered by the Planning Board as a basis for reducing the 50' treed buffer requirement of (a), (b) and (c) above.**

3. Amend Section V. Table 1. Use Regulations, Wholesale, Transportation & Industrial, #20 and add footnote 5 to Table 1 Notes:

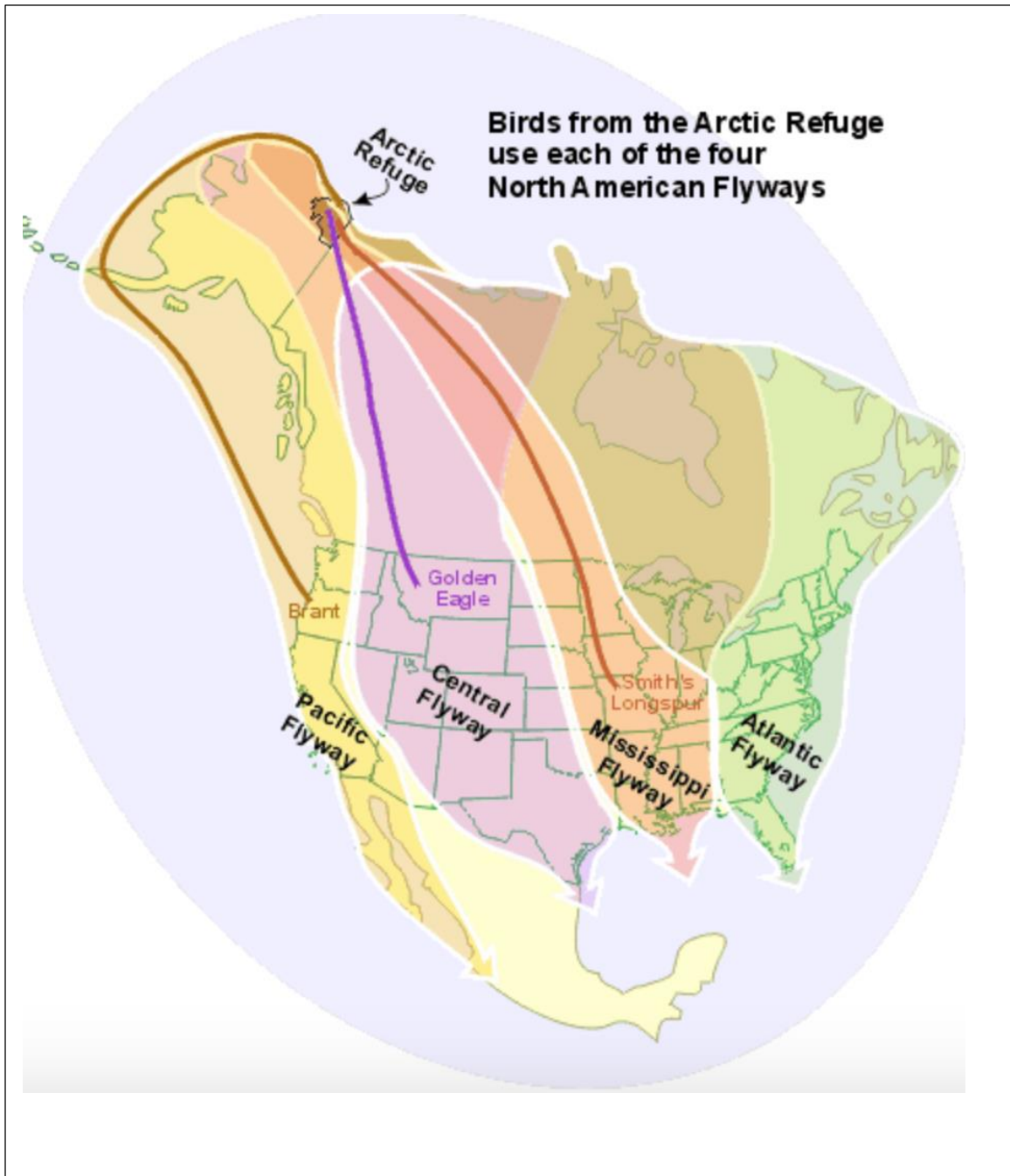
Principal Uses	R-T	R-S	R-V	R-V-C	C-V	C-V-2	V-B	I-P	I-P-2
<b>20. Large-Scale Ground-Mounted Solar Photovoltaic Installations with Rated Nameplate Capacity of 250 kW DC or more. (Added June 8, 2015)</b>	<b>N<sup>(5)</sup></b>	<b>N<sup>(5)</sup></b>	<b>N<sup>(5)</sup></b>	<b>N<sup>(5)</sup></b>	<b>N<sup>(5)</sup></b>	<b>N<sup>(5)</sup></b>	<b>N<sup>(5)</sup></b>	<b>P</b>	<b>P</b>

**Table 1 Notes: (Amended May 13, 1985) (Amended June 14, 2010)  
(Amended May 12, 2014)**

**5. But see Section XXI where, under certain conditions, such solar facilities will be allowed in the district.**

**Exhibit 3**

Atlantic Flyway – US Fish and Wildlife Service





March 22, 2021

Hon. Kathleen A. Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

**RE: Clean Energy and Climate Plan for 2030 – Transportation Sector**

Dear Secretary Theoharides:

On behalf of the Alliance for Automotive Innovation (Auto Innovators), I am writing to highlight some concerns with the *Clean Energy and Climate Plan for 2030* (2030 CECP) as currently drafted, specifically Chapter 2, entitled *Transforming our Transportation Systems*. Focused on creating a safe and transformative path for sustainable transportation, the Alliance for Automotive Innovation represents automakers producing nearly 99 percent of cars and light trucks sold in the U.S., major Tier 1 suppliers, as well as other automotive technology companies.

Auto Innovators' members are committed to the decarbonization of the transportation sector and are working diligently to expand motor vehicle offerings of plug-in electric vehicles (PEVs) and fuel cell electric vehicles (FCEVs) with ranges, price points, and vehicle types to satisfy all customers' needs. There are over 50 such vehicles available for consumers to purchase today, and 130 models promised by 2025. In fact, by the end of 2023, our members will have invested a quarter of a trillion dollars to bring such vehicles to market.

Since its inception last year, Auto Innovators' main focus has been working with policymakers to develop constructive solutions to public policy challenges that promote sustainable mobility and benefit society in the areas of environment, energy, and motor vehicle safety. It is in this light that we must commend your leadership on this issue and the time and energy put into the development of the 2030 CECP document.

With that said, we feel obligated to raise a few points where the 2030CECP could be improved. To begin with, Auto Innovators strongly objects to the treatment of hydrogen fuel cell electric vehicles within the document, which in the footnote at the bottom of page 19 specifically states "... are not considered EVs in this document." This arbitrary exclusion of FCEV is simply not justified by any scientific understanding of the technology. Second, while automakers support the decarbonization of the transportation sector, and have invested greatly to bring these technologies to market, government sales mandates do not make sustainable markets. If they did, the problem of moving ZEVs from dealer lots to consumer driveways would have been solved over 25 years ago when Massachusetts first adopted the Zero Emission Vehicle (ZEV) mandate. Instead, ZEVs comprised less than 3% of all vehicle sales in Massachusetts in 2020.

**Hydrogen Fuel Cell Electric Vehicles**

In every sense of the word, FCEVs are, in fact, EVs. While PEVs utilize electricity for propulsion that is externally generated from fossil fuels, nuclear, hydro, or solar and then stored onboard in a battery, FCEVs use an electrochemical reaction between an onboard supply of hydrogen and oxygen from the surrounding air to create electricity as needed to propel the vehicle down the roadway. Moreover, California recognizes FCEVs as an essential part of the zero emission future, not only including them in the state's ZEV mandate program (a

program that Massachusetts has opted to follow as noted in the draft document), but also providing at least \$20 million annually for hydrogen fuel station development. To choose to follow California in some areas, but then decide not to do so in others is capricious. There is simply no scientific or legal basis to justify the exclusion of this existing ZEV technology. More than simply unjustified, however, this choice is counterproductive to the Commonwealth's stated goal of decarbonizing the transportation sector on a number of fronts.

First, while consumers may fret over the combination of range limitations and lengthy recharge times associated with PEV – often forcing policymakers to require the installation of more expensive Level 2 and DC fast charging infrastructure, FCEVs provide a refueling experience very close to current consumer practices, only taking 4-5 minutes to refuel for 300-400 miles of range. This reality drastically lowers two major hurdles still working to hold back consumer acceptance of PEV. Because of the ease of refueling, FCEVs can also be dropped into commercial service much more readily, without a major interruption in business practices. Additionally, in a fleet application with daily usage in a particular geographic area, the costs of on-site hydrogen refueling infrastructure can be much more easily justified.

Second, although the draft report took the time to detail the added challenges of decarbonizing the medium duty and heavy duty sectors, by excluding FCEV from the Commonwealth's planning you remove a very important tool in that effort. One of the greatest advantages of FCEV technology is that it is scalable, where adding more fuel cell capacity to a vehicle can increase vehicle power or range. Meaning that larger vehicles do not need more complex or more expensive technology to accomplish the same tasks; they just need more of the same technology currently available in the light duty market. The scalability of the technology also means that it can be used in a much wider spectrum of vehicles, including off-road vehicles, fire engines, garbage trucks, construction equipment, port vehicles, and ferries. All of which emit dramatically more particulate matter than modern light duty vehicles and none of which have any realistic near-term battery electric alternatives.

Not only should FCEVs be included in the 2030 CECP, they should be interwoven as part of each and every project point. FCEVs should qualify for MOR-EV incentives and hydrogen fueling stations should be a dedicated segment of infrastructure planning. FCEVs are a viable ZEV technology that should be part of any decarbonization plan.

### **Mandates Do Not Make Markets**

Auto Innovators is supportive of much of the direction outlined in the draft 2030 CECP, including the participation in the Transportation Climate Initiative Program (TCI-P) and the adoption of an aggressive Low Carbon Fuel Standard (LCFS). These types of market-based mechanisms are widely understood to encourage emissions reductions in the most efficient way, especially when broadly applied. Properly structured the TCI-P and LCFS can reduce the carbon intensity (CI) of gasoline and diesel fuel either directly or by funding low CI alternatives, such as PEVs and FCEVs, and the required infrastructure required to support the use of these vehicles. It has to be noted, however, that where the 2030 CECP indicates that MassDEP will adopt and implement the California Advanced Clean Cars II Standard, which will likely call for all light duty vehicles to be ZEV by 2035, such adoption should be viewed as only the start of the Commonwealth's obligations. It has been proven time and time again that government mandates alone do not make a sustainable marketplace. As noted above, just under 3% of all light duty vehicles sold in Massachusetts were ZEV in 2020. This is far below the number of ZEV that should have been sold by this time if the state was keeping up with California's ZEV Program by supporting charging and hydrogen fueling infrastructure, and by easing regulations. As a point of comparison, California has invested approximately \$3 billion in tax dollars to support consumer adoption.

The 2030 CECP correctly highlights the need for EV charging infrastructure to be deployed to support the transition to an electrified fleet. The Commonwealth currently has 1,496 L2 and 104 DC fast charging stations,<sup>1</sup> which is not enough to support a transitioning fleet. For comparison, California has 11,559 L2 and 1,378 DC fast charging stations.<sup>2</sup> In the California Energy Commission's (CEC) recent "EV Charging Assessment Report," the CEC stated this level of charging available in California is "behind in providing the charging infrastructure needed to support the growing PEV population..."<sup>3</sup> The same report notes that California needs 1.5 million charging stations to support its goal of eight million EVs on the road by 2030. While Massachusetts is ahead of many states in EV charging infrastructure, it is still far behind what is needed. Using a simple ratio to scale Massachusetts to California suggests the Commonwealth roughly needs to expand the number of chargers from 1,496 to over 281,000 by 2030.

To be clear, the auto industry needs the electric car market to succeed, and Auto Innovators members are committed to expanding vehicle electrification. But neither mandates nor bans build successful markets. What builds successful markets is widespread stakeholder engagement: a combination of efforts by federal, state, and local governments, as well as automakers, dealers, utilities, hydrogen providers, electric charging infrastructure providers, builders, and others.

While the 2030 CECP speaks to the MOR-EV program, the size and scope of the program needs to be dramatically expanded if the state is serious about full decarbonization of the light duty sector. Additionally, a tax incentive program for public and private recharging and refueling infrastructure needs to be developed. The state will need to lead by example with respect to its own fleet, by going 100% ZEV well before the general public – as do municipalities and the state's quasi-public agencies. Building codes will need to be updated and existing housing retrofitted for an EV future. Adopting a mandate alone, regardless of how well intentioned, will not lead to the necessary shift in consumer behaviors.

Thank you for your consideration of the Auto Innovators' position. Please do not hesitate to contact me, should I be able to provide any additional information.

Sincerely,



Wayne Weikel  
Senior Director, State Affairs

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<sup>1</sup> U.S. Department of Energy Alternative Fuel Data Center. [https://afdc.energy.gov/stations/#/analyze?region=US-MA&country=US&fuel=ELEC&ev\\_levels=dc\\_fast](https://afdc.energy.gov/stations/#/analyze?region=US-MA&country=US&fuel=ELEC&ev_levels=dc_fast) (retrieved on March 19, 2021).

<sup>2</sup> Id.

<sup>3</sup> California Energy Commission. "Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment – Analyzing Charging Needs to Support Zero-Emission Vehicles in 2030." *Staff Report*, Jan. 2021. Found at: <https://www.energy.ca.gov/programs-and-topics/programs/electric-vehicle-charging-infrastructure-assessment-ab-2127>.

March 22, 2021

**BY ELECTRONIC SUBMISSION**

Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

**RE: Public Comments on the Interim Clean Energy and Climate Plan for 2030**

Vicinity Energy Inc. (“Vicinity”) is pleased to provide comments on the Interim Clean Energy and Climate Plan for 2030 (“2030 CECP”) released in December 2020. We congratulate Secretary Theoharides and the staff at the Executive Office of Energy and Environmental Affairs (“EEA”) for their commitment to achieve an economy-wide reduction in Massachusetts of greenhouse gas emissions of at least 45% below the 1990 level, one of the most ambitious emission reduction plans in the United States.

The 2030 CECP and the EEA’s 2050 Decarbonization Roadmap focus on actions needed to achieve “net-zero” carbon emissions by 2050 through a rapid transition to the use of carbon-free and resilient energy resources. Vicinity looks forward to working with the Administration to achieve these ambitious emission reduction targets. Last fall, we released our own 2050 Net Zero Carbon Roadmap, and, with this plan in place, we know we can make unique and vital contributions to the Commonwealth’s goal.

Vicinity operates a vast district energy network that supplies thermal energy to over two hundred and thirty buildings and more than 65 million square feet of space in Boston and Cambridge. This thermal energy heats buildings, heats and chills water supply, cools spaces during summer months by way of steam-driven air conditioning and enables advanced production technologies that rely on processes such as sterilization and humidification. Vicinity serves many of the most critical customers in Boston and Cambridge, including all the major downtown hospitals. Ongoing reliability of supply to these customers is of the utmost importance as we transition to a decarbonized future.

Currently, Vicinity operates a combined heat and power (CHP) unit (“Kendall”) in Cambridge, which generates electricity delivered to the grid as well as cogenerated thermal energy. Producing thermal energy from a central plant eliminates the need for installation and management of less efficient boilers on-site (thereby increasing emissions), increases the reliability of energy supply and eliminates the dangers of on-site fuel combustion. **As part of Vicinity’s 2050 Net Zero Carbon Roadmap, we will focus on greening our operations and migrating away from carbon emitting fuels. These efforts will have a dramatic impact on the carbon footprint of the 65 million square feet of space we serve today as well as the future buildings we connect to our system.**

Section 3.01 (Sector Overview) of the 2030 CECP rightly notes that emissions from the operation of Massachusetts buildings equal approximately 27% of the Commonwealth’s total greenhouse gas emissions. This is a direct result of the fact that the building sector relies heavily on on-site combustion



of fossil fuels for space and water heating. Across much of the Commonwealth, building efficiencies and the electrification of heating can be relied on to decrease emissions.

However, in urban areas, dense construction and the long lives of commercial buildings will make it nearly impossible to electrify without significant retrofit costs. In these areas, production of thermal energy with progressively lower carbon content at a central plant and supplying it to end use customers through an extensive district energy distribution network will remain the most efficient and cost-effective way to condition these buildings without compromising reliability. With that reality in mind, this section of the CECP should identify district energy distribution (i.e. steam, hot water, chilled water, etc.) as a valuable tool that will be relied on by the Commonwealth to achieve its 2030 emission reduction goal.

At the end of Section 3.2, we recommend including the following paragraph:

**As an alternative to or in conjunction with heat pumps, building owners should evaluate connecting to the district energy system where available, leveraging thermal energy delivered in the form of steam, hot water or chilled water. This thermal energy heats and cools buildings by transferring energy from the district energy network to/from the buildings heating and air conditioning systems. It also enables advanced production technologies for clinical and life sciences manufacturing and research that rely on processes such as sterilization and humidification. Connecting to this system could prove to be more efficient, more reliable due to system redundancies, and cost effective depending upon the building, location and existing infrastructure. During cold periods when heat pumps require auxiliary heating to meet building requirements, district heating could provide needed “lift” to meet critical high temperature processes that cannot be served by heat pumps alone.**

In addition, Vicinity recommends that the following sentences be added in the *Strategies and Policies* section the end of the Strategy B2 description.

**In densely developed urban areas, where building-by-building electrification may prove to be difficult and expensive, customers who are currently receiving steam through the district energy system should be encouraged to continue doing so. Customers in urban areas who are unable to electrify their heating uses should be incentivized to obtain their thermal energy needs by connecting to a district energy system that can leverage low carbon and renewable energy sources whenever feasible.**

Finally, Vicinity recommends that the following sentences be added to the report in Section 3.2 after the opening line of the 2<sup>nd</sup> paragraph, following the words “stock-turnover points.”

**Energy sourced through electrification, renewable natural gas, other biogenic fuels, hydrogen blends, etc. can be used to achieve carbon emission reductions with minimal infrastructure changes to facilities currently using pipeline gas. Use of energy sourced from these alternative fuels by facility owners should be incentivized.**

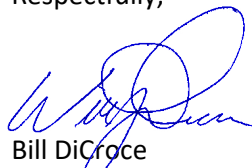
In Section 3.2 (Getting to 45% in 2030) the 2030 CECP report proposes, in Strategy B3, the establishment of a Commission and Task Force on Clean Heat to address statutory, regulatory and financing mechanisms needed to develop reliable and affordable clean heat solutions in the Commonwealth's buildings by 2023. While the role of the Commission and Task Force, in consultation with the Massachusetts Department of Environmental Protection, is to design and recommend long-term emission caps on heating fuels, it will be imperative for this Commission to also identify sustainable and cost-efficient ways to replace natural gas and oil with clean alternatives to adequately and reliably heat buildings across the Commonwealth. As experts in the field, Vicinity would like to be an active participant on this Task Force.

In addition, the 2030 CECP requires the establishment of a new "stretch energy code" in MA to be developed in 2021 and implemented by cities in 2022-2028. Vicinity also would like to be involved in the development of the stretch energy code.

Vicinity is dedicated to a [Clean Energy Future](#). With decades of experience tackling global energy problems on a local level, using local resources, Vicinity is committed to ensuring more efficient, reliable and resilient generation of thermal energy for consumers across the Commonwealth, especially in its urban centers. We appreciate that the report acknowledges the role natural gas, when used most efficiently, must serve as a crucial resource to ensure the reliability of electricity supply through 2030 and beyond. We urge the Commonwealth and EEA to recognize the contribution that CHP and district-wide steam distribution infrastructure can make to achieving its 2030 emission reduction goals and to be explicit in identifying it as a tool to be used in that process.

Thank you again for the opportunity to provide comments on the 2030 CECP. We welcome the opportunity to discuss these comments with the Secretary and staff.

Respectfully,



Bill DiCroce  
President and Chief Executive Officer

**Vicinity Energy Inc.**

[vicinityenergy.us](http://vicinityenergy.us)

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
[gwsa@mass.gov](mailto:gwsa@mass.gov)

Subject: Grassroots Organization's Comments on the 2030 Clean Energy and Climate Plan

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

We write on behalf of grassroots organizations to thank the Executive Office of Energy and Environmental Affairs (EEA) for its hard work on the Roadmap Report and 2030 Interim Clean Energy and Climate Plan ("interim CECP"). In this letter, we offer the following recommendations to make more explicit concepts of equity and justice into the final plan ("2030 CECP"). EEA has the opportunity and responsibility to integrate more precise language into the 2030 CECP that provides details about actions that will advance climate justice and energy equity.

Climate justice focuses on the root causes of climate change — human-made greenhouse gas emissions ("GHG") and related pollution — and making systemic changes that will transform unequal burdens in our energy system and communities and realign our energy systems and economy with equitable outcomes. Unless justice, equity, and worker rights are central components of our equitable climate agenda in the 2030 CECP, the inequality of the carbon-based economy will be replicated in the new pollution-free economy. Below are specific recommendations.

#### Emissions Target for 2030

We support a 50% 2030 emission target that will maximize the Commonwealth's ability to achieve net zero emissions by 2050. The state's GHG reduction limits must be informed by the best available science. This means being able to meet the IPCC's 2030 global target of cutting emissions 45-50% by 2030 and also reaching this target faster than that global average to take into account our high "historical contributions to emissions." The CECP tables demonstrate that the state can get to an emissions reduction by 2030 of 45-48 percent, which is only 2 percent away from 50 percent.<sup>1</sup> Massachusetts is required to include goals in the 2030 CECP that "maximize the ability of the [C]ommonwealth to meet the 2050 emissions limit."<sup>2</sup> The Commonwealth could meet the additional 2 percent through a variety of measures, many of which are outlined in the following sections.

Additionally, Section 10 of *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* ("Roadmap Bill") would increase the 2030 emissions target to a 50% GHG reduction. We recommend that the final 2030 CECP incorporate any changes to the 2030 emissions limit based on the outcome of the Roadmap Bill and include EEA's determination of the costs of achieving that

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<sup>1</sup> "Range of GHG reductions estimated for the full and timely implementation of strategies and policy actions outlined in the 2030 CECP," Table 1, page 13.

<sup>2</sup> M.G.L. c. 21N, § 3(b).

target, accounting for the full benefits of improved public health, quality jobs, strong economy, and benefits for environmental justice (“EJ”) populations.

### Transportation

1. **Add A Specific Strategy to Address Public Transit.** The 2030 CECP has six strategies to reduce transportation sector emissions, yet none of them is focused on investments in public transportation. We urge EEA to include a seventh transportation strategy that calls attention to investments in our public transit systems so that various reports and decisions from the Baker Administration are in lockstep with one another. Investing in public transportation has many co-benefits for public health beyond reducing congestion and reducing single occupancy vehicle trips. See below for specific recommendations on addressing this omission.
  - a. We further recommend adding a climate justice component to the public transit strategy. To promote more equity in the transit systems and increase access to public transit for environmental justice (“EJ”) populations, the Massachusetts Bay Transportation Authority (“MBTA”) and Regional Transit Authorities (“RTAs”) should adopt low-income fares or consider free fares. Access to transit is a lifeline to many who have no other means of transportation to reach destinations, such as jobs, schools, grocery stores and healthcare facilities, safely and reliably.
2. **Reduce not stabilize vehicle miles travelled (VMT) through 2030.** Transportation is our second largest sector of carbon emissions. EEA must invest and expand public transit systems, and expand funding for producing affordable mixed use developments near transit nodes. The key is to shift people away from private cars to public transit options and active modes of transportation. Active transportation and micro-mobility options across the state in combination with policies like transit oriented development and multi-family zoning to work together to reduce vehicle miles traveled (VMT).
3. **Create Advanced Clean Vehicle Emissions and Sales Standards.** EEA must develop and implement policies and programs to accelerate electric vehicle adoption in the next 5 years instead of waiting for California regulations (ACT Rule, Advanced Clean Car II standards) to come into effect. In addition, EEA must push to adopt the higher sales target of the Advanced Clean Truck (ACT) rule and commit to 50% of sales being electric by 2030 and 100% zero-emission sales by 2045.
4. **Set 100% electrification targets.** The CECP Plan must explicitly prioritize the electrification of the medium-and heavy-duty vehicle sector, starting with transit and school buses. Setting 100% electrification targets for transit and school buses (2030), commuter rail (2035) and municipal and state (2035) fleets is strongly recommended.
5. Establish the **equity advisory board by summer 2021 and empower the Board to shape Transportation Climate Initiative implementation.**
  - a. The CECP must outline a commitment to increasing investment of TCI-P proceeds from 35% to at least 70% in transit dependent and overburdened communities. The CECP must create a detailed plan for public engagement.

6. **Implement Low Carbon Fuel Standard (LCFS)** by providing details of biofuels under consideration, safeguards related to their transportation, and commit to an early and meaningful public engagement process with EJ populations.
7. Offer MOR-EV Rebate at **Point of Purchase by 2021** and implement rebate **programs for moderate-and low-income residents** to purchase new and used EVs by 2022.
8. **Build out charging infrastructure for electric vehicles.** The CECP needs to set a numeric target for the number of charging stations needed in the next decade to meet our ZEV goals.
9. **Encourage off-peak charging** by committing to analyzing alternative utility rate structures and barriers to Direct Current Fast Charging (DCFC) stations in 2021. In addition, the CECP must make clear the implementation of time-varying rates and residential charging incentive programs by summer of 2022 to encourage off-peak charging.

Buildings:

1. **Cap on heating fuel emissions must be implemented in 2022, in conjunction with other measures toward deep energy retrofits, weatherization, and electrification for existing buildings accompanied by funding, financing, and technical support for low- and moderate-income people and EJ populations.**

As the majority of the 2.5 million buildings in Massachusetts will still be standing in 2050, the need to decarbonize existing buildings is paramount. The proposed heating fuel emissions cap (the cap) is the most critical solution proposed in the interim CECP to tackle this subsector. We agree with EEA that the cap is essential to reaching the 9.4 MMTCO<sub>2e</sub> reduction in emissions from buildings by 2030, the largest cut by sector in the CECP. Concurrently with the cap, EEA must take aggressive action with other policies to ensure that the cap drives carbon reductions, primarily through electrification and a swift phase-out of fossil fuel combustion in buildings, rather than through a focus on biofuel blending. DOER must not delay in convening the Commission on Clean Heat and the Task Force on Clean Heat, and must endow these bodies with a strong mandate to advance complementary policies that are needed to decarbonize existing buildings, including development of a statewide building performance standard and benchmarking and disclosure requirements. These should not just be performance-based, but also prescriptive when appropriate to move the market, such as through the use of turnover cycles as mandatory conversion points. The cap must be in effect by 2022, with declining cap levels over time.

This program must be science-based and advance equity and climate justice. The revenue from the cap must be used toward a just transition for low-and-moderate income people, EJ populations, and renters, through subsidies, incentives, rebates, and technical assistance in making their homes weatherized and more energy efficient and converting their heating and cooling to non-fossil fuel systems.

2. **Adopt a non-combustion, high efficiency net zero stretch code for municipal opt-in by 2020.** We ask that the CECP outline a timeline that makes clear the net zero municipal opt-in stretch code be adopted as a statewide code no later than 2025. The new opt-in net zero code for all new construction should integrate passive-house level energy efficiency, accelerate the

shift to electrification, and optimize renewable energy. Moreover, the stretch code would then become the base building code by 2028. Such codes are necessary to reach high levels of energy efficiency, electrify buildings, and maximize renewable energy, either onsite as practical or offsite, and to meet the needs of cities and towns – as well as the state – in both the near- and longer-term. Robust stakeholder engagement, including extensive outreach to EJ populations from the start, must accompany all of these code development processes.

3. **Workforce Development and Worker Protections.** Massively scaled-up workforce development funding and training will be key in decarbonizing our buildings. Transitioning the buildings sector requires training laborers in climate-smart building technologies, especially related to HVAC, onsite solar, heat pumps, deep energy retrofits, and building operations. Expanding a largely static industry offers new opportunities for thousands of long-term, sustainable, good paying jobs installing and maintaining new technologies. Further, the 2030 CECP should commit to resources for training workers in the fossil fuel industry to be ready for employment opportunities and benefit from decarbonization.
4. **Create a climate bank to fund the transition.** The goal for establishing a large-scale statewide financing program or climate bank is to coordinate and disseminate a diverse portfolio of funds. Decarbonizing the building sector decarbonization (non-fossil fuel) by 2025 will require paying for deep energy retrofits (that build on the models of Energiesprong and RetrofitNY), investing in scaling up workforce development programs, financing local and district-scale projects, renewable energy generation, and projects that advance both GHG reductions and climate adaptation or resilience. We also ask that EEA remove existing barriers to decarbonization in other state funding/financing programs, such as the Community Preservation Act (CPA) and Massachusetts School Building Authority (MSBA).

Electricity:

1. **Support EJ populations in accessing the benefits of renewable energy generation.** The CECP must bolster existing programs like the MA Solar Loan and (the new defunct) Heat Smart. The CECP Plan must develop customer-facing programs to remove financial barriers to access by mandating that a minimum percentage of participants in customer-facing clean energy programs are from environmental justice communities and low and moderate-income electric customer categories. Additionally, the CECP Plan must create and enhance incentives and regulatory carve-outs to encourage development of community shared distributed energy resources and microgrids in environmental justice communities. These communities should receive at least 50% of statewide clean energy investments at no cost.
2. **Revise regulations (310 CMR 7.75) to reach 100% electricity from non-emitting sources by 2035.** The EEA must revise 310 CMR 7.74 to stop further procurements of electricity from large Canadian hydro generators.
3. **Create a multi-state initiative in 2021 to reform or abandon the Forward Capacity Market by 2025 as necessary.** EEA must make the Forward Capacity Market compatible with future climate protections and climate justice policies.
4. **Raise clean energy standard to 100% renewable electricity by 2035.** We strongly advise the CECP Plan specifies setting a minimum target of 6GW of offshore wind be installed by

## Grassroots Organizations Comments on the 2030 Clean Energy and Climate Plan

2030. We also strongly recommend the CECP Plan specify setting a minimum target of 9300 MW of solar by 2030, while at the same time incentivizing development near existing loads.

5. **Remove clean energy incentives for woody biomass or solid waste combustion. By 2022, remove clean energy incentives for biomass** and solid waste combustion ("waste-to-energy") and make this effective for all EEA programs, including the RPS, APS, CES, and CPS. By 2028, EEA must conduct a strategic review of the impact of clean energy incentive programs on the Commonwealth's ability to meet the 2050 net zero requirement of clean energy incentive programs to guide further adjustments to program eligibility.
6. **Do an assessment of grid infrastructure upgrade needs** for electrification of housing and transportation and significant additional renewable generation by 2022 and start implementation in 2023 with a prioritization investment in low-income communities at no costs to energy burdened residents.

### Summary

A just transition will only be achieved if EEA enacts policies that bring about concrete improvements in the health and lives of communities in the Commonwealth, and especially for those that continue to be disproportionately impacted by pollution and experience the worst impacts of climate change and COVID-19 – environmental justice communities. These policies must be holistic, developed and implemented with community participation. Only by leading with a vision of climate justice will Massachusetts create an equitable path to net zero emissions. Moreover, the final CECP should provide additional details to ensure we achieve widespread transportation and building electrification in a way that works for low- and moderate-income families and workers, expand our renewable energy supply, achieve a 50 percent reduction in GHG emissions by 2030.

Thank you for considering our comments. Getting the Commonwealth on the path to achieving net zero emissions by 2050 in a way that benefits all Massachusetts residents is our vision. Please contact Sarah Dooling of Massachusetts Climate Action Network ([sarah@massclimateaction.net](mailto:sarah@massclimateaction.net)) with questions.

Sincerely,

Sarah Dooling, Executive Director, Massachusetts Climate Action Network

Fran Ludwig, Lexington Global Warming Action Coalition

Jeanne Kreiger, Progressive Democrats of Massachusetts

March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street  
Boston, MA 02108

Re: Comments on the Draft Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides:

The Gas Leaks Allies submit these comments on the draft [Clean Energy and Climate Plan for 2030](#) (2030 CECP) for your consideration as you finalize the Interim Plan. The [Gas Leaks Allies](#) are a coalition of more than 25 organizations and researchers<sup>1</sup> focused in the short term on reducing methane emissions from the gas distribution system in the Commonwealth while developing strategies to transition in the long term to carbon-free renewable thermal energy sources for heating our homes and businesses.

We appreciate the thoughtful efforts by the Executive Office of Energy and Environmental Affairs to plot a way forward to meeting our interim carbon reduction goals by 2030. As part of our comments, we fully endorse the thorough and comprehensive analysis of the 2030 CECP contained in the joint letter from a broad group of climate stakeholders, as well as those submitted by the Acadia Center. Because our expertise and advocacy are focused on the gas distribution infrastructure, most of our comments relate to Chapter 3, Transforming our Buildings, and Chapter 4, Transforming Our Energy Supply. We have five major recommendations:

1. Decarbonize buildings by delivering geothermal energy instead of natural gas.
2. Give the Commission on Clean Heat a broad mandate to make a real difference.
3. Use accurate calculations to measure baseline methane emissions and any emissions reduction from leak repairs to achieve meaningful emission goals.
4. Ensure a just transition to a clean energy future for environmental justice communities and for gas workers.
5. Preclude injection of hydrogen or renewable natural gas into the gas distribution system.

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<sup>1</sup> Gas Leaks Allies participants include Arise for Social Justice, Boston Climate Action Network, Boston Park Advocates, Brookline GreenSpace Alliance, Clean Water Action, Climate Action Business Association, Climate Action Now – Western MA, Climate Code Blue, Climate Finance Action, Climate Reality Project MA Chapter, Community Labor United, Conservation Law Foundation, Emerald Necklace Conservancy, Friends of the Public Garden, Garden Club of the Back Bay, Gas Safety Inc., Greater Boston Physicians for Social Responsibility, Green Committee of the Neighborhood Association of Back Bay, HEET, Longmeadow Pipeline Awareness Group, Mothers Out Front, No Ashland Pipeline, SAFE - Salem Alliance for the Environment, Sierra Club Massachusetts Chapter, Speak for the Trees, Springfield Climate Justice Coalition, Twodegrees@greenneighbors.earth, 350 MA, Dr. Margaret Cherne-Hendrick of Fresh Energy, Dr. Nathan Phillips of Boston University.



Because the 2030 CECP has scant discussion of the gas distribution infrastructure, before getting to specific recommendations, we provide extensive background in our first recommendation on the challenges and opportunities faced by gas companies as they take steps to meet the Commonwealth's decarbonization mandates.

## **1. Decarbonize buildings by delivering geothermal energy instead of natural gas.**

To combat the adverse effects of climate change, the Commonwealth has committed to reducing greenhouse gas emissions to net zero by the year 2050. To ensure that we meet this important goal, it is necessary to have interim targets so that progress can be steady and consistent.

According to current greenhouse gas emissions inventory, the use of natural gas as a source of thermal energy for space and hot water heating contributes 27 percent of the Commonwealth's emissions. As the 2030 CECP indicates, decarbonizing over two million buildings is an immense challenge in terms of scale and logistics (p. 32). The 2030 CECP emphasizes the importance of rapid expansion of deep energy efficiency upgrades to the envelope of buildings, as well as encouraging owners of residential and commercial buildings to switch to heat pumps powered by electricity instead of systems powered by on-site combustion of fossil fuels, whether oil, propane, or natural gas. The 2030 CECP is concentrating its efforts in the next 10 years on converting buildings currently heated by oil and propane. The 2030 CECP pays little attention to the gas distribution system, other than to recognize that "a decarbonized gas" scenario is a higher-risk, higher-cost heating scenario than a "high electrification" heating scenario (p. 27), yet the 2030 CECP encourages the Commission on Clean Heat to consider "innovative utility business models to affordably deploy clean heating systems and deep energy retrofits," including the "potential for sustainable and cost-effective market deployment of biofuels, renewable natural gas, and hydrogen for space heating (p. 33)."

No path to reach the net-zero emissions target by 2050 includes business-as-usual operations for the Commonwealth's gas companies. Gas distribution infrastructure, as noted in the 2030 CECP (p. 12), will become stranded assets as we approach 2050. To avoid this spiraling decline, some gas companies are proposing to hold onto their existing pipeline infrastructure by replacing the existing crumbling and leaking pipes with new pipes,<sup>2</sup> and then blending hydrogen or renewable gas with fracked natural gas so that they can continue to deliver combustible, explosive gas into our buildings. The 2030 CECP seems to endorse this process as a tactic to fix gas leaks (p. 46), without considering whether this is a wise long-term strategy, given the acknowledged concern about stranding assets (p. 12). Table 4 in the 2030 CECP recognizes a predicted 5 percent reduction in carbon emissions by 2030 as a result of a "Decarbonized Gas" scenario – a small reduction given the target. Left unsaid, however, is that the blends of either hydrogen or

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<sup>2</sup> Gas companies are attempting to reduce methane emissions by replacing leak-prone pipes as part of the Gas System Enhancement Plan. A local economics clinic estimates the total cost of the statewide pipe replacement over the next 20 years will be greater than the depreciated value of the gas system in the ground. It does not make sense for ratepayers to pay \$17 billion for new fossil fuel infrastructure, when it is unlikely to be in use after 2050. Castigliero, Stasio, Stanton, Fixing Massachusetts' Leaky Pipes: When Will It Be Paid Off? Applied Economics Clinic, <https://aeclinic.org/publicationpages/fixing-massachusetts-leaky-pipes-when-will-it-be-paid-off>.

renewable natural gas are unlikely to replace more than 15 to 20 percent of the fracked gas in the pipelines. In addition, both hydrogen and renewable natural gas have their own problems of cost, safety, and release of toxic emissions both in the home and into the atmosphere, as detailed below and in our appendices. Hydrogen and renewable natural gas are partial and flawed solutions as a strategy to achieve non-emitting renewable sources of thermal energy. While this may be the answer for some gas companies for meeting the 2030 interim targets for 2030, it is not viable as a long-term solution for achieving the Commonwealth's net-zero goals for 2050.

We must therefore look elsewhere for a long-term and efficient alternative to natural gas. Air source heat pumps are one solution, but their widespread installation requires millions of individual property owners to make the switch, one building at a time. By contrast, gas companies as public utilities already have existing networked distribution systems using the public rights of way. They can pilot and then bring to scale the delivery of non-emitting renewable geothermal energy accompanied by ground source heat pumps to heat and cool our homes and businesses.<sup>3</sup> Such pilots are already in the works in the Commonwealth, proposed not only by Eversource and National Grid, but also by the Attorney General's Office using funds from the Columbia Gas settlement of the disastrous gas explosions in the Merrimack Valley in 2018, through a competitive bid process. Eversource has already received approval from the Department of Public Utilities to pilot a geothermal microdistrict project, while National Grid's proposal to the Department of Public Utilities is pending approval. In addition, Section 99 of An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, S. 9 as amended by S.30, permits the Department of Public Utilities to authorize pilot projects for the development of utility-scale renewable thermal energy,<sup>4</sup> expected to become law in the next few weeks.

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<sup>3</sup> Geothermal micro-districts are most appropriate for relatively dense neighborhoods, including mixed-use neighborhoods, but not for all of the approximately 3 million dwelling units in Massachusetts.

<sup>4</sup> SECTION 99. The department of public utilities may, upon application of a gas company as defined in section 1 of chapter 164 of the General Laws, authorize 1 or more pilot projects for the development of utility-scale renewable thermal energy. Such application shall be filed with the department on or before January 1, 2023. The department may, under a pilot, approve recovery of costs for projects situated in the commonwealth that demonstrate the costs and benefits of: (i) utility-scale renewable thermal energy sources, systems or technologies capable of substituting for fossil-based natural gas; or (ii) utility-scale renewable thermal energy replacements for, or alternative uses of, infrastructure constructed originally to generate, transmit or distribute fossil-based natural gas; provided, however, that such substitute renewable thermal energy sources, systems or technologies, and such replacements or alternative uses, have a reasonable likelihood of facilitating substantial reductions in greenhouse gas emissions that satisfy the mandates of greenhouse gas reductions set forth in chapter 21N of the General Laws; and provided further, that the pilots shall not include the blending of other fuels with fossil-based natural gas. The department may, within such a pilot, permit a gas company to bill for thermal energy. The department shall ensure transparency and validity of the outcomes of the pilot projects through a third-party evaluation and report by the department of energy resources. In determining whether to approve a pilot project, the department shall consider the reasonableness of the size, scope and scale of the pilot project and related budget and whether the benefits of the proposed pilot justify the proposed cost to both participating and non-participating customers; provided, however, that the calculation of benefits shall include calculations of the social value of greenhouse gas emissions reductions. The department may promulgate rules or regulations to implement this section.

While varying in detail, these projects build on the existing expertise of gas companies and their workers to dig trenches, bore holes, and lay pipelines in the public rights of way that can then deliver to buildings water that has already been heated to about 52 degrees by the ambient temperature of the ground approximately 200 feet below the surface. Electric heat pumps then boost the temperature to heat the building to the desired temperature. Instead of delivering fracked gas to be combusted inside buildings with the resulting greenhouse gas emissions and safety hazards, the geothermal pipes draw heat from the most powerful thermal energy storage resource, the Earth itself. In the summer, the process reverses, with water in the pipes drawing heat out of buildings and putting it back into the ground, allowing gas companies to deliver cooling in addition to heating through the same pipes – an added benefit to address the increased need for air conditioning as New England summers heat up as a result of climate change.

Because the temperature in the ground is always around 52 degrees, networked ground source heat pumps are twice as efficient as air source heat pumps, which have to heat or cool the seasonal extremes of air to the desired room temperature. For every one unit of energy used, networked ground source heat pumps move 6 units of energy in or out of a building, giving them a Coefficient of Performance (COP) of 6 instead of 3. Because buildings are connected through a network of pipes, the system uses excess temperature from one building to heat or cool another.

Geothermal microdistricts are not a new technology. They have been installed all over the world. What is innovative here is the proposal for gas companies to deliver geothermal energy to thousands of customers through a networked system, rather than through localized geothermal systems serving a few buildings. See Appendix A, listing a wide variety of installations excerpted from the Buro-Happold GeoMicroDistrict Feasibility Study for the Commonwealth.<sup>5</sup>

These geothermal projects can certainly be explored in depth by the Commission on Clean Heat as it undertakes its work in the next two years, but the fact that these projects are underway right now in the Commonwealth should be included in the 2030 CECP itself, to highlight the importance of these promising innovations, and to ensure that they receive the necessary attention and regulatory changes to ensure their success. While gas companies at the direction of the Department of Public Utilities are conducting their own analysis of their future role as the Commonwealth achieves its target 2050 goals,<sup>6</sup> it is nonetheless important to have an independent and concurrent analysis of alternative sources of thermal energy, specifically including utility-scale networked geothermal distribution systems. Compatible with how networked geothermal systems would grow by strategically replacing leak-prone gas infrastructure, the 2030 CECP suggests the possibility “that a planned, geographic contraction of the gas distribution system could further reduce all such natural gas system emissions” (p. 46). The 2030 CECP should explicitly acknowledge that this planned, geographic contraction of the gas distribution system could include replacement with a networked geothermal heating system.

Networked geothermal heating systems solve several problems. The electric grid will not have to absorb all of the load of heating and cooling buildings during extreme weather, whether cold or

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<sup>5</sup> “GeoMicroDistrict Feasibility Study,” Buro Happold, 2019, <https://heet.org/wp-content/uploads/2019/11/HEET-BH-GeoMicroDistrict-Final-Report-v2.pdf>.

<sup>6</sup> <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/12820821>.

hot. There will therefore be fewer periods of peak demand when electricity prices at ISO-New England are at their highest. A networked system built and maintained by a gas company expedites the neighborhood-by-neighborhood, building-by-building transition to renewable thermal energy by transforming the system itself, while ensuring equitable access to clean energy for those who cannot afford on their own to make the switch – a challenge highlighted in detail in the 2030 CECP. While the installation of a networked geothermal infrastructure may have higher initial installation costs than the replacement of existing gas pipeline infrastructure, once installed, it is much cheaper to operate and maintain. The cost of delivering heat as measured in Btus also drops since there is no longer the cost of gas piped into the Commonwealth from fracking fields in other states, but only a relatively smaller cost for the amount of electricity to run the heat pumps and the water pumps.

Instead of allowing the gas companies to slowly decline into a death spiral caused by a decreasing customer base and expensive stranded assets with few ratepayers left to pay the remaining debt, the Commission on Clean Heat can extend a life line to the gas companies – and to their workers and customers – by paving the way for them to develop a networked geothermal infrastructure.

We have four additional specific recommendations for improving the 2030 CECP:

2. **Give the Commission on Clean Heat a broad mandate to make a real difference.**
  - **Provide a list of stakeholders to be appointed to the Commission on Clean Heat.** The 2030 CECP wisely defers the difficult challenges posed by decarbonizing the buildings sector to the Commission on Clean Heat, assisted by an inter-agency Task Force on Clean Heat (p. 32). The task force will ensure broad engagement of executive agencies. It is therefore even more important to make sure that a broad spectrum of stakeholders participates fully as members of the Commission. The 2030 CECP should propose representatives not only from gas and electric companies, but also from environmental organizations, environmental justice communities, labor, municipalities, regional planning organizations such as MAPC, heating and cooling experts, and others who can contribute to the recommendations of this important commission.
  - **Charter the Commission to set equitable goals for emissions reduction, public health improvements, and a culture of safety first.** A broad set of criteria for making decisions will inform the Commission’s process beyond examination of technical solutions to also consider the impact on the public of the transition to clean heat. For example, requiring air quality improvements, especially in low-income areas that suffer from high asthma rates, will improve public health and reduce health care costs. Decisions relating to labor and workplace conditions will help emphasize safety first as central to the utility culture.<sup>7,8</sup> Independence gives the Commission freedom to explore

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<sup>7</sup> Ackley, Fairchild, et al., *Rolling the Dice*, September 13, 2019, <https://www.gasleaksallies.org/>.

<sup>8</sup> Dynamic Risk, Statewide Assessment of Gas Pipeline Safety: Commonwealth of Massachusetts, January 29, 2020, [https://drive.google.com/file/d/1O3krJ2XkAAzJc-fv\\_8bYvEqS1KYGxwQR/view](https://drive.google.com/file/d/1O3krJ2XkAAzJc-fv_8bYvEqS1KYGxwQR/view).

answers in depth and to adopt innovative solutions. Chartered goals give the Commission broad context for its work.

- **Instruct the Commission to propose incentives to encourage, and mandates to require, the conversion of buildings to non-emitting renewable thermal energy.** As the 2030 CECP indicates, the buildings sector is the hardest to convert to clean energy. Net-zero emissions will not happen without bold action and transformational change in the gas distribution system, induced through rigorous market transformation and directed through regulatory mandates. There must be coordinated market strategies with Mass Save, the gas companies, and an independent public information campaign.<sup>9</sup> It will take more than waiting for end-of-life replacement of heating systems in individual buildings to affect the magnitude of transition that will be required in the next 10 years, or even in the next 30 years. It will be necessary to use a “carrot and stick” approach, with proven market transformation techniques used alongside social marketing and other motivational efforts. Tax credits, low-interest or no-interest loans, discounts, and subsidies are but a few options. An inventive Commission can look to other jurisdictions across the US and the world for strategies that have proved effective.
- **Instruct the Commission to re-envision the uses of Gas Safety Enhancement Plan funds.** Enacted in 2014 in response to widespread gas leaks emitting methane and killing street trees, the Gas Safety Enhancement Plan (GSEP)<sup>10</sup> addresses the Commonwealth’s crumbling leak-prone pipeline infrastructure by enabling gas companies to finance the replacement of approximately 25 percent of existing gas pipelines through assessments to ratepayers that are approved by the Department of Public Utilities. These costs are amortized over a period of 30 to 50 years. This timeframe runs headlong into the Commonwealth’s mandate to achieve net-zero emissions by 2050, with the result that the new gas pipelines will likely not be paid for by the time they are obsolete. According to the Applied Economics Clinic, gas companies are on track to dig roughly \$14 billion worth of assets into the ground that will be stranded.<sup>11</sup>

The Commission should analyze the existing GSEP funding structure to determine its compliance with the net-zero mandates and make recommendations to the Legislature and the Department of Public Utilities to authorize the use of those funds to install utility-scale non-emitting renewable infrastructure. GSEP funds should also be available for making long-term repairs using the latest in pipe repair technology, a solution that is significantly less costly than pipeline replacement. Such repairs will reduce methane

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<sup>9</sup> One need only look at the successful campaign to convince Americans to stop smoking to see what creative public information campaigns can accomplish.

<sup>10</sup> Chapter 149 of the Acts of 2014, An Act Relative to Natural Gas Leaks. <https://malegislature.gov/Laws/SessionLaws/Acts/2014/Chapter149>.

<sup>11</sup> Castigliero, Stasio, Stanton, Fixing Massachusetts’ Leaky Pipes: When Will It Be Paid Off? Applied Economics Clinic, <https://aeclinic.org/publicationpages/fixing-massachusetts-leaky-pipes-when-will-it-be-paid-off>.

emissions and allow the existing infrastructure to last until it can be replaced by non-emitting sources of thermal energy.<sup>12</sup>

- **Instruct the Commission to conduct its own analysis of alternatives to natural gas to supplement recommendations from the DPU 20-80 inquiry.** With a broad charter and the independence brought by stakeholder members, the Commission has the ability to examine options that gas companies constrained by regulatory requirements from the Department of Public Utilities and fiduciary responsibilities to shareholders may not consider. The Commission can act as an alternative body to the DPU 20-80 process to ensure that all pathways to providing non-emitting, renewable, and equitable heating and cooling are evaluated for implementation well in advance of 2050.

### **3. Use accurate calculations to measure baseline methane emissions and any emissions reduction from leak repairs to achieve meaningful emission goals.**

- **Correct the estimated reduction in methane emissions from the natural gas distribution system.** The reductions in methane emissions reported by the 2030 CECP resulting from upgrades to the natural gas distribution system are not accurate. The underlying calculations were modified in 2015 without adjusting the greenhouse gas inventory baseline. The effect was a dramatic, reported decrease in methane emissions without a related improvement of the distribution system and is therefore a distortion of our progress in reducing methane as a greenhouse gas (pp. 4, 11, 44, 54).
- **Monitor methane in the atmosphere beyond that leaking from the natural gas distribution system.** A substantial gap exists between estimates made by the gas industry of methane emissions from leaks in the gas distribution system and measurements made by scientific analysis of methane in the atmosphere. Multiple studies going back to 2015 have measured anthropogenic methane in the atmosphere over urban areas, including Boston, and have found it to imply methane emissions as much as six times higher than the estimated emissions from the natural gas distribution system. The conclusion is that we are monitoring only a fraction of actual methane emissions and have no plan to reduce the rest.

Without accurate measurements, especially of the damaging impact of methane in the atmosphere, EEA is making decisions on future pathways for heating based on faulty data, and therefore calculations of progress can have little meaning. Appendix B discusses this fundamental misrepresentation.

### **4. Ensure a just transition to a clean energy future for environmental justice communities and for gas workers.**

- **Prioritize environmental justice communities in the transition to clean energy, with measurable targets with specific timeframes.** Gas and electric companies know which

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<sup>12</sup> An Act Relative to the Future of Heat in the Commonwealth lays the groundwork for steps in this direction. <https://malegislature.gov/Search?SearchTerms=hd3472>, <https://malegislature.gov/Bills/192/SD2340>.

of their customers qualify for lower utility rates and can therefore prioritize neighborhoods for expedited transition projects (pp. 10-11). The installation of utility-scale non-emitting renewable infrastructure delivering thermal heat will spread the costs of installing new infrastructure across all ratepayers. It will avoid the slow and inefficient building-by-building approach required by conversion to air source heat pumps, where more affluent and well-informed owners will take advantage of individual incentives and will abandon the gas distribution system, leaving a dwindling number of low income ratepayers to pay for stranded assets, even as the cost of delivering gas rises.

- **Provide subsidies and incentives for renewable thermal energy installations and building retrofits.** As recognized by the 2030 CECP, the transition to decarbonized thermal energy using heat pump technology requires not just an alternative to natural gas but also upgrading the electrical systems in buildings to be able to run the heat pumps. It also requires tightening building envelopes through weatherization and insulation. As the 2030 CECP recommends, Mass Save needs to expand its energy efficiency programs to include these essential retrofits.

The plan for electricity upgrades, weatherization, and insulation must make sure that underserved, environmental justice low income and frontline communities are included.<sup>13</sup> The members of those communities can least afford to upgrade their homes. An uninsulated house typically can use three times as much energy as an insulated one.<sup>14</sup> Several hundred thousand of the 3 million dwellings in the Commonwealth are rental units. The plan must ensure that landlords opt to participate so that renters in 37 percent of homes in the Commonwealth can benefit from these upgrades.<sup>15</sup> Otherwise they contribute to the cost of the Mass Save programs without receiving much of the benefit.

- **Develop a strategy to motivate and enable consumers to install renewable energy heating systems based on renewable energy.** Meeting the 2030 CECP goals will require motivating consumers to purchase appliances and heating systems powered by renewable electric energy even before the useful life of these appliances and systems has been exhausted. Changing customer behavior is a complex challenge and will require not only ingenuity in marketing strategy but also financial support. Engaging a consultant to develop a marketing strategy and providing funding to assist low and moderate income homeowners in purchasing equipment that uses electricity instead of fossil fuel will

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<sup>13</sup> A heat pump will require at least 100-amp and possibly 200-amp service. A large percentage of these homes will likely have only 60-amp service with knob-and-tube wiring that must be removed before insulating.

<sup>14</sup> By using three times as much energy to heat, every 100,000 of these uninsulated homes are equivalent in energy use to 300,000 insulated homes. And that is not counting the energy used to cool with window unit air conditioners.

<sup>15</sup> Implicit in the 2030 CECP's program to install heat pump technology in one million homes and to ensure fair and equitable participation to underserved, environmental justice, low income and frontline communities is a commitment to subsidize retrofits in those communities.

expedite the transition. Such a consultant would be independent of the fuel switching constraints that hamper gas companies. Again, any strategies must include incentives for landlords, so that tenants are not left out of this important transition (p. 11).<sup>16</sup>

- **Include specific provisions to create a just transition based on labor standards and equitable workforce development.** While the draft 2030 CECP notes that jobs in renewable energy are likely to grow and that workforce development is needed (pp. 5, 11, 32), the final 2030 CECP must go further and include recommendations for high-quality employment and procurement policies to make adequate provisions for a just energy transition. Addressing labor concerns must begin with input from labor leaders who are already presenting plans with recommendations on how the Commonwealth’s energy transition can produce jobs that sustain families, align with best labor practices, and also be just and equitable. Specific recommendations include requirements for prevailing wages and Project Labor Agreements to ensure high-quality jobs and the most highly-trained as well as diverse, inclusive workforce available. The 2030 CECP should include such details as those provided by the Massachusetts AFL-CIO in its comments on the Interim Plan. Two recently filed bills serve as models: An Act relative to a just transition to clean energy ([HD2446](#), [SD1800](#)) and An Act relative to clean energy workforce standards and accountability ([HD3200](#), [SD1801](#)).<sup>17</sup>

## 5. Preclude injection of hydrogen and renewable natural gas into the gas distribution system.

- **Clarify areas where hydrogen can be useful while fully disclosing and avoiding its limitations.** Hydrogen intended as a gas substitute is made from fracked gas; there is no significant portion that is green. Effective uses of hydrogen are for transportation fuel cells, especially heavy-duty vehicles, and for some high heat industrial processes where it is used on site, rather than transported via pipelines. To address intermittency on the grid from renewable resources, green hydrogen batteries are useful.<sup>18</sup> Hydrogen is not a viable

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<sup>16</sup> This strategy could be driven by an entity under the direction the Energy Efficiency Advisory Council, as long as it is independent of Mass Save, which is administered by the utilities. While utilities and Mass Save have an important role to play, it is unlikely that they can carry out the required level of market transformation on their own.

<sup>17</sup> The first bill calls for the establishment of a just transition office to develop a just transition plan for the energy sector to ensure immediate access to employment and training opportunities in clean energy industries and related fields, to work with clean energy businesses to ensure they act as responsible employers to further workforce and economic development goals, and to increase access to employment and training opportunities in clean energy industries and related fields for residents of environmental justice communities. The second bill outlines key aspects of workforce development that must be stipulated, including education, training, cross-training, and re-training, support services, and adequate re-employment opportunities. It specifies work to be done with MassCEC, funding needed to implement development plans, and stipulations for contractors and subcontractors.

<sup>18</sup> LADWP, Intermountain Power Project and Green Hydrogen Storage, July 2020, [https://ww2.arb.ca.gov/sites/default/files/2020-07/ladwp\\_cn\\_fuels\\_infra\\_july2020.pdf](https://ww2.arb.ca.gov/sites/default/files/2020-07/ladwp_cn_fuels_infra_july2020.pdf).



source of thermal energy to be piped into buildings as a simple substitute for natural gas. The synthesis process from methane adds cost, rendering it uncompetitive with renewable electric energy. Its production from methane contributes to emissions as the methane is transported from wellhead to delivery site. Because it is a smaller molecule than methane (gas), it is more likely to leak than methane as it can escape through smaller fissures. While testing is ongoing, American appliances and burners are likely not compatible with a hydrogen blend of more than 15 percent. Using such a blend would require new metering, regulators, and appliances. It is better to replace gas appliances with those powered by electricity than to attempt to retrofit gas stoves or gas furnaces and boilers. More combustible than methane, hydrogen has its own safety and health hazards, including fire, explosion, and the release of nitrous oxide. Its combustion releases up to 6 times more nitrous oxides than the combustion of methane, exacerbating respiratory ailments. Finally, hydrogen will embrittle steel pipes, potentially causing catastrophic breaks. See Appendix C for more information about hydrogen as an energy source.

- **Clarify areas where renewable natural gas can be useful, while fully disclosing its limitations.** Wastewater, landfills, food waste, and animal manure all release methane that should be captured and converted to renewable natural gas (RNG), where it can be used onsite to generate electricity. Methane from these sources is not sufficient to meet the heating demand in Massachusetts. A National Grid study estimated that 10 percent of the Commonwealth’s heating demand could be supplied with RNG.<sup>19</sup> Yet RNG is still primarily methane: it can leak and damage the climate just as fossil methane does. The combustion fumes are carbon dioxide, the primary greenhouse gas. Manufacturing RNG through gasification or from plastic through pyrolysis continues the use of fossil fuels, is expensive, has adverse health impacts for nearby residents, and does nothing to clean up our environment. The 2030 CECP should therefore not pose renewable natural gas as a realistic alternative to natural gas as a means of heating buildings. See Appendix D for more information about renewable natural gas as an energy source.
- The Commonwealth should not accept at face value the utilities’ position that piping hydrogen and renewable natural gas into our homes and businesses is a solution. The burden of proof is on the corporations making and delivering hydrogen and RNG. They must show they are cost-effective, safe, and green alternatives to natural gas.

## **Conclusion – The Future of Heat**

Today we are investing billions of dollars into new gas pipeline infrastructure that will not be paid for by 2050, when we are mandated to reach net-zero emissions. We are literally digging stranded assets into the ground. We need a better plan – a plan that can minimize physical risks from explosive gas, minimize climate risks from leaking and burning gas, and minimize financial risks for gas customers and gas companies. Gas companies are public utilities. We the public need our gas companies to continue to keep our buildings warm, to work to ensure our safety, and to do so while cutting greenhouse gases without increasing our energy bills.

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<sup>19</sup> [https://www9.nationalgridus.com/non\\_html/NG\\_renewable\\_WP.pdf](https://www9.nationalgridus.com/non_html/NG_renewable_WP.pdf).

An innovative application of an existing and proven technology – networked geothermal infrastructure – has emerged here in the Commonwealth that can do exactly what is needed. Now is the moment to remove legislative and regulatory barriers to bring this solution to scale, and to create concrete policy initiatives and financing mechanisms to allow for the just and equitable transition the Commonwealth has committed to achieve. The 2030 CECP can put us on this path and keep the Commonwealth in the forefront as a national leader in addressing the climate crisis.

This is the future of clean heat.

Thank you for the opportunity to comment on the Clean Energy and Climate Plan 2030. We look forward to continuing to work with you and the Executive Office of Energy and Environmental Affairs in the implementation of this important Plan.

Sincerely,

Ania Camargo  
Debbie New  
Co-coordinators  
The Gas Leaks Allies

# Appendix A: Case Studies

## 1 Stockton University (Galloway Township, New Jersey)

Stockton University's GCHP system was installed in 1994 to serve the campus' heating needs. It is one of the largest systems in the country consisting of 400 425-foot deep boreholes and 64 miles of underground piping. The capital costs for installing the system were largely covered by utility rebates and state grants. The system has resulted in an estimated 25 percent reduction in electricity consumption, 70 percent reduction in natural gas consumption, and a 17 percent reduction in greenhouse gas emissions.<sup>1</sup>

Characteristics	Description
Project type	Retrofit
System type	Vertical GCHP
System capacity	1,741 tons
Buildings served	480,000 square feet (classrooms, offices, labs)
Installation cost	\$5.1 million (without rebates and incentives); \$2,929 per ton
Estimated savings	\$400,000 per year (O&M savings)
Estimated payback	6 years

## 2 West Union District System (West Union, Iowa)

In 2013, the town of West Union completed the construction of a district GCHP system designed to serve 60 downtown buildings. The district system is owned by the municipality, which leased operation rights to a user group consisting of participating building representatives.<sup>2</sup> Participating buildings were required to install their own heat pumps to use the system. Property owner investments were supported by a special low-interest loan program from two local banks, utility rebates, and USDA Rural Energy for America Program funding. Construction of the public infrastructure portion of the system (i.e., the wells and loops) cost \$2.3 million. This was entirely paid for with a HUD Community Development Block Grant, EPA Climate Showcase, and DOE funding.<sup>3</sup> According to the DOE, the total investment, including cost-shares from other federal agencies and the local utility, was \$8.7 million.<sup>4</sup>

Characteristics	Description
Project type	Retrofit
System type	Vertical GCHP
System capacity	264 tons
Buildings served	330,000 square feet
Installation cost	\$8.7 million (\$2.3 million for GCHP system), \$32,955 per ton

1 National Wildlife Federation, "Going Underground on Campus: Tapping the Earth for Clean, Efficient Heating and Cooling," 2011.

2 Green 13 and Public Good Initiative, "Implementing District Geoexchange Systems in Canada," 2017.

3 Geerts, Jeff, "How the Town of West Union Built a Transformational Geothermal Project."

4 U.S. Department of Energy, "EERE Success Story--Iowa: West Union Green Transformation Project."

### 3 Furman University (Greenville, South Carolina)

In 2014, Furman University retrofitted ten student housing buildings—nearly 40 percent of its campus student housing—with GCHP systems. The buildings contain 255 apartments serving 1,020 students. The district-scale system is comprised of 20 517-foot deep boreholes. Each building is served by individual heat pumps. The project was partially funded by a \$2.4 million DOE grant through ARRA Funding for Research and Development. The remaining cost was borne by the University through funding that was initially allocated for replacement of existing and outdated HVAC systems. The new GCHP system is expected to save 600 metric tons of CO<sub>2</sub>e annually.<sup>5</sup>

Characteristics	Description
Project type	Retrofit
System type	Vertical GCHP
Buildings served	10 student housing buildings
Installation cost	\$4.9 million
O&M cost	\$17,000 per year
Estimated Savings	\$55,000 per year
Estimated Payback	20 years

### 4 Ball State University (Muncie, Indiana)

Ball State University's main campus occupies 731 acres of land and includes more than 47 major buildings, enclosing approximately 6.5 million square feet of space for academic classrooms, administrative offices, sports facilities, and residence halls. In 2009, the University broke ground on a project to replace its coal-fired boilers and chilled water equipment with a district GCHP system. The system simultaneously produces hot water and chilled water.

Two district energy stations were constructed on opposite ends of the campus. The heat pump chillers in both stations feed hot and cold water into the original distribution system that provided heating and cooling for all major buildings on campus. The district system relies on 3,600 boreholes (400 to 500 feet deep), or about 1,100 miles of piping. The University received a \$5 million grant in 2009 from ARRA through the DOE to pursue the project. The University has offset an estimated 85,000 tons of carbon dioxide emissions annually by retiring its use of coal as a fuel source.<sup>6</sup>

Characteristics	Description
Project type	Retrofit
System type	Vertical GCHP
System capacity	152 MBtu per hour heating (~12,600 heating tons); 10,000 cooling tons <sup>7</sup>
Buildings served	5.5 million square feet
Installation cost	\$82.9 million, \$6,579 per heating ton
Estimated savings	\$2.2 million per year

5 Redderson, Jeff, "North Village Ground Source Heat Pumps Demonstration Project," 2015.

6 Ball State University, "Ground Source Geothermal District Heating and Cooling System," 2019.

7 MEP Associates, "Campus Conversion to Geothermal: Ball State University's Conversion to Campus Geothermal System," 2016.

## 5 South Caribou Recreation Centre (British Columbia, Canada)

The South Caribou Recreation Centre consists of a hockey arena, curling arena, and offices. In the early 2000s the South Caribou community decided to replace their 50-year-old hockey arena with a new facility that would use a GCHP system for heating and cooling. The large site enabled the construction of a horizontal earth loop, and the system's construction was completed in 2002. The project received \$60,000 from the Commercial Building Incentive Program from Natural Resources Canada.<sup>8</sup>

Characteristics	Description
Project type	New construction and retrofit
System type	Horizontal GCHP
System capacity	88 tons, refrigeration heat pumps (hockey and curling arena); 24 tons, heating and cooling (offices, change rooms, lobby, etc.)
Buildings served	56,400 square feet
Installation cost	\$868,000 (including incentive), \$7,750 per ton; \$105,000 (horizontal GCHP only), \$4,375 per ton
Estimate savings	\$48,000 per year
Estimated payback	2 years; 3 years without incentives

<sup>8</sup> Oregon Institute of Technology Geo-Heat Center, "Geothermal Direct-Use Case Studies," 2005.

## 6 Alexandra District Energy Utility (British Columbia, Canada)

The Alexandra District Energy Utility (ADEU) is one of the largest ambient heating and cooling district energy systems in North America.<sup>9</sup> Its construction began in 2011 and the most recent expansion was completed at the end of 2016. The system is owned and operated by the City of Richmond. It provides residential customers with space heating, cooling, and domestic hot water heating, and commercial and institutional customers with space heating and cooling.

The system will potentially serve up to 3,100 residential units and 1.1 million square feet of commercial uses at full build-out in approximately 10 to 15 years. It consists of a 11,100 foot distribution network and four networked thermal sources: GCHP systems, ASHP systems, natural gas boilers, and cooling towers. The GCHP component consists of 726 boreholes (each 250 feet deep) distributed across two well fields. The natural gas boilers are used for backup heat, and the two cooling towers provide peak cooling during the summer season. The ASHP component is housed in a satellite energy plant designed to meet the heating and cooling needs of retail spaces. The ADEU system allows for cooling heat recovery and energy sharing between buildings. The system was estimated to have avoided 2,482 tons of CO<sub>2</sub>e by the end of 2017.<sup>10</sup>

Characteristics	Description
Installation type	New construction and retrofit
Project type	Vertical GCHP
System capacity	5.8 MW heating, 7.6 MW cooling
Buildings served	1.7 million square feet
Revenue	\$1.7 million (2017); 37 percent increase from 2016
Cost of sales <sup>11</sup>	\$355,251 (2017)
Estimated Payback	20 years (8.27 percent IRR)

9 Kerr Wood Liedal, Alexandra District Energy Utility. <https://www.kwl.ca/projects/alexandra-district-energy-utility>

10 Lulu Island Energy Company, "2017 Annual Report," 2017.

11 Includes system operating costs, contract services, etc.

## Appendix B

### Unsubstantiated Reduction in Methane Emissions from Natural Gas Leaks.

#### 1. The Interim Clean Energy and Climate Plan has erroneously adopted an unsubstantiated projected reduction in methane emissions from natural gas leaks.

The Interim Clean Energy and Climate Plan 2030 (2030 CECP) assumes a degree of progress in reducing methane emissions in the greenhouse gas inventory that is not substantiated. Based on this unsubstantiated assumption, the 2030 CECP projects that methane emissions from the natural gas distribution system will remain flat through 2030 as reflected in Table 6, and the 2030 CECP expects that the pipe replacement projects undertaken by gas companies under the Gas Safety Enhancement Plan (GSEP) will adequately reduce those methane leaks.<sup>20 21</sup>

The misapprehension arose from the adoption by the Department of Environmental Protection in 2015 of new pipeline emissions factors that skewed downward the estimate of methane emissions from natural gas distribution infrastructure. The skewed result suggested inaccurately that most of the methane emissions reduction goals for 2050 were satisfied. The substantial evidence to the contrary contests whether the 45 percent reduction in greenhouse gas emissions can be achieved by 2030.

The new, and erroneous, emissions factors adopted by DEP came from a Washington State University study of a distribution pipe infrastructure that was much more modern and much less decrepit than the Commonwealth's infrastructure, one of the oldest in the country. In other words, the new factors simply do not apply to the aged Massachusetts pipe material as had been documented in 1990.

The discrepancy between actual emissions and the use of these new, though inapplicable, factors was apparent in the 2015 update to the "Massachusetts Clean Energy and Climate Plan" (Figure 11, Historical and projected emissions (MMTCO<sub>2e</sub>) from leaks in the natural gas distribution

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<sup>20</sup> The 2030 CECP cites *Reducing Methane Emissions from Natural Gas Distribution Mains and Services*, MassDEP regulation 310 CMR 7.73. In 2020, the MassDEP program review to determine whether to modify and extend the requirements in this regulation resulted in an amended regulation.

<sup>21</sup> The metric used by the Interim Plan does not include improvements to behind-the-meter leaks by deploying heat pumps, etc. This does not dispute the priority that the Interim Plan puts on anticipated growth in other, very high GWP gases. "The most impactful strategy for the 2020s is to minimize the growth of non-energy emissions, particularly emissions of high GWP gases associated with uses that are expected to grow through the next decade: HFCs used in refrigeration, air conditioners, and heat pumps, and SF<sub>6</sub> used in gas-insulated electrical infrastructure switchgear." Interim Plan, p.45 [53]. Nor does it dispute the priority put on other sectors in the Interim Plan, such as transportation and HVAC, especially because those areas need attention now due to their long lag times for change. The significant volume of methane released into the atmosphere more than makes up for the fact that the global warming potential (GWP) of methane is far less per pound than HFCs and SF<sub>6</sub>.

system).<sup>22</sup> That discrepancy has been carried over into the draft Interim Plan. Figure 9 erroneously shows a huge reduction in emissions associated with natural gas leaks from 1990 to 2017 that is not reflected in actual emissions reduction.

**Recommendation.** If the new emissions factors were correct for 2015, then they logically were correct for 1990 and should be applied retroactively to the Commonwealth’s 1990 pipe material inventory. That requires a recalculation of the emissions reduction goals for 2030 and 2050. The resulting comparison to 1990 will demonstrate to what extent progress is being made to achieve the Global Warming Solutions Act’s goals.

## **2. Current inventory of methane emissions of natural gas ignores scientific studies of emitted methane that should be counted in the greenhouse gas inventory.**

A substantial discrepancy exists between gas industry estimates of methane emissions from the gas distribution system and methane scientifically measured in the air. That discrepancy became apparent in a 2015 Harvard University and Boston University study<sup>23</sup> by Maryann Sargent, Steven Wofsy, and Lucy Hutyra of Harvard University. They reported: “This year, the McKain et al. study was extended to analyze NG emissions from the Boston area from 2012-2019 using updated models and meteorological products. We found an average loss rate of  $2.5 \pm 0.5\%$  over the 7-year period, with no statistically significant trend in loss rate over that time. The loss rate remains ~[, approximately,] 6 times higher than the reported DEP loss rate as recently as 2019.”<sup>24</sup> Research since then has reported similar results, and other studies have noted a significantly higher level of methane emissions associated with natural gas in urban areas than the industry reported as leakage from the distribution system.<sup>25 26</sup>

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<sup>22</sup> The Local Distribution Companies were quick to note and take credit for this “apparent” improvement from using the new factors as a legitimate decrease in methane emissions<sup>22</sup> in the MassDEP program review of their regulation on methane emissions last year, saying, “As noted in the 2015 Update to the Clean Energy and Climate Plan (“2015 CECP Update”), there has been a 62 percent reduction of natural gas system GHG emissions, which far exceeds the 2020 reductions contemplated by the Global Warming Solutions Act (“GWSA”).”

<sup>23</sup> McKain, Phillips, Wofsy et al. Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts. *Proceedings of the National Academy of Sciences* Feb 2015, 112 (7) 1941-1946; DOI: 10.1073/pnas.1416261112.

<sup>24</sup> The report responded to MassDEP’s program review of the methane emissions regulation. Stakeholder Comments Received: Letter from Maryann Sargent, Steven Wofsy, and Lucy Hutyra of Harvard University, Sep. 18, 2020.

<sup>25</sup> Plant, G., Kort, E. A., Floerchinger, C., Gvakharia, A., Vimont, I., & Sweeney, C. (2019). Large fugitive methane emissions from urban centers along the U.S. East Coast. *Geophysical Research Letters*, 46, 8500–8507. <https://doi.org/10.1029/2019GL082635>

<sup>26</sup> Patricia M. B. Saint-Vincent and Natalie J. Pekney. Beyond-the-Meter: Unaccounted Sources of Methane Emissions in the Natural Gas Distribution Sector. *Environmental Science & Technology* 2020 54 (1), 39-49 DOI: 10.1021/acs.est.9b04657.



These findings suggest significant sources of urban methane emissions associated with natural gas that are independent of the natural gas distribution system itself.<sup>27</sup>

An accurate accounting of leaked natural gas in our atmosphere as a whole is the responsibility of the Commonwealth, and is not entirely the financial responsibility of the gas companies. The DEP needs to report these significant additional natural gas emissions so that the Commonwealth's climate pathways and planning can be based on accurate, complete data.

**Recommendation:** We recommend that the DEP undertake to measure and monitor methane in the atmosphere and add it to the state greenhouse gas inventory in order to be able to determine whether the Commonwealth is actually reducing methane emissions to meet goals Global Warming Solutions Act goals.

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<sup>27</sup> One possibility is leaks “behind the meter” such as leaks from gas pipes inside buildings or unburned natural gas/methane released when gas stoves, furnaces, or other appliances cycle on and off.

## Appendix C

### Hydrogen Is Not a Good Substitute for Natural Gas

There are appropriate uses for hydrogen as a source of clean energy, but a substitute for natural gas to heat buildings is not one of them. Appropriate uses for hydrogen are in fuel cells for transport, for addressing intermittency on the grid, for generating electricity on-site through electrolyzers and fuel cells for buildings, and for some high heat industrial processes. These do not involve the combustion of hydrogen, which produces nitrous oxides. Pipeline distribution of hydrogen as a gas for heating buildings is not viable.

**Emissions from manufacture of hydrogen.** Ninety-five percent of hydrogen currently produced in the United States comes from methane that has been transported from the wellhead to a delivery point. The system to transport methane to the hydrogen manufacturing site is rife with leaks,<sup>28</sup> and once on site, the manufacturing process to turn methane into hydrogen also releases greenhouse gases. Methane transformed to hydrogen using a steam reformation process produces carbon dioxide, also a greenhouse gas. Redirecting our inadequate supply of renewable energy to produce hydrogen is highly inefficient, with some estimates of net energy loss as high as 60 percent.<sup>29</sup> All indicators point to a conclusion that using hydrogen at scale as a widespread source of thermal heat is more expensive than the straightforward electrification of thermal heat through heat pumps. There is no clear cost-effective case for introducing hydrogen as a substitute for natural gas.

**Requirements of a hydrogen gas distribution infrastructure.** Both the metal and the high-density polyethylene pipes and compressors<sup>30</sup> that comprise our current distribution infrastructure are not compatible with the transmission and distribution of hydrogen in concentrations above 15 percent.<sup>31</sup> New gas meters and new gas pressure regulators that reduce the pressure before the gas enters a building may also be required. Moreover, the gas regulators

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<sup>28</sup> The US natural gas industry is leaking way more methane than previously thought. Here's why that matters. The Conversation, July 2, 2018, 6:42am EDT. <https://theconversation.com/the-us-natural-gas-industry-is-leaking-way-more-methane-than-previously-thought-heres-why-that-matters-98918>.

<sup>29</sup> Dale Allen Pfeiffer, The myth of the hydrogen economy, [The Mountain Sentinel](https://www.resilience.org/stories/2006-01-03/myth-hydrogen-economy/), January 3, 2006, <https://www.resilience.org/stories/2006-01-03/myth-hydrogen-economy/>.

<sup>30</sup> Alex Grant, Paul Martin, Chemical Process Development Expert, Toronto, Canada, Hydrogen is Big Oil's Last Grand Scam, Clean Technica, <https://cleantechnica.com/2021/02/24/hydrogen-is-big-oils-last-grand-scam/>.

<sup>31</sup> Hydrogen Hype in the Air, December 14, 2020, Lew Milford, Seth Mullendore, and Abbe Ramanan, Clean Energy Group | Projects: Resilient Power Project, Energy Storage and Health, Phase Out Peakers. <https://www.cleangroup.org/hydrogen-hype-in-the-air/>.

and valves in most gas appliances, such as furnaces, gas air conditioners, hot water heaters and stoves, may need to be retrofitted or replaced.<sup>32</sup>

**Hydrogen is inherently unsafe.** Hydrogen is a gaseous fuel that easily leaks – more easily than the heavier methane. Hydrogen gas (H<sub>2</sub>) with a molecular weight of two is eight times lighter and smaller than methane (CH<sub>4</sub>), which has a molecular weight of sixteen. Like methane, it is explosive. But it is also flammable over a wider range of temperatures and mixtures with ordinary air than methane. It can embrittle metals, making them weaker.<sup>33</sup> Hydrogen is odorless and therefore not detectable as is the case with treated methane. It is incompatible with smell detection agents, burns with a clear flame, and is extinguished with dry powders. Like methane It can cause asphyxiation.<sup>34</sup> Widespread distribution of hydrogen, which is lighter than natural gas, through our leaky pipes is not safe.

**Hydrogen has adverse health effects.** Some scientists believe that the use of hydrogen instead of natural gas will further impair indoor air quality. Combustion of hydrogen can produce up to 6 times more nitrous oxides than combustion of methane. Nitrous oxides trigger respiratory problems like asthma.<sup>35</sup>

**Conclusion.** It requires more energy to produce hydrogen than it does to power electric heat pumps. Hydrogen is therefore not a viable option for heating buildings.<sup>36</sup>

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<sup>32</sup> “If a significant reduction in GHG emissions in the building heating sector is to be achieved through the use of hydrogen, it would be necessary to achieve a higher hydrogen blending share (up to approx. 100%). However, this would require the replacement of all end-customer heating systems.” [Hydrogen in the Energy System of the Future: Focus on Heat in Buildings](#), p. 33.

<sup>33</sup> [https://en.m.wikipedia.org/wiki/Hydrogen\\_safety](https://en.m.wikipedia.org/wiki/Hydrogen_safety); Wikipedia, National Fire Protection Association, [https://en.m.wikipedia.org/wiki/NFPA\\_704](https://en.m.wikipedia.org/wiki/NFPA_704).

<sup>34</sup> University of Florida Environment, Health and Safety Office, <https://www.ehs.ufl.edu/programs/lab/cryogenics/hydrogen/>.

<sup>35</sup> [Nitrogen Dioxide | American Lung Association](#); Mike Menzies, Hydrogen: The Burning Question, <https://www.thechemicalengineer.com/features/hydrogen-the-burning-question/#:~:text=The%20benefits%20of%20hydrogen%20include%3A&text=it%20has%20very%20wide%20flammability>.

<sup>36</sup> July 2020 - Fraunhofer : [Hydrogen in the Future Energy System: Focus on Heat in Buildings](#).

## Appendix D

### Renewable Natural Gas Is Not A Solution

**Replication of a failing system is not a solution.** Significant reduction of greenhouse gas emissions from the buildings sector will require the Commonwealth to transition off natural gas to heat our homes and businesses. We need a new answer to face our current problems of equity, health, safety, and emissions causing climate change. Replicating the leaky, unhealthy, unsafe, system of the past is a failure of American ingenuity and enterprise.

**Supply of renewable natural gas (RNG).** There is not enough naturally produced RNG through anaerobic digestion to supply the demand for heating fuel. A National Grid study estimated that less than one-fifth of the Commonwealth's heating demand could technically be supplied with RNG.<sup>37</sup> Lack of economic feasibility estimated in the same report decreased this estimate to 5 to 11 percent of Commonwealth's need for thermal energy.

**RNG damages the climate.** RNG is still primarily methane, our pipes would still leak, and the gas would damage the climate just as fossil methane does. The combustion fumes are carbon dioxide, the main greenhouse gas.

**RNG is neither safe nor healthy.** Use of methane, no matter its origin, continues the problems with explosions, fires, and noxious combustion fumes detailed elsewhere.<sup>38</sup>

**Manufacturing RNG makes no economic or environmental sense.** Thermal gasification from coal or pyrolysis of plastic diverts energy we could be using directly for heating, it adds unnecessary cost, and it does nothing to clean up the environment.<sup>39</sup> Capturing leaking methane, whether it is from wastewater, landfills, or animal manure, is an important remediation, but the gas should be stored and used to make electricity on site, not piped into our buildings for heat.

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<sup>37</sup> National Grid, Renewable Gas—Vision for a Sustainable Gas Network, 2010, [https://www9.nationalgridus.com/non\\_html/NG\\_renewable\\_WP.pdf](https://www9.nationalgridus.com/non_html/NG_renewable_WP.pdf).

<sup>38</sup> Ackley, Fairchild, et al., Rolling the Dice, 2019, <https://www.gasleaksallies.org/>.

<sup>39</sup> Earth Justice and Sierra Club, Rhetoric vs. Reality, The Myth of Renewable Natural Gas for building Decarbonization, 2020, [https://earthjustice.org/sites/default/files/feature/2020/report-decarb/Report\\_Building-Decarbonization-2020.pdf](https://earthjustice.org/sites/default/files/feature/2020/report-decarb/Report_Building-Decarbonization-2020.pdf).

Sustainable Marblehead

Lynn Nadeau

Comments on the CECP 2030 Interim Plan

March 22, 2021

Context. Marblehead is a town of 20,000 people. Our town is a peninsula, surrounded and pounded by the sea. At times storms cause waves to wash over one of the three roads exiting the town, preventing the passage of cars. There are times when the causeway connecting an area of town is impassible and the people who live at the end of the causeway are prevented from leaving or going to their homes. We are at the mercy of the ocean, winds and mini-tornadoes, extreme weather events and other signs of climate change. We are also at the mercy of sea level rise compounded by superimposed storm surge. We are worried.

Our electricity is imported by power lines from out of town; there is no actual generation of electricity by our Municipal Light Plant; all our electricity is conveyed via ONE underground line that lies between the sea and a marsh.

Our commuter rail lines (accessed in Lynn, Swampscott, or Salem), run through a flood plain/wetland subject to flooding in extreme precipitation events along the Swampscott/Salem border, and across a tidal marsh from Lynn to Saugus that was flooded for 3 weeks in March 2018 and impassable for the commuter rail during that time.

We have no gas stations in town and are dependent on private autos. A bus travels between the Blue Line (Wonderland) and Marblehead about 6 times a day and takes over an hour.

Sustainable Marblehead was formed in 2017 to work with the Town to ascertain the actions that we can take to slow the damage to our homes and lives. This testimony is submitted by Sustainable Marblehead.

Recommendations:

We support a robust and responsible Clean Energy and Climate Plan (CECP), but find this plan has four Big Deficits:

1. There is no funding source defined.
2. The 45% reduction of CO<sub>2</sub>e is not strong enough; the new Roadmap bill passed by the Senate and House targets 50%
3. Targets are unclear, general and not specific enough.
4. We are concerned about the climate burdens on our nearby cities like Lynn, Revere, and Chelsea:

They are heat islands,

They are commuted through by vehicle traffic which pollutes their air,

They have old housing stock which is energy inefficient: hotter in the summer and colder in the winter.

Funding and Planning is needed for the projects like urban tree planting, insulating homes, extending the Blue Line of the MBTA to Lynn.

Specifically, also, along with the Sierra Club:

Transportation Sector:

The Climate Plan ignores the vital importance of robust, regular, varied PUBLIC transit options across the whole state with town planning models which will reduce vehicle miles traveled. Public Transit should be planned to transition to electric and non-polluting.

Electrifying commuter rail and increasing frequency of commuter rail services, so that more people from the wealthier communities that ring the inner suburbs of Boston, can commute by pollution free public transit, and not injure their neighbors while commuting by car to Boston.

Electrification sector: we urge you to include the following in the Climate Plan:

Raise the clean energy standard to 100% renewable electricity by 2035. That way as people electrify their transportation (cars, buses, trucks, delivery vans) the electricity itself will be CLEAN.

Set a minimum target of 6 GW offshore wind installed by 2030

Set a minimum target for 9300 MW of solar by 2030, while at the same time incentivizing development near existing loads

Create targeted incentive programs for local renewable electricity for low and moderate-income, energy burdened residents, and residents of EJ communities.

These communities should receive at least 50% of statewide clean energy investments at no cost.

Remove “clean energy incentives” for woody biomass or solid waste combustion. This was studied by Manomet Institute in 2010 and the conclusion was that burning biomass for electricity generation is not renewable or clean, and is inefficient.

Do an assessment of grid infrastructure upgrade needs for electrification of housing and transportation and significant additional renewable generation by 2022 and start implementation in 2023, with a prioritization investment in low income communities at no costs to energy burdened residents.

Housing and Building Sectors: we urge you to amend the plan so as to:

Establish net-zero opt-in stretch code in 2022 and statewide base code adoption by 2025.

Create workforce development and training programs for citizens of environmental justice communities, in clean energy technology, through community colleges or vocational training in high schools. Employment opportunities should be provided with labor partners to ensure good paying, union-certified, building-sector jobs needed to rapidly retrofit existing buildings to be energy efficient, and to install new technology such as residential solar or residential electricity storage (home power walls).

Stop all fossil fuel heating incentives through MassSave by 2022.

Create a climate bank funding program to pay for the transition

Set mandatory GHG emissions reduction limits on the thermal emissions from buildings statewide by 2022 (enforcement starting by 2025) via a declining limit on CO<sub>2</sub>e from heating fuel suppliers and investment in comprehensive whole home retrofits of heating, cooking, hot water heating.

Make sure that low and moderate income households and small businesses qualify for assistance in electrification: when retrofitting to electric their homes' heating, hot water, or cooking appliances, to reduce fossil fuel use. Mechanisms including on-bill, zero-interest financing of retrofits, of health and safety repairs, and of weatherization, need to be underwritten by the state to promote electrification and end fossil fuel use in these appliances.

Building materials need to be reexamined through the lens of the green house gas emissions of typical construction materials such as concrete, and lower emission materials need to be required.

# WEST BOYLSTON MUNICIPAL LIGHTING PLANT

4 Crescent Street, West Boylston, Massachusetts 01583

Telephone (508) 835-3681 Fax (508) 835-2952

March 22, 2021 (Submitted by Email)

Executive Office of Energy and Environmental Affairs  
Secretary Kathleen Theoharides  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Subject: Comments on the Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides,

Thank you for the opportunity to submit comments on the Clean Energy and Climate Plan for 2030 (CECP). The owners and ratepayers of West Boylston's municipal lighting plant (WBMLP) appreciate and support the Commonwealth's efforts to decarbonize. Like many Massachusetts' municipal light plants, WBMLP leads the Commonwealth in owning and/or purchasing clean, non-greenhouse gas (GHG) emitting energy supplies. WBMLP looks forward to working together with the Executive Office of Energy and Environmental Affairs (EEA) on the shared objective of further reducing greenhouse gas (GHG) emissions from our energy sector.

Please accept the following comments related to the CECP:

- West Boylston's ratepayer, through their locally elected Board of Light Commissioners, adopted a Greenhouse Gas Emission Standard (GGES) in February 2020. The GGES requires WBMLP purchase 100% of its energy from non-GHG emitting sources by 2050.
- WBMLP's non-GHG emitting energy supply, as a percentage of sales, was 50% in 2020 and we are already planning further emission reductions to meet our interim 75% goal by 2040 and 100% goal by 2050.
- EEA failed to include in the CECP the MLP Greenhouse Gas Emission Standard (GGES) legislation, originally filed as a bill in January 2019 and is expected to become state law this year. All (41) MLPs support this legislation that achieves the same 2050 "net-zero" GHG emission reduction goal applicable to distribution companies and competitive energy suppliers.
- EEA comments on page 40 of the CECP fail to recognize the existing clean and renewable energy supply of West Boylston's MLP and misleads the public by inferring MLPs have not reduced GHG emissions. Although MLPs make up 14% of the Commonwealth's energy consumption and are not regulated, West Boylston's annual



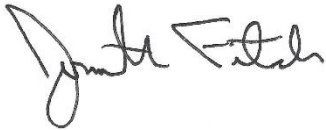
clean and/or renewable energy supply exceeds the current requirements of the renewable portfolio standard (RPS) and clean energy standard (CES).

- EEA failed to include in the CECP the cumulative energy sector GHG reductions requirements mandated by the current RPS, CES, CES-Existing, Clean Peak Standard (CPS) and regulation 310 CMR 7.74. The consumers and ratepayers who pay for these requirements deserve to know what the current legislation requirements are before new legislation is proposed. For example, if you stack the cumulative RPS, CES, CES-E, and CPS requirements, 100% of the Commonwealth's energy supply will be clean and renewable by 2039 without further legislation.
- CECP states MLPs "have access to a range of clean electricity sources". CECP use of the word "access" is misleading to the public as it does not acknowledge the significant MLP ownership and/or financial commitment to long-term contracts MLPs have for both clean and renewable energy supplies.
- CECP states "ensuring MLP electricity supplies are decarbonized on pace is critical to achieving both a 45% reduction in emissions below the 1990 baseline in 2030 and net-zero in 2050. WBMLPs energy supply is 50% decarbonized today and mandated through our GGES to achieve net-zero by 2050. Most MLPs exceed the current pace of decarbonization.
- Hydroelectricity is an important component of West Boylston's long-term clean energy supply. WBMLP imports low-cost, clean hydroelectricity from New York and Canada. Our recent contract for Canadian hydroelectricity is the same clean energy the Commonwealth procured through its 83D RFP, except West Boylston's MLP owns transmission rights to import these clean energy resources without building new transmission lines, which helps maintain low electricity rates for our owner/ratepayers.
- Nuclear power is another critical component of WBMLPs clean energy supply. WBMLP owns a proportional share of the energy, capacity, and attributes of two clean energy nuclear power plants. Our ratepayers paid for the development and safe operation of these plants, and presently, they generate a large percentage of our clean and low-cost energy. The environmental benefits of non-GHG emitting nuclear energy are just being realized and the CECP failed to mention or consider supporting advanced nuclear power in the Commonwealth.
- Energy sector data in the CECP is three years old and misleading. EEA must publish emission data more rapidly. The CECP references 2017 data when 2019 data is readily available at least for the energy sector. Significant changes occurred since 2017, for example, on page 35, the 2017 GHG emissions from coal and petroleum are referenced. Coal and oil generation are no longer significant contributors to our state GHG emissions.

Natural gas remains in significant use and for reliability purposes should be treated as the lowest cost, lowest GHG emitting transition fuel as we decarbonize our sector.

On behalf of WBMLP's ratepayers please consider our comments and concerns regarding the CECP.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Fitch". The signature is written in a cursive style with a large initial "J" and a distinct "F".

General Manager



## New England Forestry Foundation Comments on CECP for 2030

March 22, 2021

New England Forestry Foundation (NEFF) is grateful for the opportunity to submit comments on the Clean Energy and Climate Plan (CECP) for 2030. We commend the Executive Office of Energy and Environmental Affairs (EEA) for its leadership in developing this urgently needed plan to address the climate crisis.

For more than 75 years, NEFF has practiced and promoted exemplary forestry on its properties throughout New England, and has assisted other forest landowners to do the same. NEFF currently serves as the administrative agent for the Commonwealth in advancing the Mohawk Trail Woodlands Partnership, and supports New England's forests and communities in mitigating climate change through applied science and policy advocacy. Our staff of 21 includes leaders in progressive silviculture, policy experts, and climate scientists, and the comments below represent a collaborative effort among those disciplines.

Our comments below address three specific weaknesses in the CECP. By addressing these weaknesses, our calculations suggest the Commonwealth could help to seize a New England-wide climate opportunity to remove approximately an additional 650 million tons of CO<sub>2</sub> equivalent from the atmosphere over the next thirty years through reduced forest conversion, improved forest management, and using advanced wood buildings to reduce emissions from high-embodied carbon materials such as steel and concrete. This would enable Massachusetts to complete its goals for carbon neutrality, with scientific rigor and direct impact on atmospheric CO<sub>2</sub> levels. Action must begin in the next 10 years, and be scaled to the enormity of the challenge before us.

Our first area of comment addresses the importance of embodied carbon requirements for state-supported construction. We then discuss the need to consider the full scope of carbon flows when assessing forests' capacity to mitigate climate change. Finally, we provide an overview of how resilient, climate-smart forestry can ensure that Massachusetts forests withstand the stresses induced by climate change now and into the future. Before getting to these three specific recommendations, we want to offer a bit of context and framing.

For climate mitigation to succeed, in the long run we need not just renewable energy but also renewable materials. This idea underlies the idea of the circular economy promoted by Prince Charles and the World Economic Forum in their Sustainable Markets Initiative. Over the last 60 years, the world has gone in the opposite direction. Data from Dovetail Partners (<https://dovetailinc.org/upload/tmp/1584361857.pdf>) shows that while world population increased by 2.45-fold between 1961 and 2017, wood use increased by only 1.6-fold. This means per capita use of a renewable material compatible with a circular economy actually declined. Meanwhile use of the four horsemen of the climate apocalypse—steel, concrete, aluminum and plastic—soared by up to 10 ten times the rate of population growth. Massachusetts has 3 million acres of forests, capable of producing more renewable materials than they do, while simultaneously continuing to sequester carbon in



growing trees and maintaining carbon storage. New England Forestry Foundation commends the recommendations in the CECP as largely compatible with this vision for the Commonwealth's long-term success.

### **Embodied Carbon and Clean Procurement**

NEFF commends EEA for including Strategy L3, "Incentivize Regional Manufacture and Use of Durable Wood Products", in the draft version of the CECP for 2030. We recommend bolstering this strategy by including a policy commitment to low-embodied carbon procurement standards for state-funded construction. One form this policy could take is a quantitative embodied carbon standard or benchmark. Requiring construction materials to meet an embodied carbon standard would help lower emissions from the buildings sector and immediately incentivize the use of local, sustainably harvested wood products, such as mass timber. Over time, as new materials with low embodied carbon levels become available, they would qualify without need for change in the underlying policy. EEA could refer to California's 2017 "Buy Clean California Act" for an example of such a policy.

EEA could alternatively include a procurement policy requiring state construction projects to utilize sustainably harvested, ideally local or regional wood products as the primary material. This policy would also encourage forestry practices for long-term, long-lived wood products in the state and wider region. This type of "wood first" policy has been implemented by the Canadian province of British Columbia, while France has implemented a similar policy requiring the primary material in public construction to be bio-based.

In addition to these strategies, EEA could also include a strategy to require the disclosure of embodied carbon data for state-funded construction projects. This informational policy can help to raise familiarity with embodied emissions among developers, builders, and sustainability managers and serve as a data resource for future reductions efforts. Public leadership in this area of embodied carbon data can dramatically facilitate greater changes in construction decisions, creating positive ripple effects throughout the Commonwealth's building sector.

California and other states that lead in climate action have begun to adopt embodied carbon standards and reporting measures and NEFF urges EEA to set Massachusetts on a path to do the same in the CECP for 2030.

### **Carbon Accounting and Leakage Effects**

When timber harvesting is curtailed in Massachusetts, harvesting shifts to other regions to meet the demand for wood products. Carbon storage that occurs due to reduced harvest in Massachusetts is therefore offset by increased harvesting elsewhere; the atmosphere may see no net benefit particularly if the alternative to Massachusetts harvesting is harvest in a region with a less sustainable forestry regime or less resilient forests. This is the market phenomenon known as leakage, and NEFF would like to reinforce that forest carbon policymaking must take this process into account to be effective.



In light of these considerations, sweeping reductions in harvesting in Massachusetts could have perverse, negative effects for climate mitigation. As calls to ban harvesting in Massachusetts forests have increased from fringe actors, it is important to assess forest carbon fluxes in their entirety, which means including the effects of leakage and carbon stored in wood products in accounting analyses. Understanding the reality of leakage is crucial for effective decision-making about forest carbon. NEFF recommends including a statement to highlight leakage considerations in the CECP's discussion of Strategy L3, for example:

*Recognizing that carbon stored in forests and wood products must be accurately counted in Massachusetts' climate accounting framework, EEA and its research partners will continue to incorporate the carbon consequences of leakage when studying in-state forest management scenarios. Failure to account for leakage impacts could lead to a perverse outcome for the atmosphere, whereby increased harvesting in forests outside of Massachusetts counteracts increased carbon sequestration within our forests. Moreover, EEA will incorporate the full scope of forest carbon flows into its policymaking, so as to arrive at a systemic and complete understanding of the carbon consequences of different forest management strategies.*

### **Managing for Forest Resilience in a Changing Climate**

NEFF would like to reinforce the importance of implementing resilient management in forests that are already being managed. We make this recommendation specifically for forests already under management to avoid suggesting that all forests in Massachusetts should be under management. NEFF believes appropriate creation of forest reserves are also a key part of the Commonwealth's climate strategy.

We are glad to see the understanding of resilient management articulated in the description of Strategy L2, "Manage for Ecosystem Health and Enhanced Carbon Sequestration". Climate change has induced new stressors that are expected to increase forest mortality, endangering carbon stocks and the sequestration potential of Massachusetts forests. According to the US Forest Service's Northern Institute of Applied Climate Science, these threats include more frequent drought and extreme weather events, more frequent pest and disease outbreaks, and greater prevalence of invasive species.

EEA and its partners must work with landowners to implement resilient forest management techniques to defend against these stressors. In light of the urgency of protecting forest carbon stocks, NEFF recommends that EEA incorporate the latest climate-smart, resilient forestry practices into ongoing management. The Commonwealth could see an increase in otherwise avoidable forest-related carbon emissions if it were to pass up the benefits of resilience-enhancing forestry practices.

### **Conclusion**

NEFF's modelling shows that a strategy of ending forest conversion, implementing climate-smart management, and building with mass timber in place of carbon-intensive materials can provide approximately 30% of the emissions reductions New England as a region will need in order to reach net-



zero by 2050. This regional approach to forest-based mitigation can achieve truly significant emissions reductions, but cannot succeed without Massachusetts. NEFF is ready to work together with EEA, agencies, and other partners across the Commonwealth to act on the forest sector strategies outlined in the CECP for 2030. We are pleased to see the attention to detail in the plan's treatment of forest carbon dynamics and the mitigation potential of sustainably harvested, long-lived wood products. In placing emphasis on the need to incentivize low-embodied carbon construction, assess leakage impacts, and implement resilient forestry, these comments should help to refine and deepen the strategies that Massachusetts can take to leverage forests to mitigate climate change.

Thank you for considering these comments.

Sincerely,

**Robert T. Perschel, Executive Director**

A handwritten signature in black ink that reads "Robert T. Perschel". The signature is written in a cursive style with a clear, legible font.

**Frank Lowenstein, Chief Operating Officer**

A handwritten signature in black ink that reads "Frank Lowenstein". The signature is written in a cursive style with a clear, legible font.

**New England Forestry Foundation  
32 Foster St,  
Littleton, MA 01460**

**Bob Perschel** joined NEFF as Ex. Dir. in April 2012. In his 35 years as an environmental professional, he has worked on forestry, large landscape conservation, and wilderness issues. Previously Eastern region director for the Forest Stewards Guild, Bob worked for the forest industry before establishing his own forestry consulting business, including work in Connecticut, and founding the Land Ethic Institute. He is an original co-founder of the Forest Stewards Guild. Bob has a master's degree in forestry from the Yale School of Forestry and Environmental Studies and a psychology degree from Yale College.

**Frank Lowenstein** joined New England Forestry Foundation as Deputy Director in December 2013, and is now COO. He has played a critical role in overseeing and advancing NEFF's climate change mitigation and adaptation work, policy engagement and strategic planning. He also leads NEFF's Exemplary Forestry Center, which seeks to maximize the contributions of New England forests to mitigating damaging climate change. Prior to joining NEFF, Frank worked for more than 20 years for The Nature Conservancy, where he led programs ranging from community-based conservation in the Berkshires and Connecticut's Northwest Corner to leading the organization's global climate adaptation work. He is a Switzer Fellow, a former Senior Fellow in the U.S. Department of State's Energy and Climate Partnership



of the Americas, author of three books including *Clothed in Bark*, and adjunct faculty in Environmental Studies at Brandeis University and the Masters of Sustainability program at Harvard University Extension School.

## A New Forestry Deal for Massachusetts Forest Landowners:

### **I. Massachusetts Forests**

1. Massachusetts has 3.1 million acres of forest covering about 60% of the state. About 650,000 acres are owned by the state while another 350,000 acres are protected by various local agencies, organizations, and individuals. The remaining 2 million acres of forest land is owned by private landowners. Our forests are essential to protect wildlife habitat, provide clean air and water, and provide forest products that we all use and to help mitigate climate change. Harvard Forest's Wildlands and Woodlands – <https://www.wildlandsandwoodlands.org/vision/vision-massachusetts> is a proposal to increase the amount of protected forest from one million acres to 2.5 million acres of forest in Massachusetts, an area equal to half of the State's land area. About 2.25 million acres would be actively managed while 250,000 acres would be set aside as reserves. This ratio is a good one. The crown jewels which offer great hiking, scenic views, and special habitats should be in reserves. The goal is to protect an additional 1.5 million acres but the current trend is 10,000 acres/year. At that rate, it would take 150 years but opportunities for land protection will rapidly diminish in 50 years or less. So, the pace of land protection would have to be ramped up considerably to come anywhere near to achieving that goal. So far, there is no indication that will happen. In order for Harvard Forests Wildlands & Woodlands plan to be achieved, we need A New Forestry Deal for Massachusetts Forest Landowners.
2. But it is not enough to protect forest land, we must also manage it. "In a recent year, the Massachusetts Service Forestry Program processed cutting plans on nearly 24,000 acres with 62.5 million board feet harvested statewide". It may sound like a lot but it is trivial. If we have 3 million acres of private and public forest land that means only 20 board feet/acre is being harvested when the growth rate is at least 10 times that! Increasing forest management would also provide for a more diverse forest that is less susceptible to severe tree mortality from insect pests and tree diseases and would limit the impact on water quality from catastrophic storms by providing for a more diverse age structure. Increasing forest management would also provide for more diverse wildlife habitat especially early successional forest which some wildlife species depend on. <https://www.facebook.com/media/set/?vanity=MikeLeonardConsultingForester&set=a.1692356897511143> - A Comprehensive Photo Album about Forestry

### **II. Benefits that Private Forest Land Provides to the Commonwealth:**

1. Clean air and clean water.
2. Wildlife Habitat for a wide variety of species.
3. Forest Products such as sawlogs for regional sawmills, hardwood cordwood for local firewood businesses, pulpwood for mulch and regional paper mills, wood



chips for regional and local biomass heat and power systems, and wood chips for a regional wood pellet manufacturer.

4. Mitigate Climate Change: Forests in MA sequester 15% of the state's annual carbon emissions annually but with good forest management we could increase that to 25% while greatly reducing our use of imported fossil fuels and negating the need to increase the standard of the MA Global Warming Solutions Act from an 80% reduction in CO2 emissions to 100% by the year 2050 as some recent bills would require. That would prove to be too expensive.
5. Economic benefits: about 20,000 jobs in Massachusetts are sustained by the forest economy. These jobs are in forestry, timber harvesting, forest industries, and wood using industries as well as recreational uses. The New Forestry Deal for Massachusetts Landowners could at least double the number of jobs in the forest economy.
6. Private forest land that is protected saves towns a lot of money in contrast to forest land that is developed because developments need costly town services such as schools, police, and fire protection.

### **III. Major Threats to our Forests:**

1. 2.3 billion board feet of hemlock sawtimber is at risk from the non-native insect pest the hemlock wooly adelgid.
2. 1.0 billion board feet of ash sawtimber is at risk from the non-native insect pest the emerald ash borer.
3. Defoliation by the gypsy moth caterpillar has resulted in tree mortality and slower growth on at least 2 billion board feet of sawtimber.
4. Destructive state sanctioned highgrade logging which removes the best timber leaving a junk forest behind. The results of highgrading as well as insects, disease, overcrowding, and storm damage are that 60-80% of private forest land consists of mostly low-grade junk timber.
5. Non-native invasive plants crowd out native vegetation and prevent adequate forest regeneration. These destructive plants like oriental bittersweet, multiflora rose, Japanese barberry, European buckthorn, Japanese knotweed, and honeysuckle now infest as much as 10% of all forest land in Massachusetts and the problem is getting worse.
6. Up to 80% of our forests have been degraded or are at risk for significant decline by these and other agents including destructive storms.
7. Our forests are releasing more than 4 million tons of carbon every year as more trees decline and die reducing net growth and decreasing carbon sequestration rates.
8. In addition to the reduction in carbon storage, trees that have internal decay release a lot of methane: <https://news.yale.edu/2012/08/08/diseased-trees-are-source-climate-changing-gas> It is a great study on methane produced in our forests. Methane is 30 times more potent as a greenhouse gas than CO2. The methane produced in trees represent 10% of global emissions. Estimated methane emission rate from upland forests is equivalent to burning 40 gallons of gasoline/hectare/year or about 16 gallons of gas/acre/year. Abundant red maple has the highest

concentration of methane which most good foresters discriminate against to favor red oak and other hardwoods.

9. Massachusetts is losing 7,000 acres of forestland/year to development. This deforestation releases more than 7 million tons of CO<sub>2</sub> every year while also reducing future CO<sub>2</sub> sequestration by reducing the total amount of forest land in the Commonwealth.
10. One of the biggest threats to our forests is from the rapid spread of solar “farms” where almost all of the solar panels are manufactured in China. These industrial developments not only destroy forests but also diminish opportunities for local job creation. Over 8,000 acres of land have been covered with solar panels imported from China at a cost of over \$6 billion! But the plan is to destroy up to 160,000 acres of forest and fields in solar “farms” with made in China toxic solar panels. How many tens of billions will that cost?! This makes no environmental or economic sense. Any new solar development should be confined to rooftops (and perhaps brownfields) and the solar panels made in America.
11. President Biden has raised the social cost of carbon to \$51/ton. The social cost price applied to methane is now \$1500 / ton. What is the social cost of carbon?  
The **social cost of carbon** (SCC) is an estimate, in dollars, of the economic damages that would result from emitting one additional ton of greenhouse gases into the atmosphere. The SCC is currently used by local, state, and federal governments for billions of dollars of policy and investment decisions.  
11 million tons emitted by deforestation and forest decline in MA x \$51/ton = \$561,000,000 in economic damages.  
16 gallons methane/acre emitted by decaying trees = 62 lbs. = .031 tons .031 x \$1500/ton = \$46.5/acre for methane x 2,000,000 million acres of private forest land = \$93,000,000.  
So using the new standard of the Biden Administration, the total social cost of greenhouse gas emissions from MA forests due to forest decline and development = \$561,000,000 + \$93,000,000 = \$654,000,000 every single year!  
Investing in Massachusetts forests, forestry, and forest industries to protect and improve our forests would greatly reduce these costs while creating thousands of local real green jobs.

#### IV. Forest Biomass Energy:

Biomass is, in essence, stored solar energy and is a byproduct of our forestry operations which allows us to grow more high quality sawtimber which is the main product. Increased markets for forest biomass have produced more forest improvement cuttings which help landowners: manage their woodlots to a high standard by greatly improving timber quality and species composition; improve wildlife habitat; generates income; increases property values as well as timber values; and encourages landowners to keep their land in forest. Biomass markets and improvement cuttings also provide many real green jobs right up the wood supply

chain and help to provide many different forest products for consumers and a source of clean locally produced renewable energy.

The use of wood for energy is carbon neutral as long as the forests are growing faster than they are being cut. Here in Massachusetts, forests are growing many times faster than they are being cut.

There are numerous studies that show the great carbon benefits of biomass utilization.

Biomass electric power plants should only supply 10% of our power needs at most but the great benefit is the market it provides for low grade junk timber that has few if any other markets and it is essential to have large “anchor tenants” to support the smaller biomass thermal (heat) markets.

Futuremetrics provides information, market analysis, operations guidance, and strategic advice to many of the world's leading companies in the wood pellet industry. They wrote a scientific paper which exposed the erroneous Manomet Biomass Study: <http://futuremetrics.info/wp-content/uploads/2013/07/Manomet-Got-it-Backwards.pdf>

<http://biomassmagazine.com/articles/5531/no-carbon-debt-is-accrued-when-using-woody-biomass-for-energy> No carbon debt for biomass. Futuremetrics expert analysis explains why the Manomet Biomass “Study” was wrong.

<https://www.futuremetrics.info/wp-content/uploads/2019/03/FutureMetrics%20-%20White%20Paper%20on%20the%20Benefits%20of%20Wood%20Pellet%20Heat%20for%20the%20State%20of%20Maine.pdf> - Another outstanding report from Futuremetrics about the benefits of biomass in Maine.

<https://www.canadianbiomassmagazine.ca/study-bc-wood-fuel-could-cut-coal-power-emissions-by-85/> Biomass reduces emissions by 85% compared to coal.

Studies show a 90 - 97% reduction or more in CO2 reductions when switching to wood pellets from oil or natural gas: <http://www.truenorthenergyservices.com/v/>

<http://biomassmagazine.com/articles/16697/the-science-is-clear-on-renewable-wood-energy> - The truth about biomass energy.

<https://futureforestsandjobs.com/blog/> - Huge support for biomass and forestry.

<http://formaine.org/wp-content/uploads/2020/09/FOR-Maine-Wood-Energy-final-9-2018.pdf> - A great report on wood energy opportunities in Maine

<http://northquabbinforestry.com/2010/12/14/forest-biomass-markets-promote-great-forestry/> - my own analysis way back in 2010!

<https://www.google.com/#q=Carbon+Emissions+Accounting+%26+Manomet+Carbon+Policy+Study+Review+Jay+O%27Laughlin> - The first peer reviewed research paper to expose the fraudulent Manomet Biomass “Study”.

<http://phys.org/news/2015-11-export-wood-pellets-eu-environmentally.html> New study from the University of Illinois shows that the greenhouse gas intensity of exporting wood pellets to Europe to generate electricity there is up to 85% lower than that of coal-based electricity. So, when we use biomass here, the carbon benefits are even greater!

<http://www.stateforesters.org/current-issues-and-policy/other-priorities/biomass-and-renewable-energy> - National Association of State Foresters support biomass

<https://vnrc.org/wp-content/uploads/2019/09/Vermont-Forests-and-Our-Energy-Future.pdf> - Vermont Natural Resource Council and the National Wildlife Federation say Vermont can be a leader in the innovation, production and sustainable use of biomass energy from local wood.

<http://www.mass.gov/eea/docs/doer/renewables/biomass/bio-08-03-04-forest-ecol.pdf> According to this research, MA forests can sustain a biomass harvest of 900,000 dry tons/year, which is equivalent to 1,800,000 green tons or enough to fuel 137 megawatts of biomass power. In addition, waste wood from tree trimmings, land clearing, ROW maintenance, etc. could fuel at least another 100 MW of biomass power.

There are about 400,000 acres of private forest land enrolled in the Ch.61 Forest Land Tax Program and/or Forest Stewardship Program. Harvesting an average of 30 tons/acre of biomass on 20,000 acres would produce 600,000 tons. A cutting cycle of 15 years could produce 300,000-600,000 tons/year. Another one million acres of private forest land could easily produce an additional 750,000 – 1,500,000 tons.

[https://northernwoodlands.org/editors\\_blog/article/wood-and-carbon-debt](https://northernwoodlands.org/editors_blog/article/wood-and-carbon-debt) At a Mohawk Trail Woodlands Partnership meeting, UMass researcher Paul Catanzaro presented results of a study he did with Anthony Amato from UVM on the Impact of Forest Management on Carbon. By reviewing Forest Cutting permits in Massachusetts, they found that most harvesting here is partial cutting, removing about 4Mbf/acre or about 13 metric tons of carbon/acre, cutting roughly 1/3 of the trees at a time. A typical harvest reduces the net carbon storage/acre by about 17 percent, 10 metric tons/acre from the harvested timber, and another 3 tons from disturbing the duff. Below surface carbon appears not to change much if BMPs are followed to protect soils from erosion. By their calculations, the carbon removed in partial harvesting is replaced by new growth primarily of existing trees in about 9 years (at a rate of 1.5 metric/tons per acre per year). A shelterwood harvest that cuts 2/3s of the net volume would reduce total stored carbon by about 30 percent and would take about 15 years to replace the stored carbon.

This contrasts sharply with the 60 to 100 year carbon replacement scenario cited by some anti-forestry extremists. That scenario seemed to be based on the idea that if you

cut down a sizable tree, it will take 60 to 100 years for an equal sized tree to grow to replace it. While that might be true for an isolated tree in the open, it doesn't reflect actual forest growth. With the partial cutting common here, the trees uncut use the increased sunlight to grow faster and replace carbon much faster. Added growth absorbs more carbon than new trees would initially.

Another carbon study was done recently by Mass Wildlife on clearcuts they did to create early successional habitats for wildlife. The study reportedly that net carbon on the clearcuts was within 2 percent of the total before harvesting after just 6 years of regrowth. From [https://masswoods.org/sites/masswoods.org/files/Forest-Carbon-web\\_1.pdf](https://masswoods.org/sites/masswoods.org/files/Forest-Carbon-web_1.pdf)

“Forest conversion and timber harvesting are not the only ways in which forests lose carbon. One of the anticipated impacts of climate change is more frequent and more severe natural disturbances, such as wind and ice storms. In addition, invasive insects and plants and deer overpopulation pose an increasing threat to our forests. Opportunities exist to use active forest management to make our forests more resilient to these disturbances by increasing species and structural diversity. Forests with diverse species and structure increase forest resiliency by reducing the risk that a disturbance will kill all the trees in a forest because the trees are all the same species or a similar size. In addition, forests with these diverse conditions contain multiple mechanisms for recovery following such events, which will allow for carbon levels to return to pre-disturbance levels more quickly. Resilient forests can help avoid a potentially large loss of carbon in the future due to a single disturbance (hurricane, invasive insect) and ensure a steady flow of other forest benefits. **Though active forest management would temporarily reduce the amount of carbon stored in the forest, it may help prevent an even larger reduction in carbon storage by avoiding losses due to a large-scale disturbance** (D’Amato et al. 2011; Bradford et al. 2013).”

Dr. Mark Ashton, Professor of Silviculture and Forest Ecology at the Yale School of the Environment has stated **“Developing resilient forest landscapes is more important than focusing on carbon sequestration”**. He has stressed the **“importance of all levels of diversity in a climate resilient forest.”**

UMass Forestry Professor Matt Kelty: **“Promote mixed-species, mixed-age stands. —These stands tend to have higher carbon uptake and storage because of their higher leaf area. Furthermore, mixed stands include species that are both shade tolerant and intolerant so that there are trees that grow successfully at all levels; this leads to maximum increase in biomass, which enables more carbon sequestration. Finally, mixed stands enable forests to withstand outbreaks of disease and insect infestation so that even if one type of tree succumbs to disease, the other species of trees are able to survive and to continue to sequester carbon. Therefore, landowners should follow these recommendations in order to sequester the maximum amount of carbon in forests.”**

Thus my (North Quabbin Forestry) biomass improvement cuttings, which typically remove 1/3 of the basal area, re-sequester the carbon that was harvested or lost in just nine years. Further, by replacing imported fossil fuel with locally produced wood pellets,

emissions are further reduced while it has tremendous economic benefits as well as forestry and wildlife benefits!

## **V. Massachusetts Forestry Laws:**

The Chapter 132 Forest Cutting Law states in part that “the public welfare requires the rehabilitation, maintenance, and protection of forest lands for the purpose of conserving water, preventing floods and soil erosion, improving conditions for wildlife and recreation, and protecting air and water quality, and providing a continuing and increasing supply of forest products...” But DCR approved liquidation cuttings defeat all of these noble purposes! Liquidation cutting is also a violation of the “Global Warming Solutions Act” as poorly managed forests sequester much less CO<sub>2</sub> than well managed forests.

The Forester Licensing Law states that “Licensed Foresters shall advocate and practice land management consistent with ecologically sound principles”. However, DCR continues to approve Forest Cutting Plans filed by Licensed Foresters which call for destructive liquidation cuttings. This is illegal. It’s equivalent allowing a doctor to deliberately engage in malpractice!

The Forester Licensing Law also says that “the purpose is to protect forest landowners by requiring that individuals offering professional forestry services meet minimum requirements of education and experience.” But DCR insults us Licensed Foresters by allowing anyone to pretend they practice forestry as long as they don’t call themselves a forester! But every other licensed professional that are in the Division of Professional Licensure are protected against this devaluation and fraud of their profession. If you try and pretend to practice any of those other professions, you are subject to prosecution and severe penalties. This is because Licensed Foresters are for some strange reason licensed by DCR and not in the DPL.

## **VI. Promote Forestry by eliminating or reducing marginal or failed forestry programs:**

Over the past few decades, there have been efforts to support forestry all of which failed:

1. In the 90’s the state subsidized a log concentration yard in Greenfield. The idea was if you trucked a lot of low grade sawlogs to one location it would make them more attractive to a log buyer. Well that didn’t work and the yard went belly up.
2. In the latter part of the 90’s, the state created the “Forest & Wood Products Institute” at MWCC. It was supposed to promote forestry but instead just supported itself. After wasting a few million, the state pulled the plug.

3. There was the “North Quabbin Woods Project” which was supposed to promote forestry but never did. Instead they sold wooden knick-knacks in a little storefront in Orange. They also went belly up and a few million dollars were wasted there too.
4. There was the Massachusetts Woodlands Cooperative where landowners hoped to sell their junk wood in bulk to get a better price. They even built their own sawmill which produced the most expensive boards in the country! But they went belly up too because they couldn’t make the economics work. Millions of taxpayer dollars were wasted with that boondoggle.
5. The Mohawk Trail Woodlands Partnership was originally meant to support forestry by supporting the construction of a wood pellet plant but that proposal was deleted when a small group of anti-forestry protesters complained. So, you can buy wood pellets in this area and you can use them in your wood pellet stove but we cannot manufacture them here! How does that make sense? Wood banks provide poor people with firewood so they don’t freeze in winter. There were no protests against the wood banks so why were there protests against the manufacture of much cleaner burning wood pellets? Thus, the “Partnership” will waste millions of dollars on more bureaucrats and wasteful projects.
6. Green Certification – The idea behind this program was that landowners would be paid more for their timber if their woodlot was “green certified” by an expensive certification. Well as a consulting forester, I certify my landowner clients’ woodlots in the Chapter 61 Forest Land Tax Program. Then the state MA DCR Service Forester “recertifies” when he or she approves the plan. So why would we need certification in triplicate from an expensive 3<sup>rd</sup> party “certifier”?! Besides, very few people are going to pay more for “certified” lumber than non-certified lumber so landowners will see no increase in their stumpage values. Therefore, the program is useless.
7. Carbon Trading – This is another bureaucratic boondoggle whose main beneficiaries will be the “carbon traders” who will skim off a fortune while landowners will get a minor token. The last program offered landowners a laughable \$8/acre and that’s only after they had an expensive “carbon” management plan done.

### **Highlights for the Act for a New Forestry Deal for Massachusetts Forest Landowners**

#### **I. Reforming the Chapter 61/61A Forest & Farm Land Tax Programs to Encourage Enrollment:**

1. Repeal the “Right of First Refusal” when landowners withdraw from the programs which no other state in the country has and scares away many landowners from enrolling. In addition, eliminate the conveyance tax for early withdrawal and reduce the rollback tax to two years if landowners withdraw from the program.
2. Reduce the tax on all acreage that is enrolled in the program to zero. Residential development costs towns money because more town services are needed to support new development whereas enrolled forest land cost towns almost nothing.
3. Reduce the minimum forest acreage for the Chapter 61 Forest Land Tax Program to five acres as it is in the Chapter 61A Farm Land Tax Program.
4. Provide \$2 million/year to the Working Forest Initiative for new Chapter 61/Forest Stewardship Plans.
5. All landowners enrolled in the Chapter 61 Forest Land Tax Program will automatically obtain Green Certification without any additional expensive paper work. This certification would be similar to SFI (Sustainable Forestry Initiative), FSC (Forest Stewardship Council) or Tree Farm Certification and be called Massachusetts Sustainable Forestry (MSF).
6. Provide forest landowners an annual tax credit of \$100/acre/year for all acreage that is enrolled in the Chapter 61/61A Forest & Farm Land Tax Programs which would provide some compensation to landowners for all the ecosystem benefits they provide to the Commonwealth such as clean air, clean water, wildlife habitat, and CO<sub>2</sub> sequestration which is estimated to be \$1,000/acre/year or more.
7. Provide for an enhanced Chapter 61 to make it easy for landowners to permanently protect their forests in a Conservation Easement. Licensed Foresters would help



landowners do this by using an easy one-page form which would be recorded at the Registry of Deeds. This would greatly reduce the very high costs associated with Land Trusts saving landowners millions of dollars in unnecessary costs and encourage more landowners to permanently protect their forest land. Landowners would be paid fair market value for their Conservation Easements with funds to support the program coming from the Environmental/Climate Bond Bill and any future Environmental/Climate Bond Bill.

8. Less than 20% of all private forest land in Massachusetts is enrolled in the Chapter 61 Forest Land Tax Program in contrast to NH which has a 60% enrollment rate in their Current Use Program. The goal should be to get at least ½ of all private forest land enrolled in this critical program.

## **II. Reforming the Chapter 132 Forest Cutting Law to Improve Forest Productivity:**

1. All Forest Cutting Plans will be for Long Term Forest Management. The “Short-term Harvest” (also known as destructive high-grade logging) will be eliminated. The method to determine if a Forest Cutting Plan is for Long-term Forest Management will be the same as it is in the Chapter 132 Guidance Document: “Appendix B: Procedure for Long-Term Management Determination/Short-Term Harvest Determination”.

2. All towns will adhere to a new state rule called “A Right to Practice Forestry” with an approved Forest Cutting Plan. This will supersede all local bylaws concerning forestry and will be identical to “Right to Farm” bylaws. This will mean that no local Zoning By-Law may prohibit, unreasonably regulate, or require a special permit for the use of forest land for the primary purpose of forestry. All local wetlands bylaws will be superseded with an approved Forest Cutting Plan because the practice of silviculture and forest management will be an allowed use.

3. All mitigation requirements mandated by the Natural Heritage Program will be eliminated with an approved Forest Cutting Plan. Instead, voluntary measures will be

suggested with the approved Forest Cutting Plan as it is in other states. This will make it much easier for landowners to manage their forest land which has been arbitrarily designated as rare species habitat often without any evidence. Maintaining land as forest provides the best protection for wildlife habitats.

4. Eliminate the “Foresters for the Birds” Program. All forestry will be accepted as being good for birds and all other wildlife populations.

### **III. Reforming the Massachusetts Forester Licensing Law:**

1. Forester Licensing will be moved out of DCR and put in the Division of Professional Licensure with all the other licensed professionals. This will allow Licensed Foresters to have the same protections as do other Licensed Professionals and it will also allow for greater consumer protection for landowners. This move will also eliminate DCR’s Forester Licensing Board.
2. A Massachusetts Forester’s License will be good for three years instead of one. The CFE (Continuing Forestry Education) credits needed for renewal will be reduced from 20 credits/year down to 10 credits/year. This compares with MA Licensed Timber Harvesters who only need 3 credits/year to maintain their licenses.
3. Encourage the creation of a New England Forester’s License by accepting the licenses of foresters from other states if they accept ours.

### **IV. Improving DCR’s Forestry Operations for Massachusetts Landowners:**

1. All Chapter 61 Forest Management Plans and Forest Stewardship Plans will automatically be approved and registered by a DCR Forestry Clerk upon receipt when filed by a Massachusetts Licensed Forester. Reviews of Forest Management/Forest Stewardship Plans by DCR Service Foresters will be eliminated. Forest Cutting Plans will continue to be reviewed by the DCR Service Foresters and all Forest Cutting Plans must fall within the Recommended Management Practices in the Forest

Management/Forest Stewardship Plans unless the Management Plans are amended.

Once Forester Licensing is moved to the Division of Professional Licensure, Licensed Foresters will stamp their Forest Management Plans and Forest Cutting Plans and the state will accept it like they do for engineers and surveyors.

2. All Forest Cutting Plans will be checked for complete information only and approved/disapproved by DCR Service Foresters within 10 working days as it is now. DCR Service Foresters will do everything they can to facilitate the approval of all Forest Cutting Plans by notifying the applicants for corrections before disapproving.
3. When private landowners call DCR inquiring about forestry services they will be referred to the MA Directory of Licensed Foresters.

#### **V. Encourage the Development of Forest Industry in Massachusetts:**

1. All Combined Heat & Power Biomass Energy facilities will be added to the list of qualified renewable energy facilities in the Renewable Portfolio Standard (RPS) Class I category and be eligible for full Renewable Energy Certificates (RECs). The efficiency requirement will be reduced to 40% for a full REC credit. This will encourage more locally produced biomass energy with some of the waste heat used to manufacture wood pellets to reduce our use of imported heating oil and for greenhouses and other food crop production. All existing stand-alone biomass electric power plants will be grandfathered in and be eligible for ½ the value of a Renewable Energy Certificate.
2. The regulations governing biomass energy will be changed so that: all biomass derived from woodlots with an approved Forest Cutting Plan will be accepted as sustainable; there will no longer be any regulation for a volume of harvest residues that must be retained on a harvest site based on soil productivity since it has been determined that enough coarse woody debris is being retained on all harvests; the requirement that all woody biomass units achieve a 50 percent reduction in greenhouse gas emissions over 20 years as compared to a combined-cycle natural gas unit will be accepted as being met by

any and all biomass plants as long as our forests are growing faster than they are being cut; eliminate the electronic certificate registry to track and verify eligible biomass fuel supplies which also differentiates between wood derived from residues and forest thinnings; change the minimum operating efficiency of 50 percent to receive one half of a renewable energy credit (REC) to 25% for existing plants and 40 percent to receive a full renewable energy credit (REC). Eliminate the requirement for a Forest Impact Assessment every five years to review program implementation and any impacts on forests and markets as well as an Advisory Panel to review tracking and enforcement mechanisms. Instead, rely on the US Forest Service annual forest inventory report for Massachusetts.

3. All forest biomass that is derived from a DCR approved Forest Cutting Plan will be accepted as being carbon neutral.

4. Provide a 30% investment tax credit for at least six regional CHP plants and at least two wood pellet plants across the state. Increase rebates for all wood pellet heating systems for businesses, homeowners, and public buildings and restore the wood stove change-out program.

5. Provide price supports to establish a floor of \$30/ton for all chipwood produced from woodlots which have a DCR approved Forest Cutting Plan. It would be capped at \$20 million/year. This would increase annually by the rate of inflation. The subsidy would be funded by proceeds from RGGI Auctions (See VI. - 3) and paid to buyers of chipwood.

6. Encourage the use of regionally produced Cross Laminated Timber (CLT) in new construction especially public buildings by providing a sales tax exemption for all CLT that is used in any new construction project.

7. Encourage the use of other wood using industries in Massachusetts by providing a 30% investment tax credit of a project's cost.

8. Provide a Job Tax Credit of \$5,000 for every new job created in forestry and forest products industries that are located in Massachusetts.

## **VI. Improve Forest Health and Forest Productivity:**

1. Non-native insect infestations such as the gypsy moth caterpillar, the hemlock wooly adelgid, the emerald ash borer, the Asian longhorned beetle, and other insect pests will be monitored and control measures encouraged. Aerial spraying of organic BT will be done for the control of the gypsy moth caterpillar as needed.
2. Enact a comprehensive program to control non-native invasive plants which are a huge threat to our forest ecosystems. Require that all cities and towns develop an invasive plant control program that would include all town roads and town owned property including schools, recreation areas, parks, and conservation land. Contact all landowners to educate them on the need to control invasive plants and practice good forestry. Invasive Control Management Plans will be paid for by an increase in local aid and Plans for all cities and towns will be reviewed and approved by DCR's Director of Forest Stewardship.
3. The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by Northeast and Mid-Atlantic States to reduce CO<sub>2</sub> emissions from large fossil fuel power plants. MA receives about \$50 million/year from RGGI Auctions. The proceeds from the auctions go to energy efficiency and other projects but nothing goes to forestry. So the New Forestry Deal is calling for 50% of all auction revenue go to forestry. The RGGI has a "forestry protocol" but it has done nothing to help forestry in Massachusetts

**VII. Mandate a no net loss of forest land from the construction of all solar farms.** All new solar farms will be confined to landfills and other brownfields.

**VIII. Conclusion:** Encouraging the protection and management of private forest land is critical to sustain our environment for future generations in Massachusetts and sequester up to 20% of our greenhouse gas emissions making it easier to reach net zero by 2050. The goal of increasing the total amount of protected forest land in Massachusetts from one million acres to 2.5 million acres which is an area equal to ½

of the state's land area can only be achieved by passing "A New Forestry Deal for Massachusetts Landowners".

### **Benefits of the New Forestry Deal for Massachusetts Landowners:**

1. Protecting clean air and water. Catastrophic storms and other agents can disturb a significant portion of the forest, changing species composition and age distributions suddenly. These events can increase erosion and sedimentation which can reduce water quality. A forest that is diverse in age structure limits the impacts of these disturbances. A forest that is also high in species diversity is less susceptible to severe mortality than a single species forest when insect pests or tree diseases attack.
2. Enhancing wildlife habitat for declining bird and other wildlife populations. Many types of wildlife rely on young forest habitats which are declining in Massachusetts.
3. Increasing locally produced forest products and clean renewable biomass energy.
4. Restore the health and productivity of private forest land that has been greatly diminished due to state sanctioned highgrade logging, insect infestations, tree diseases, storm damage, and non-native invasive plants.
5. Managed forests sequester more carbon annually than unmanaged forests. Managed forests are also more resilient to climate change because healthier trees are retained and growth rates are improved. Leaving forests alone will not increase CO2 sequestration rates. In fact, leaving them alone will DECREASE those rates because the threats to our forests are growing in Massachusetts.

### **Information, Research Papers & Studies on Forestry, Biomass, and Forest Industry**

1. Large Biomass Markets in or near Massachusetts: New England Wood Pellet in Jaffrey, NH has a capacity to produce 84,000 tons of wood pellets from about 150,000 tons of mostly green wood and is the only significant thermal market near MA. Pinetree Power uses about 200,000 tons of wood chips/year and is the only significant market in Massachusetts.
2. <https://www.frcog.org/wp-content/uploads/2016/02/Mohawk-Trail-Woodlands-Partnership-FINAL-PLAN.pdf> - Mohawk Trail Woodlands Partnership 2014-2015 - A Plan for Forest-Based Economic Development and Conservation – This report was funded by the Franklin Regional Council of Governments, Berkshire Regional Planning Commission, Franklin Land Trust, and the Executive Office of

Energy & Environmental Affairs. This study promoted increasing the use of sustainable forestry practices and supported renewable wood heat for public buildings and private homes and businesses in the 20-town area of NW MA. It included support for a new wood pellet plant in western MA. **It was estimated that with development support, the wood central heating market could reduce GHG emissions by 500,000 tons and create over 2,000 jobs in Massachusetts by 2020. There was wide support for this as it would have reduced the use of imported heating oil, created lots of local jobs, and greatly reduce greenhouse gas emissions.**

After that report, DOER commissioned this outstanding feasibility study to support a wood pellet plant in 2016 (which DOER later buried for unknown reasons!): <https://www.inrslc.com/Mohawk.Resource.Assess.INRS.v2.pdf>

The above study was done to assess the forest resource and gain an understanding of the low grade wood resources that could be used for wood pellet manufacturing and production of semi-refined wood chips in the northwestern Massachusetts 20 town region. There are 420,000 acres of timber land and forest growth exceeds removals by a factor of 8 to 1. Sustainable forestry is defined as cutting no more than the annual growth. According to that study, 65% of the standing bolewood volume in that 20-town area is low grade timber!

Wood pellet plants range in size from 20,000 tons to 100,000 tons/year which translates to 40,000 tons – 200,000 tons of chipwood. It takes two tons of chipwood to manufacture one ton of pellets. On the very conservative side, 193,000 tons/year could be harvested for the production of wood pellets. 429,000 tons on the more realistic side increasing to 700,000 tons by the year 2035. But that is just in NW MA. We could easily harvest 2 million tons/year on a sustainable basis.

3. North Quabbin Forestry Study:

One 50 MW power plant will use between 550,000 and 650,000 tons of green wood per year using an 80-90% operation capacity, Biomass electric produces benefits that wind and solar do not. Biomass electric produces a market for low grade timber. Pinetree Power, for example, provides a market to improve anywhere from 5,000 – 8,000 acres of forest land/year. It would cost anywhere between \$500/acre to \$2,000/acre to improve forest land in a similar fashion as a whole tree chip operation without a biomass market. So Pinetree Power adds between \$2,500,000 – \$16,000,000 of forest improvement value every year or about a \$9 million average every year. In addition, after a biomass improvement cutting timber grows at a higher rate adding hundreds of thousands of dollars' worth of forest value growth every year. Property values are also greatly increased after a biomass improvement cutting because everybody likes to walk through a well-managed forest rather than an unmanaged forest or one that has suffered a destructive highgrade cutting. Finally, biomass markets encourage landowners to keep their land in forest rather than develop them.

## VII. Biomass Thermal:

In Massachusetts, 80% of all households heat with fossil fuels (natural gas or oil) while 14% heat with electricity generated mostly from fossil fuels and nuclear power while only 1.4% heat with wood and a tiny .04% use solar. Wood is the most successful residential renewable energy technology in America today. The average home with an oil burner uses 700-800 gallons of fuel oil/year. Switching from oil heat to wood pellet heat reduces carbon emissions by 90% and can also save up to 50% in heating costs. Mount Wachusett Community College, Athol High School, Cooley Dickinson Hospital, the Quabbin Reservoir Administration Building, and Harvard Forest as well as many homes and businesses have biomass energy systems saving millions of dollars every year and greatly reducing emissions. The country of Sweden used to obtain 90% of their heating by using imported oil but now 90% of their heating needs are obtained by using their own wood pellets. We can do the same. New EPA approved pellet boilers are super-clean and reduce your carbon footprint three times more than adding solar panels. [http://www.forgreenheat.org/issues/promoting\\_clean\\_technology.html](http://www.forgreenheat.org/issues/promoting_clean_technology.html) - Wood heating technology has come a long way and has the lowest amount of greenhouse gas emissions among home heating fuels.

1. <http://www.forgreenheat.org/incentives/states/vermont.html> Vermont supports wood heat. Vermont's comprehensive energy strategy has set a goal of achieving 35 percent of all thermal energy used in the state from biomass by 2030. In Vermont today, nearly 40 percent of K-12 students are heated by a wood-based system.
2. [http://www.forgreenheat.org/incentives/states/new\\_hampshire.html](http://www.forgreenheat.org/incentives/states/new_hampshire.html) NH supports wood heat.
3. <http://www.forgreenheat.org/incentives/states/maine.html> Maine supports wood heat
4. [http://www.forgreenheat.org/issues/promoting\\_clean\\_technology.html](http://www.forgreenheat.org/issues/promoting_clean_technology.html) Wood heating technology has come a long way and has the lowest amount of greenhouse gas emissions among home heating fuels.
5. <https://vermontbiz.com/news/2018/december/06/wood-vermont's-locally-grown-renewable-fuel> "Low grade wood becomes firewood, woodchips or, historically in our region, paper. However, the paper industry has been collapsing in recent years leaving a gap in the market for this low grade wood. It is absolutely essential to have healthy markets for both high and low grade wood - without the pair it is impossible to carry out a sustainable forest management plan." Thus, an expanding market for wood pellets is simply replacing some of the demand that has been lost with the closing of numerous paper mills.
6. SO<sub>2</sub> Emissions – Wood pellets produce no SO<sub>2</sub> emissions. Oil produces a lot – 94 g/MJ. SO<sub>2</sub> helps to produce acid rain which damages our forest and wetland ecosystems. Thus, wood pellets are much better for the environment.



7. Health Impacts: - Particulate Emissions from Residential Heating Systems - Wood pellets burn more cleanly compared to burning conventional cordwood used in fireplaces and wood stoves. Pellets create a minimal amount of smoke during operation. A modern pellet boiler is 140 times cleaner than that old wood stove. There's not much difference in particulate emissions between oil, propane, and a wood pellet boiler. The speculation that biomass energy increases asthma rates because of the tiny amount of additional particulate emissions is false. Modern biomass plants – both electric and thermal – are very efficient, clean burning, and well within strict EPA standards. In addition, a peer reviewed study by the prestigious John Hopkins Hospital concluded that it is indoor air pollution (second hand smoke, mice, rats, cockroaches, poor ventilation, etc.) that is the main cause of higher asthma rates.
8. Economics of Wood Pellets: <http://www.woodheatmaine.org/wp-content/uploads/2018/10/ME-SWEAT-Economic-Impact-Summary-FINAL.pdf> - A study of 106 commercial, industrial, and institutional buildings in Maine that switched to wood heat - \$20.6 million in total economic benefit. <http://biomassmagazine.com/articles/16027/report-maine-can-benefit-by-encouraging-switch-to-pellet-heat> If 15 percent of the homes and businesses in Maine that currently use heating oil change to pellet heat over the next decade, Strauss said it would keep an additional \$133 million circulating in the state's economy and result in approximately 8,000 new jobs being created. Additional economic benefits in the form of increase household disposable income would also result due to the lower cost of wood pellets relative to heating oil. Strauss estimates that a typical home in Maine would save \$500 per year in heating costs by switching from heating oil to pellets. Economic benefits would also result from the construction and operation of new pellet production plants, along with the establishment of pellet distribution operations. Overall, Strauss estimates that if 15 percent of current heating oil users would switch to wood pellets, the state would see an increase in income tax revenues of about \$22.9 million per year. According to the paper, the net annual estimated increase in state and local tax income would be about \$27.7 million. Not accounting for inflation, the paper estimates an additional \$280 million would be accrued by the Maine treasury. over a 10-year period.
9. <http://economics.mit.edu/files/7337> - This study by MIT shows it costs up to \$600 to displace one ton of carbon using solar while it only cost as little as \$10/ton to displace one ton of carbon when using wood pellets instead of fuel oil. Thus, wood pellets are more than 50X as cost effective as solar! Why are we subsidizing made in China solar anyway?!

10. Harvard Forest Massachusetts Timber Harvesting Study:  
<http://harvardforest.fas.harvard.edu:8080/exist/apps/datasets/showData.html?id=hf080>

“The predominant form of harvesting was selective removal of commercially valuable tree sizes, grades, and species (e.g., red oak and white pine). Removals of red oak sawtimber exceeded those of red maple by more than a factor of 4, in spite of the fact that red maple stem density is more than 4 times that of red oak and red maple sawtimber exceeds red oak by 8%. There is potential for a shift in regional species composition, as harvest preferentially focuses on red oak and white pine and generates conditions that favor red maple. This regime of chronic disturbance is occurring over the entire landscape and exerting a major influence on forest composition, dynamics, and habitat quality. The pattern and intensity of harvesting has major ecological implications”.

**Harvard Forest could not bring itself to call it by its rightful name but we practicing foresters call that destructive highgrade logging.**

A webinar on highgrading said this: Stratified second growth hardwood forests develop naturally over time. Oak on top, red maple, beech, and hemlock on bottom. Cutting the dominant and codominant trees (oak) greatly reduces overall growth. The trees in the lower crown classes (intermediate & suppressed) don't grow well. After a second highgrade, the forest is finished commercially. Highgrading leaves a degraded forest of slower growing species. Degraded stands don't recover as there is decreased growth from poorly stocked residual trees. In southern New England, ½ of our forest is poorly stocked or at risk of being poorly stocked. The most common cause of poorly stocked stands is highgrading. Highgrading also: Reduces seed source of more desirable species such as oak; Reduces wildlife habitat by reducing mast trees; Is genetically degrading to the forest overall; Promotes less species diversity; Creates a patchy unsightly forest; Is an inefficient use of growing space; The residual stand is of much lower vigor; Loss of long term sustainability; Reduction in yields- 52 board feet/acre/year. As much as 1,500,000 acres in MA (about ½ the forest) has been highgraded which means we are losing as much as 78,000,000 board feet of potential growth every year! That is much more than we are harvesting! In addition, tree mortality caused by overcrowding, insects (HWA, etc.) and disease are also greatly reducing potential yields. Good silviculture produces twice as much revenue over the long term versus highgrading. See also <http://northquabbinforestry.com/liquidation-cutting/> - A comprehensive examination of destructive highgrade logging.

**This is the biggest failure by the Massachusetts forest bureaucracy. They have clearly ignored the intent of the Forest Cutting Practices Act many decades after its enactment. The results have been devastating for the forests of Massachusetts.**

11. [http://harvardforest.fas.harvard.edu/sites/harvardforest.fas.harvard.edu/files/publications/pdfs/Berlik\\_JBiogeography\\_2002.pdf](http://harvardforest.fas.harvard.edu/sites/harvardforest.fas.harvard.edu/files/publications/pdfs/Berlik_JBiogeography_2002.pdf) In this paper by Harvard Forest entitled “The Illusion of Preservation”, the authors argue correctly that when we lock up or stop the management of our own forest lands, then we import more wood often from areas that don't have our high environmental standards. Thus, forest degradation and carbon emissions are simply exported. Hence, the “illusion”.

12. <https://www.massaudubon.org/our-conservation-work/advocacy/shaping-the-future-of-your-community/publications-community-resources/losing-ground> - Mass Audubon's latest study shows the pace of development in MA. Mass Audubon calls for permanent conservation of 50% of all land in Massachusetts by 2050 but like Harvard Forest, they have no realistic plan to achieve that lofty goal. But we do with the "New Forestry Deal for Massachusetts Forest Landowners"!

13. Massachusetts Climate Policy for our forests:

<http://resilientma.org/sectors/forestry> - **"Climate Change Clearinghouse for the Commonwealth"**

Under Management Practices:

- Increase forest diversity (species, structure, age classes and habitats) and vigor via professional forest management
- Encourage active forest management for renewable wood products and wildlife benefits and promote local wood products to keep working forest landscapes economically viable
- Permanently conserve the most intact, productive and resilient forest ecosystems
- Expand invasive species management with programs to reach private and public landowners

**So what is the state's plan to implement the "Climate Policy for our Forests"? The state has no plan.**

#### **4. Conclusion:**

1. Private forest land is critical to help provide clean air, clean water, wildlife habitat, and the forest products that we all use. By helping landowners protect and manage their forest land, we will ensure a better environment for future generations.
2. In order to maintain and/or increase our forests ability to sequester CO<sub>2</sub> to help mitigate climate change, then they must be actively managed. However, there is an upper limit to a forest's ability to sequester CO<sub>2</sub> while insects, disease, and windstorms periodically reduce the amount of CO<sub>2</sub> sequestered. Thus, the CO<sub>2</sub> "bank" is constantly fluctuating. Leaving forests alone will not increase CO<sub>2</sub> sequestration rates. On the contrary, with the spread of non-native insects and the awful legacy of state-sanctioned destructive highgrade logging, the CO<sub>2</sub> sequestration rates are much lower than they could be. More importantly, forests must also be managed for forest products to help provide the wood we need and to enhance wildlife habitat. Managed forests sequester more CO<sub>2</sub> annually than unmanaged forests. This is accomplished by: utilizing materials from thinnings for energy to offset fossil fuel consumption; long term storage of carbon in durable wood products from harvested wood; increasing growth rates of the higher value

trees; and successfully regenerating the harvested forest to meet or exceed previous sequestration rates. Therefore, increasing the acreage under actual forest management will enhance CO2 storage for our forests. Managed forests are also less apt to be developed rather than unmanaged forests so CO2 continues to be sequestered in those managed forests rather than being lost when the forest is developed. If you want to see great forestry, then you must support more biomass markets because without low grade markets, great forestry is impossible.

3. The MA Global Warming Solutions Act mandates steady reductions of greenhouse gas emissions. Forests are the major landscape feature in MA covering 60% of our land area and are a significant sink for CO2 emissions. Thus, our forests can play a major role in achieving the mandated goals as long as consulting foresters have the ability to practice superior silviculture for our landowner clients.
4. We should ensure that public investments prioritize the lowest cost, lowest carbon options to combat and cope with our changing climate. The lowest cost investment, by far, is promoting good forestry, protecting forests from development, and supporting clean renewable biomass energy. **Promoting good forestry is the least expensive way. The “New Forestry Deal for Massachusetts Forest Landowners” will rebuild our forest economy and create thousands of new jobs in forest industry while improving our forests. It will be a win-win for everybody. Let’s improve our forests and put our people back to work!**

**Support HD.1450, An Act for a New Forestry Deal for Massachusetts Forest Landowners** - <https://malegislature.gov/Bills/192/HD1450>

# Comments on Interim 2030 CECP

## 1. Overview

### Authors

- **Tony Rogers** – Pelham, MA. Retired wind and solar engineer; technical author of the state’s winning grant proposal for the Charlestown Wind Technology Testing Center; co-author of graduate textbook on wind energy engineering. [tonyrogersemail@comcast.net](mailto:tonyrogersemail@comcast.net)
- **Chris Riddle** – Amherst, MA. Chris Riddle, Principal Emeritus, Kuhn Riddle Architects (KRA), AIA, LEED AP. Specialist in high-performance buildings with a minimum impact on the natural environment.
- **Sherry Morgan** - A South Deerfield resident, is retired from a 26-year career with the U.S. Fish and Wildlife Service where she worked on wetlands, endangered species and migratory birds.
- **Jeff Clark** - Amherst, MA. Retired as a Principal Analyst at Forrester Research to devote his energy to developing policies that address climate change, working with groups such as Citizens Climate Lobby, Climate Xchange and the ZEV Coalition.
- **Ed Olmstead** - Florence, MA. Hampshire College Alumni continuing to promote innovation in learning and in the world.
- **Barbara Tinker** - Amherst, MA. Retired clinical psychologist. Over 15 years working on international environmental educational projects sponsored by the NSF. The projects stressed atmospheric, land and climate measurements, data sharing and analysis, with data from at least 20 countries.

### The Interim 2030 CECP is a serious effort to address climate emissions

Overall, we appreciate the administration's serious effort to address the state's climate emissions, the thoroughness of the 2050 Roadmap analysis as a basis for policy development, and the administration’s thoughtful efforts to translate a Roadmap of required technical transitions into policies that will result in those desired outcomes. Nevertheless, we see a number of areas in which the draft Clean Energy and Climate Plan needs to be strengthened. It is those areas that we address here.

### Organization of this document

**Section 2** provides an overview of concerns that we have about: the aggressiveness of the emissions reduction targets and the need for a risk management approach in choosing strategy options. This 2-page discussion provides background for our proposals for strengthening the strategies proposed in the Interim 2030 CECP.

**Section 3** includes a new proposed policy area in which policies are needed: Risk Management. These proposed risk management policies focus on the need for up-to-date insight into the state’s emissions, risks related to the effectiveness of policies, policy review and updating intervals, and measures to ensure that EEA can nimbly address policy deficiencies and prepare the state for future technology needs.

**Section 4** includes policy proposals for each of the EEA policy areas used in the Interim 2030 CECP (such as “Transforming our Transportation System”). Proposals for changes or additions to specific strategies are included under each relevant EEA strategy (such as under “Strategy T3: Reduce Upfront ZEV Purchase Cost Burden”).

**Section 5** includes proposals in another new policy area: Public Accountability. The state’s emissions reduction goals will initiate a period of great change that will affect all of the state’s residents. Section 5 includes strategies

to ensure that everyone in the commonwealth is engaged in this process, has answers to their questions, and that we have the political will to follow through on an aggressive agenda that will ultimately yield tremendous benefits.

## Format of Strategy Proposals

For easy later reference, our suggestions for new or augmented strategies are in **red-brown font**. Each strategy suggestion is organized with the same general structure:

### 1. Title

- **Purpose:** (for example: Risk mitigation or Clarification of deadline for action).
- **Policy details** – (should they be important or unclear from the policy title).
- **Why?** – (a brief explanation of the importance of this particular policy suggestion).

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## 2. Discussion of areas needing strengthening

### Shortcomings which need addressing

The proposed policies are, in many ways, excellent choices that are critical to making the transitions that the administration seeks to make reality. Nevertheless, there are a few shortcomings, some critical, that should be addressed. Below, we address our concerns about the emissions targets that guide the current policy, policies that address the serious risk of possibly not meeting our target emissions levels and policies that need strengthening.

### Emissions levels guiding policy

Of course, the emissions levels that are guiding policy development are anchored in the Governor's declarations that 1) our 2050 emissions should be at least 85% below 1990 levels and, in any case, net-zero and 2) that our target for 2030 should be 45% below 1990 emissions levels. To avoid burdening future residents with unachievable emissions reductions and to reflect current scientific consensus, our targets should be at least 50% below 1990 levels and 75% below 1990 levels in 2030 and 2040, respectively.

**The current targets risk increasing energy system costs dramatically over time.** The proposed straight line decrease in emissions will leave the commonwealth in a difficult situation as we approach 2050. Each decade the state will face reducing emissions levels by about 19 MMTCO<sub>2</sub>e. During the first decade, 2020-2030, those actions that are easiest and cheapest will have been chosen. There is significant risk of rapidly increasing net energy system costs as we leave the most difficult and expensive options for later. We must set up the commonwealth for success, not set the stage for challenges that cannot be reached.

**The current targets leave no room for error.** They are based on the 2050 Roadmap modelling exercise which assumes perfect knowledge of future technology costs, perfect knowledge of what is happening in other states and jurisdictions, perfect coordination with other states and jurisdictions, and perfect roll-outs of new technologies. None of these assumptions apply in the real world. Policy cannot be blindly based on direct inferences from the 2050 Roadmap. Such an approach almost guarantees failure to meet the state's goals.

**Greater initial reductions in emissions will set the state up for greater future success.** The most logical way to mitigate that risk of rapidly expanding energy costs is to reduce emissions such that the challenge we face each decade does not get more and more difficult. If emissions targets were set at 55%, 75% and 85% below 1990 emissions (in 2030, 2040 and 2050) then, over each upcoming decade, emissions would have to be reduced about 40% of then-existing levels. This will be challenging but less so than what we will face with the current plan in later years.

**Science calls for greater reduction in emissions levels than are currently being considered.** The IPCC has made it clear that if we are to have a livable planet, we will need to limit emissions to 50% of 1990 emissions levels by 2030.

### Risk mitigation

The plan proposed by the administration is aimed at achieving, as best as we can project, the target 2030 emissions reductions. The plan includes no mention of down-side risks, nor how to mitigate downside risks. There are many!

- **The state has no real-time measure of emissions.** Accounting of GHG emissions lags 2-3 years. When we are trying to change emissions by 20% of 1990 levels, over each 10-year period, having outdated information leaves us working in the dark.
- **Policy development efforts, when working with other independent entities, are uncertain.** Many new policies need to be implemented. Many of these involve players out of the control of the administration (citizens, industry, ISO-NE, the US government, FERC, other New England states), leaving policy development outcomes uncertain.
- **Policy development timelines hinder nimble policy adjustments.** Strengthening policy takes time. How long will it take to find out what impacts a policy has on numbers of EVs or heat pumps? How long will it take to implement corrective policies?
- **The effectiveness of policies, when implemented, will be uncertain.**
- **The risk of not achieving our emissions targets has serious negative consequences.** Our chosen 2030 target leaves little room for error. Missing the target makes the state's burdens much worse in later years.
- **Risk of weak political will is huge.** No entity has yet tackled all that needs to be done to address climate emissions. Maintaining political will to keep going will be critical. Losing public and legislative support will be disastrous.
- **Delay initiating action will set back our efforts to reduce emissions.** In most policy areas we are addressing polluting technologies that have long replacement intervals. Policies must be implemented as soon as possible.

**We need risk mitigation.** There are no downsides to overshooting our emissions reduction targets. In contrast, failure to achieve our targets will have a significant negative impact on reaching future targets. The state's plan needs to be strengthened to ensure a successful outcome - it needs risk mitigation. Possibilities include:

- **Aggressive timelines and clear benchmarks.** In many cases, the plan lacks solid benchmarks with which to measure success within the next decade to make sure that we might indeed achieve our 2030 goals. Certainly, the faster we can move forward, the lower the risk of failing to meet target emissions.
- **Aggressive policy targets.** Policies driven by a more aggressive 2030 target should be adopted as a strategy to make sure we achieve the state's official 2030 target.
- **Guardrails.** We need guardrails to ensure our desired outcomes if our adopted policies should prove to be inadequate. One possibility is a cap and invest approach with a linearly-decreasing cap on target fuels, one which corresponds to our desired emissions trajectory. This would automatically ensure the achievement of the 2030 target emissions. Fuel costs would only rise if policies were not achieving their objectives.
- **A basket of policies to address each emissions sector.** Multiple complementary policies either implemented simultaneously or ready to be implemented, if needed, would enable the state to more nimbly address changing conditions and new data.
- **Building for the future.** One additional way to mitigate the costs is to front-load support for the development of future technologies so they will be ready at scale and cost-effective when they are needed in later years. These technologies might include:
  - Expanded use of hydrogen for energy storage, transportation, electrical generation and industrial processes
  - Long-term build-anywhere grid-scale thermal or chemical energy storage
  - Zero-carbon and net-zero carbon fuels and technologies
  - Distributed energy technologies that provide flexibility to grid operation and control
  - Regional carbon capture and storage, including, for example, undersea sequestration



### 3. New Risk Management Policies

As mentioned above, there are serious down-side risks in the current plan. As proposed, all policies must be at least as effective as anticipated to achieve our goals. Policy failures may not be easily detectable until it is too late, and may not be easily corrected. To address these concerns, new Risk Management policies are proposed below.

#### **Policy R1: Establish a state-wide GHG emissions targets of no more than 50% below 1990 levels in 2030 and no more than 75% below 1990 levels in 2040.**

- **Purpose:** Help ensure that the state will actually be able to reach its goal by 2050.
- **Why?** Our chosen 2030 and 2040 targets leave little room for error. Missing our targets will make the state's burdens much worse in later years.

#### **Policy R2: Develop a method to determine GHG emissions within the most recent calendar year**

- **Purpose:** Policy guidance, risk mitigation.
- **Details:** The state needs to implement data collection systems and reporting requirements to enable the determination of reasonably accurate sector-wide GHG emissions. These estimates should be reported to state lawmakers and the public with any clarifying measures of uncertainty within 3 months of the end of each calendar year. This could involve using state databases (fuel tax receipts) or new requirements for reporting specific types of activities (fuel sales by type, specific measures of energy use, energy mix, use of non-energy GHG chemicals, ISO-NE and municipal utilities data on electrical sales and fuel types, etc.).
- **Why?** Initial policy development and corrective policy actions to address shortfalls regarding the effectiveness of current policies, require up-to-date knowledge of GHG emissions in the state. Developing a clear understanding of GHG emissions is critical as we attempt to drive down GHG emissions at a rate of at least 2% of 1990 levels per year.

#### **Policy R3: Develop methods to track progress toward policy goals**

- **Purpose:** Policy guidance, risk mitigation.
- **Details:** The state needs to implement data collection systems to be able to monitor the success of its policies regarding adoption of new technologies. Data collection might include: numbers of heat pump systems, system type, and BTU rating of such systems; sales of ICE and BEV, PHEV and Hybrid vehicles; RMV data, building permit energy information. The results of the data collection should be reported within 3 months of the end of each calendar year.
- **Why?** Initial policy development and corrective policy actions to address shortfalls regarding the effectiveness of current policies, require up-to-date knowledge of progress toward meeting those goals. In a situation in which we are trying, for example, to increase EV sales by 100,000 per year, the state needs up to date information on EV stock.

## **Policy R4: Review policy effectiveness, choice of policies and implement corrective policies on a 3-year interval**

- **Purpose: Risk mitigation, responsible governance**
- **Details:** Define a periodic, frequent review of progress and policy effectiveness to be done over a maximum of a 3-year interval, for example, at the beginning and in the 4<sup>th</sup> and 7<sup>th</sup> year of each decade.
- **Why?** It is impossible to meet the challenge of dramatically and rapidly transforming our whole economy over a thirty-year period without constant review of policy effectiveness and required policy changes, additions or corrections along the way. We have no roadmap that assures success. Our efforts to reduce emissions will be a road strewn with policies that were not as effective as desired. To maximize our chances of success, we must have a robust and nimble framework for periodically reassessing progress and policies and making corrections.

## **Policy R5: Develop a basket of ready-to-go policy choices**

- **Purpose: Risk mitigation, responsible governance**
- **Details:** Develop a basket of policy choices so alternative policies are ready to be implemented. Complete the regulatory review process for each of these so they are ready for implementation as soon as it might be determined that they are needed to keep the state on its desired trajectory
- **Why?** Development and approval of new policies and regulations can be time consuming. Having policies that are ready to be implemented can enable quick policy changes to ensure we are on track to reduce emissions.

## **Policy R6: Design streamlined policy review processes.**

- **Purpose: Risk mitigation, responsible governance**
- **Policy details** Design, as much as possible, and implement a streamlined policy review process that can be nimble and respond to the need for new policies and regulations. Develop a policy review framework that is up to the task of ensuring that the state meets its emissions and policy targets.
- **Why?** – It is impossible to dramatically transform our whole economy over a thirty-year period without the ability to rapidly update and augment policy choices.

## **Policy R7: Ensure Future Non-grid Technologies are Ready When Needed**

- **Purpose: Help ensure that immature technologies and industries that will be needed in later years will, indeed, be ready for deployment when needed**
- **Details:** By 2024, develop policy / market support mechanisms for pilot projects and commercial scale demonstrations of non-grid technologies that will be needed in the future. By 2030 have at least four such pilot/demonstration projects up and running. Incentivize non-carbon fuels, and net-zero biofuels infrastructure, expanded use of hydrogen for transportation and industrial processes, and regional opportunities for carbon capture and storage, including, for example, undersea sequestration. Note E7 is a related policy for grid technologies.

## 4. Proposals to strengthen Interim 2030 CECP

### Transforming our Transportation System

This section includes proposals to strengthen the proposed CECP transportation policies. It starts with one new policy, T0, intended to strengthen all of the subsequent proposed policies. Thereafter, policy suggestions are included under each separate policy proposed in the CECP.

#### Strategy T0: Establish 2030 target of 1 million new EVs

- **Purpose: Ensuring target 2030 emissions will be achieved.**
- **Why?** The Governor's 2050 Roadmap clearly says that we will need 1 million EVs on the road by 2030. Why would we then choose a target of 750,000? There are no other policies that will have a greater effect on transportation emissions other than moving to ZEVs. Should efforts to greatly lower VMT work, that would be great, but neither the Roadmap nor the other policies proposed in the CECP can supplant the replacement of 1 million LDVs with ZEVs.

#### Strategy T1: Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions (TCI-P)

Strategy T1 Proposes:

- The Commonwealth signed onto the regional TCI-P cap-and-invest program memorandum of understanding with MassDEP to begin implementing in 2023. Regulated entities are required to purchase emissions allowances. The revenue estimated at \$130M annually would be invested in clean transportation options, (e.g., expanding EV charging network, EV incentives, electrifying buses, etc.).
- MassDEP would also develop and implement a regional low-carbon fuel standard (LCFS) through a market-based crediting program, similar to Pacific Climate Collaboration (CA, OR, WA, BC). Solutions include biodiesel.

#### Proposed policy changes/additions:

1. **Establish the conditions for reducing the TCI-P emissions cap to ensure that it provides the incentive to hit 2030 and future GHG emissions reduction targets for transportation.**
  - **Purpose – Risk management. Ensuring target 2030 emissions will be achieved**
  - **Why?** We need policies that 1) will ensure that we reach our emissions reduction targets and 2) will provide adequate funding for the state's transportation initiatives. An emissions cap is one way to do that but as planned, TCI-P fails on both accounts. TCI-P caps need to be strengthened. Placing a cap on transportation fuels that corresponds with the state's emissions reduction targets provides guardrails to ensure that we achieve our emissions goals. In that case, if policy development successfully addresses emissions, then cost increases potentially caused by this policy would not come into effect.

Additionally, if TCI-P is the primary mechanism for generating funds for the long list of transportation decarbonization incentives, the \$130M annual revenue cited in the CECP will not cover the costs to the state as early as 2025 and 2030, which could reach \$200M and \$880M respectively, according to the *Transportation Sector Report of the 2050 Decarbonization Roadmap Study*.

2. **Establish a suite of revenue generating sources to support the transportation transformation**
  - **Purpose: Supplement TCI-P as a source of investment for transportation**
  - **Why?** As stated above, TCI-P will not be enough for the state’s transformation of its transportation sector. Even with caps that ensure we meet target emissions, it is not clear that TCI-P would generate enough funds to support all that needs to be done. Evaluate other options, such as raising the gas tax, taxing ride hailing services, congestion fees and eventually taxes on electric charging.
  
3. **This policy needs a better definition for “regulated entities”.**
  - **Purpose: Ensure policy effectiveness**
  - **Why?** The state has the discretion to define these entities more tightly than the “Prime Supplier” definition of the Energy Information Administration (EIA). It is critical that the emissions cap does not have leaks in the system, which would allow uncovered fuels to enter the state, particularly since a few neighboring states have not committed themselves to joining TCI-P.

## **Strategy T2: Implement Coordinated Advanced Clean Vehicle Emissions and Sales Standards**

Strategy T2 proposes:

- MassDEP will adopt and implement the California Advanced Clean Cars II Standard (all new LDV sales must be 100% ZEV by 2035).
- MassDEP will adopt and implement the ZEV purchase mandates of the California Advanced Clean Trucks rule by Dec. 31, 2021 and the Advanced Clean Fleets.
- MassDEP will work with 16 other jurisdictions on a Zero Emission Medium- and Heavy-Duty Vehicle MoU and Action Plan to achieve 30% of new truck and bus sales being ZEVs by 2030 and 100% by 2050.

### **Proposed policy changes/additions:**

4. **Set 2021 as the deadline for adopting California standards and 2023 for MDHDV standards.**
  - **Purpose: Ensuring effectiveness of policy.**
  - **Why?** The earliest possible implementation of new policies is required to impact ZEV and low-emission truck adoption. We are in total agreement with adoption of the California Advanced Clean Cars II Standard, which aligns with the commitment by other countries to adopt similar standards and the pledge by General Motors to supply only BEV Light Duty Vehicles.
  
5. **Establish in 2021 100% ZEV targets for state and municipal fleets by 2035**
  - **Purpose: Set an example for others and encourage EV market development.**
  - **Why?** In previous CECs, there were targets to purchase light- and medium-duty BEVs for state fleets, but this program has not been properly implemented. The state needs to lead by example.
  
6. **Fund research and commercialization pilots for generating alternative fuel sources for MDHDVs and for technologies using those fuels, especially hydrogen.**
  - **Purpose: Build the foundation for future technologies and policy options.**
  - **Why?** Many Medium- and Heavy-Duty Vehicles will not be able to operate effectively on battery power alone. Establishing pilot programs that can help establish economical alternatives by mid-decade will be essential for meeting targets in 2030 and 2040, as well as net-zero by 2050. The

EU has kick-started a large-scale initiative to develop green hydrogen sources and technologies. We can build on those efforts by helping develop markets, so we have additional proven technologies to turn to as soon as possible.

**7. Assess state and local regulations that impede the use of vehicles with hydrogen fuel.**

- **Purpose: Build the foundation for future technologies and policy options.**
- **Why?** Not only should we invest in pilots to test hydrogen fueled vehicles or other alternatives, but we should examine state and local policies that prevent adoption based on outdated knowledge and assumptions. California and countries like Japan are ahead on deployment of hydrogen vehicles, because they have erased outdated restrictions.

### **Strategy T3: Reduce Upfront ZEV Purchase Cost Burden**

Strategy T3 proposes:

- DOER will explore providing MOR-EV rebates at point of sale in 2021.
- EEA and MassCEC will investigate development of a low and moderate income (LMI) consumer program for ZEVs.
- DOER will develop a heavy-duty ZEV incentive program in 2021.

#### **Proposed policy changes/additions:**

**8. In 2021, define initial rebate levels to achieve the goal of having a stock of 1 million EVs on the road in 2030. Identify and secure funding sources as early as possible.**

- **Purpose: Rapid policy development for sectors with long replacement intervals.**
- **Why?** The Commonwealth needs to be realistic about both the required incentives to transform the transportation sector and the necessary revenue to fund it. Establishing specific rebates will help lawmakers and the Administration balance Commonwealth funded rebates with Federally funded rebates. *The 2050 Roadmap Transportation Technical Report* issued in Dec 2020 indicated a required \$4,000 per BEV rebate to reach 2030 goals and \$8,000 to reach 2035 goal of 100% BEV sales. This should include vehicle exchange programs (e.g., cash for clunkers) for low- and middle-income residents.

**9. The Commonwealth should remove rebate limits by car manufacturers.**

- **Purpose: Remove policies which get in the way of the state's goals.**
- **Why?** This is a disincentive to consumers to purchase popular EV models (e.g., Tesla, Chevy Bolt). The goal should be mass electrification, not influencing what models get purchased.

**10. Establish a group purchasing program to lower costs for state/municipal ZEV procurements by the end of 2021.**

- **Purpose: Incentivize ZEV adoption**
- **Why?** The state must enable all levels of government to meet previously set goals for the electrification of their fleets, which will help move the private market toward fleet electrification.

**11. With ISO-NE, establish market conditions to support Vehicle-to-Grid support for the grid**

- **Purpose: Stimulate market development**
- **Why?** Require utilities to establish and promote alternative rate structures that enable ZEV owners to charge their vehicles at times that are beneficial to grid systems (e.g., off-peak or periods of high renewable power generation). This will help align power consumption with

periods of peak power generation. Programs such as this have been successful in California for when solar power generation is highest.

**12. Design, implement and fund Low- and Moderate-Income EV incentive programs starting in 2021**

- **Purpose: To ensure that low- and moderate-income residents do not miss out on expansion of EV adoption**
- **Why?** Low- and moderate-income (LMI) residents will face the greatest hurdles with respect to EV adoption. The hurdles include lack of funds for a large purchase, hurdles finding convenient charging options, etc. LMI resident incentive programs should be immediately implemented to ensure early and ubiquitous LMI EV adoption and to ensure time for policy implementation and improvement to ensure success. Lessons learned from finding ways to incentivize LMI residents will ultimately be valuable for informing programs in other sector areas.

**Strategy T4: Deploy Electric Vehicle Supply Equipment & Enable Smart Charging**

Strategy T4 proposes:

- EEA and DOER will explore a utility-based residential charging incentive program.
- EEA, DOER, and MassCEC will address how to improve DCFC financial viability through pilot projects and seeking to resolve alter current punitive rate structures.
- DOER will analyze and propose potential revisions to rate structures (e.g., demand charges) that may represent barriers to public charging.
- EEA and DOER will explore and support Time-Varying Rates (TVR) and Active Demand Response Programs (SDR) to include in MassSave’s 3-year plan (2022-24)

**Proposed policy changes/additions:**

**13. In 2021, establish targets for the number of charging stations available to the public.**

- **Purpose: Support EV 2030 goals**
- **Why?** Public charging stations and clear incentive programs will be essential to EV adoption and must lead the effort to increase EV adoption. The demand for EVs of all sizes will be dependent on access to a wide variety of charging options, including home, work commercial areas, transit hubs, long-term parking, fleet hubs and on highways. The state needs to establish 2030 targets for the number of charging stations available to the public in accord with the *2050 Decarbonization Roadmap’s Transportation Sector Report*, including sub-targets for residential, multifamily, public and workplace environments, on a county-by-county basis. These targets should be established for 2025, 2030 and 2035, when all new cars are to be BEVs.

**14. In 2021, define initial rebate levels to achieve the EVSE goals. Identify and secure funding sources as early as possible.**

- **Purpose: Support EV 2030 goals**
- **Why?** The policy should clearly state the level of funding required to provide EVSE incentives to build the necessary charging infrastructure. *The 2050 Roadmap Transportation Technical Report* establishes costs to install the charging infrastructure at single family homes (\$1,000) and multi-family homes and at fleet charging sites (\$7,000) . At current funding from VW Settlement and utility EVSE funding programs, there is not enough revenue to provide EVSE rebates for the 750,000 EVs that are anticipated in Massachusetts by 2030.

**15. Provide incentives for EVSE at multi-family properties, starting in 2022**

- **Purpose: Start early to address difficult challenges to ensure policy success**
- **Why?** Provide incentives for multi-family property owners to purchase and install vehicle charging equipment at a target percentage of parking spaces that they provide for their tenants and consider pairing these incentives with penalties for non-compliance. At the outset of the transition to EVs, landlords have little financial incentive to provide charging infrastructure.

**16. Deploy a large number of fast-charging stations on MassPike and Interstate rest areas.**

- **Purpose: Support long-distance EV travelers.**
- **Why?** Fear of losing your charge on long trips is a major barrier to EV adoption. Even if it is a minor portion of total miles driven, car owners will want the assurance that they won't run out of a charge when taking trips of 300 miles or more.

**17. Invest in the grid infrastructure to support EV charging.**

- **Purpose: Ensure that the charging networks have access to the power required to provide charging service.**
- **Why?** Transportation hubs will need significant upgrades to provide enough power for large numbers of charging EVs. Houses, rest stops, and commercial parking lots are also not designed to provide the energy needed to replace the fuel at a gas station. Boston Consulting Group found that the representative utility, depending on charging patterns, will need to invest between \$1,700 and \$5,800 in grid upgrades per electric vehicle (EV) through 2030. The Union of Concerned Scientists estimates that electrifying LDVs will increase power consumption 42%.

## **Strategy T5: Engage Consumers & Facilitate Markets**

Strategy T5 proposes:

- EEA will explore ways to raise consumer awareness of the ownership benefits of electric vehicles.
- MassCEC will:
  - Fund pilot programs on M&HD ZEVs, urban delivery & fleet electrification, and EV charging infrastructure deployment by the end of 2021.
  - Offer technical assistance for MDHDV depot make-ready and fleet transitioning by end of 2021.
  - Continue and expand market development efforts for the clean transportation market.

### **Proposed policy changes/additions:**

**18. Accelerate Consumer Education about EVs**

- **Purpose: Ensure consumers understand the personal and social benefits of transition to EVs**
- **Why?** Rather than explore ways to raise consumer awareness, the EEA should accelerate consumer education with the known benefits of EVs. Not only are the benefits known, but car companies are starting to broadly market their offerings. With the recent announcement from General Motors, consumers should be thinking that their next vehicle will be a BEV or plug-in hybrid

**19. Expand funding for MassCEC to implement pilot programs for MDHDVs**

- **Purpose: Prove that there are economical alternatives to IC engines for MDHDVs**
- **Why?** The largest potential risk to the targets and policies articulated in this section of the CECP is the lack of funding to do what is required to hit our 2030 GHG emissions reductions targets.

## Strategy T6: Stabilize Light-Duty VMT & Promote Alternative Transportation Modes

Strategy T6 proposes:

- EEA, MassDEP, and MassDOT will explore incentives or require reductions to single-occupancy vehicle commuting, targeting a 15% average reduction in commuted VMT/employee by 2030.
- The Commonwealth will continue to encourage and incentivize a broad range of Smart Growth policies

### Proposed policy changes/additions:

#### 20. Improve mass transit by expanding existing MBTA, Commuter Rail, and regional transportation services.

- **Purpose: Reduce the number of single occupancy vehicles on Massachusetts roads.**
- **Why?** We are not going to reduce single occupancy commuting or leisure travel until we increase frequency, convenience and comfort of mass transit options, and the CECP missed an opportunity by not addressing expansion of mass transit.
  - The Boston metro areas mass transit system does not provide a convenient, comfortable and reliable alternative to driving; and it does not support travel patterns other than in and out of Boston. Trains are old and require too frequent maintenance.
  - There are poor rail and bus transit options in the Cape, New Bedford/Fall River and western MA. It is easier to go to Hartford and NYC than Boston from Western MA
  - It is already proven that good mass transit alternatives spur development near stations, without the need to provide further incentives

#### 21. Electrify the MBTA Commuter Rail System by 2035

- **Purpose: Create clean, more reliable commuter rail service**
- **Why?** By implementing the MBTA Rail Vision approved by the Fiscal and Management Control Board, commuter trains will reduce emissions, improve local air quality, and enable the service to run like subway trains—speeding up and slowing down faster.

#### 22. Implement congestion charges to directly fund investments in urban mass transit, road maintenance and charging infrastructure for the Boston, Worcester and other metro areas.

- **Purpose: Incentivize drivers in urban areas to use mass transit.**
- **Why?** Implement congestion charges to directly fund investments in urban mass transit, road maintenance and charging infrastructure, especially for the Boston metro area. In addition, this would ensure that drivers of BEVs who do not pay gas tax will contribute to the upkeep of urban roads. A pilot within Boston downtown would prove the concept for other high congestion metro areas.

#### 23. Develop microtransit pilot projects to extend public transportation options beyond the "end of the bus line", particularly in rural areas.

- **Purpose: To provide incentives for rural residents to reduce use of passenger cars.**
- **Why:** Many rural residents do not use public transportation because it is difficult to access, or public transit does not travel to where residents need to go. Types of microtransit being tested across the country include on-demand transportation, reservations for travel on small vans, subsidies to use services such as Uber/Lyft, and ride-share programs. Some areas are experimenting with purchasing EVs for use similar to self-service car rentals. Microtransit pilot projects could also include expansion of bike share programs to smaller towns (would likely need subsidies).



# Transforming our Buildings

This section includes proposals to strengthen the proposed CECP buildings policies

## Policy B1: Avoid Lock-In of Building Systems That Are Not 2050-Compliant

Policy B1 includes:

- DOER will present a new high-performance stretch energy code to the Board of Building Regulation and Standards in 2021 that allows for Green Communities to opt in starting in 2022 and will become mandatory and effective statewide no later than January 1, 2028.
- DOER will work to eliminate Mass Save incentives for fossil fuel equipment in new construction in 2022 and align incentives with a high-performance building code including incentives for Passive House construction.
- EEA will support establishing state appliance standards by statute. DOER will work to support similar action at the federal level.

### Proposed policy changes / additions:

1. **The stretch energy conservation code should become mandatory and effective statewide by January 1 2024.**
  - **Purpose:** We need to introduce a mandatory high-performance energy code (not a ‘stretch’ energy code, but the basic energy conservation code) in enough time to be sure that new buildings do not lock in antiquated HVAC systems that burn fossil fuels and that will require retrofitting before the end of their useful life.
  - **Why:** We are in a crisis situation. Buildings last a long time so buildings built now need to be, as much as possible, 2050 compliant.
2. **Expand the energy conservation code definition of ‘substantial renovations’ to include a wider range of renovations**
  - **Purpose:** To broaden the jurisdiction of the code so that more renovation projects will trigger full compliance.
  - **Why:** We need to expand the code to more of the existing building stock. This will result in lower building emissions.

## Policy B2: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems

Policy B2 includes:

- DOER will work to phase out incentives for fossil fuel heating systems as soon as possible, limiting fossil fuel heating system incentives in the 2022-2024 Three Year Plan, and ending all fossil fuel heating system incentives by the end of 2024.
- DOER will work to increase electrification through Mass Save programs through air source and ground source heat pump incentives and consumer education in 2022-2024.
- DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in EJ communities through targeted community-based incentive and outreach programs, and increased funding for pre-weatherization barriers.
- EEA and DOER will seek near-term means to enhance MassCEC funding to support continued market development for building decarbonization.

- Mass CEC will refine and enhance workforce development programs related to building decarbonization and will investigate the need for air-source heat pump certification and workforce training.

### Proposed policy changes / additions:

#### 3. Commission social and economic modeling to determine the effectiveness of Policy B2 (in tandem with B3) for the Existing Building Stock:

- **Purpose:** To determine whether the measures proposed in B2 and B3 will actually produce the hugely ambitious changes in the existing building stock needed to achieve the GHG reductions needed by 2030, 2040 and 2050.
- **Details:** Very large sums of money will be required to implement the Energy Conservation Measures (ECMs) proposed in the 2050 Roadmap. For instance, according to the Roadmap, the majority of the existing building stock problem involves single family houses. The cost per square foot to renovate a home for the four Energy Conservation Measures (ECMs) in the Roadmap ranges from \$3.01/s.f. for a heat pump conversion to \$22.26/s.f. for a full deep energy retrofit. These figures seem to us to be substantially low, but for scaling purposes, we will accept them and use the average cost for these four ECMs, about \$15/s.f. There are about 1.42 million such households in Massachusetts totaling 2.9 billion square feet, so if \$15/s.f. cost for those ECMs were spent equally over that floor area, the cost would be \$10,200 per home or \$14.5 billion. That's just for single family houses, which constitute about half of the building stock in the Commonwealth, ignoring small multifamily, large multifamily, commercial buildings and everything else. This raises at least two questions: ***Will the measures in Strategies B2 and B3 actually produce the vast statewide investment needed, and what level of taxpayer-funded incentives will be required?***
- **Why:** Massive, widespread and costly renovations are required to the **5.9 billion square feet** of existing buildings which will still be in place in 2050 to achieve 2030 and 2050 GHG emissions goals. We fear that the proposed measures will not come close to doing the job. Considering the serious risks of failure, we recommend that the EEA engage economic and sociological expertise to model the effectiveness of measures B2 and B3 in the context of the existing building stock.

### Policy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions

Policy B3 includes:

- The Baker-Polito Administration will convene a Commission and Task Force on Clean Heat by May 2021.
- MassDEP will develop and implement by 2023 a long-term declining emissions cap on heating fuels following consultation in 2021 with the Commission and Task Force on Clean Heat regarding the cap structure and levels consistent with meeting or exceeding GWSA required emissions reduction levels.
- The Commission and Task Force on Clean Heat will propose, by 2023, statutory, regulatory, and financing mechanisms needed to ensure the development of reliable and affordable clean heat solutions for the Commonwealth's buildings.

### Proposed policy changes / additions:

4. **Establish the mandate for the Commission and Task Force. Make it permanent. Include implementation in that mandate.**
- **Purpose:** The CECP has addressed the need for an emissions cap by forming a commission and task force. It is essential to make that body permanent and give it a clear mandate with formal goals, deadlines and metrics, and a share of the responsibility for implementation.
  - **Why?** Creating a committee to address a politically charged and highly challenging assignment like this is akin to kicking the can down the road. Making the mandate of that committee formal and clear and detailed, making it permanent and giving it implementation responsibility, will increase the likelihood of success.
  - **Details:**
    - Implementing an effective declining emissions cap, presumably one which produces near-zero greenhouse gas emissions by 2050, is an excellent broad proposal, but the devil will be in the details. As written, these details will be in the hands of an as yet un-convened committee. Making the Commission and Task force permanent, creating a plan with formal goals, metrics and deadlines and details, ensuring that its work is lasting, effective, budgeted and staffed, giving it the power to promulgate regulations, and creating structural links to the Governor’s office and the EEA will make certain that it is more than just a volunteer group that prepares a report for the file. Some other questions that need to be addressed are:
      - What will be penalties for enforcing compliance with the emissions cap? Will this enforcement apply to all building types, including single-family homes?
      - Will these mechanisms use a cap and invest or fee system? How would the proceeds be spent?
      - Will there be incentives in addition to fees and penalties? Would MassSave be the vehicle for distributing these incentives? How many taxpayer dollars will need to be budgeted?
      - How will the Commonwealth influence private decision-making on system replacement near system turnover points? Is there a mechanism for planning and implementing replacement of fossil-fuel burning systems before they fail in emergency situations?
      - What “innovative business models” might be employed?
      - What will fund the capital solutions for low income and affordable housing residents? In particular, how will such solutions encourage or force **private owners of multifamily housing** to reduce GG emissions, and **protect low-income tenants** from rent increases?
      - What will be the mechanisms for implementing energy benchmarking of 5.9 billion square feet of building stock? Will there, for instance, be a requirement for owners to submit **multi-year emissions-reductions master plans**?
      - What will be the mechanisms for financing building decarbonization? **Will there, for instance, be a state-capitalized ‘green bank’?**
      - How can the market for low-carbon liquid or gaseous fuels be drastically up-scaled to supply the percentage of buildings that can’t feasibly be electrified?
      - How can the market for ground-source and air-source heat pumps and air-source hot water heating be broadly **and rapidly** expanded? How can the workforce in these trades be expanded, and **in particular, how can members of EJ communities be introduced in large numbers into this workforce?**
      - How can resistance in the real estate industry to benchmarking, labeling and rental standards be overcome?

# Transforming our Energy Supply

The policies proposed for transforming the energy supply are, in many ways, well thought out and excellent policies. Nevertheless, some have no target dates or milestones for actions and others could/should be strengthened. Proposals for improving specific strategies are listed under each strategy. At the end, a new strategy is proposed to address needed technological development.

## Policy E1: Fill Current Standards & Execute Procurements

Policy E1 proposes

- 7 GW of new clean energy projects. These include 3.2 GW of offshore wind (half of which are under contract), a 1GW transmission line for clean energy from Quebec (to be done in 2022) and 3.2 GW of solar, to be in place by 2030. These are already in the pipeline but need to be brought to completion as early as possible.
- Compliance with existing portfolio standards and emission regulations.

### Proposed policy changes / additions:

1. **Set a deadline of end of June 2021 to start the solicitation and contracting for the final 1.6 GW of offshore wind that is part of the 83C program.**
  - **Purpose – Mitigating technical and permitting risks that could threaten completion of installation by 2030.**
  - **Why?** Actions still need to be taken to ensure the installation of these 1.6 GW by 2030. We need to move ahead at a pace that would ensure project completion before 2030, in spite of the possible permitting risks inherent in building offshore projects. There is no reason to delay this effort.

## Policy E2: Develop and Coordinate Regional Planning and Markets

Policy E2 includes:

- Working with other NE states to ensure that ISO-NE's markets are fully compliant with the GWSA. This requires both engagement with other states in the ISO-NE and engagement with ISO-NE to have them adopt changes to their market rules that will support a net-zero energy system.
- Coordinating and planning with other NE states on new energy source procurements (offshore wind, interstate transmission, grid-scale storage, smart grid technologies, etc.).

### Proposed policy changes / additions:

2. **Set a deadline for completing new market rules by the end of 2022.**
  - **Purpose: To provide earliest possible clarity of market rules to enable markets to incentivize development of the grid of the future, easing the need for state support and resources**
  - **Why?** The draft CECP includes no deadline for implementing changes in ISO-NE operations. The state should establish an aggressive deadline for engagement with other states and ISO-NE to complete new market rules, system planning processes, and transparent governance. The earlier these are in place the more profitable and affordable clean energy and energy transition technologies will be. Markets need to support DER, vehicle-to-grid storage, expanded DSM capabilities and grid-scale energy storage through new clean energy forward capacity, spot,

hour-ahead and ancillary markets. Coordination with the other NE states should be initiated immediately to both reap the benefits of that cooperation and provide the experience with any aspects that may need improvement over time.

## **Policy E3: Align Attribute Markets with GWSA Compliance**

Policy E3 includes

- A review of attribute markets (RPS, solar carve-outs, APSP and CPS) in 2022 to ensure "on-pace clean energy development."
- A review of the CES and CES-E programs in 2021 including a review of the role of MLPs in each of these programs in light of the anticipated need for regional clean energy resource development.

### **Proposed policy changes / additions:**

- 3. Develop and support legislation for this legislative session to adjust RPS rate increases to 3% per year and to increase CES rates appropriately.**
  - **Purpose: Mitigating risks of policy development efforts.**
  - **Why?** This would incentivize clean energy options as early as possible in this decade and help ensure that we will reach or exceed our 2030 emissions targets. In addition, should the EEA move ahead with more aggressive goals for clean energy before 2030 (as we recommend), adjusting attribute market clean energy targets will go hand in hand to align energy procurement with market targets.
- 4. Exclude wood waste, wood pellets, and wood specifically harvested for electrical generation from participation in attribute markets.**
  - **Purpose: Preserve our sequestration resource while limiting GHG emissions.**
  - **Why?** We need to conserve our forests for carbon sequestration. Wood emits more GHG than natural gas. Wood emits particulates that exacerbate asthma and other pulmonary illnesses. Over a century or so our forests may re-sequester the carbon released upon burning, but, in the short term, they aggravate global warming with consequences that will take centuries to correct: more sea level rise, temperature rise, forest fires and species extinctions. Finally, the sequestration potential of our forests is critical to achieving our 2050 net-zero target. Future sequestration should be a priority.

## **Policy E4: Continue to Deploy Solar in Massachusetts**

Policy E4 includes

- Minting additional RECs from SREC I and II projects.
- Working with utilities to support planning for and enabling future DER resources and to pilot innovative grid flexibility technologies.
- Developing best practices for siting of ground-mounted solar projects and developing appropriate incentive programs.
- The facilitation of an additional 2GW of new solar between 2025 and 2030.

## Proposed policy changes / additions:

5. **Set a deadline of end of 2023 for concrete plans for piloting DER resources and innovative grid flexibility technologies, including a plan for state funding/incentives, if necessary**
  - **Purpose:** Set concrete targets and goals to make this happen and save the state and consumers money in the long-term
  - **Why?** The earlier these initiatives are completed, the earlier the development of cost-effective new DER resources can begin, the earlier the business environment for new technologies will be clear, and the cheaper and more successful the integration of DER resources will be.
6. **Incentivize the installation of roof-top solar and parking lot solar to ensure maximum build-out. Determine funding sources.**
  - **Purpose:** ease pressure on land-use issues related to ground-mounted solar
  - **Why?** Roof-top solar and parking lot solar do not use precious undeveloped land which is needed for sequestration. It also provides the greatest opportunity to ease the need for distribution system upgrades, given that it provides distributed generation.
7. **Set a deadline of the end of 2022 for ground-mount siting policy development.**
  - **Purpose:** To ensure the most rapid and cost-effective deployment of appropriately-sited ground-mount solar
  - **Why?** The earlier these policies are completed, the earlier the appropriate development of ground-mounted solar can begin. Policy considerations should include minimizing ground-mounted solar on land in forests and near cropland. Solar panels are black and absorb heat. Solar installations have been shown to increase ground-level temperatures. We should avoid adversely increasing ground-level temperatures in forested and other green areas.
8. **Immediately initiate programs to support solar-industry-related job training programs in environmental justice communities. Determine funding sources.**
  - **Purpose:** To ensure that solar job opportunities are equitably distributed
  - **Details:** Initiate job training opportunities for EJ populations immediately, including consideration of issues related to transportation to training/job sites.
  - **Why?** If the state delays addressing training opportunities in EJ communities, jobs will be filled by others. To effectively ensure equitable opportunities and job placement, efforts to train workers in EJ communities and to address barriers to hiring must be an immediate priority.
9. **Programs to incentivize adoption of roof-top and parking-lot solar in EJ communities must be started immediately. Determine funding sources.**
  - **Purpose:** To ensure equitable opportunities to benefit from solar power and rapid solar adoption
  - **Why?** A number of challenges need to be overcome to increase adoption of roof-top and parking-lot solar in EJ communities. These include, lack of wealth with which to purchase a solar system, lack of opportunities for community and co-op solar projects, multi-unit buildings, allocation of costs/benefits between property owners and renters, etc. Addressing these challenges needs to start immediately to ensure that adoption of roof-top and parking-lot solar at the same pace in EJ and low- and moderate-income communities as in wealthier communities and those with more owner-occupied single-family dwellings.

## Policy E5: Develop a Mature Offshore Wind Industry in Massachusetts

Policy E5 includes

- The next steps to strengthen port infrastructure, job opportunities and local supply chain and research related to offshore wind industry
- Working with BOEM and regional stakeholders to identify new offshore lease areas and ensure an on-pace federal permitting process
- EEA commencing plans to procure, construct and interconnect an addition 6 GW of offshore wind between 2030 and 2040

### Proposed policy changes / additions:

#### 10. Increase Off-shore Wind (OSW) by an additional 1.6 GW by 2030.

- **Purpose: Provide additional clean energy for more rapidly expanding RPS requirements; increase market pressure for development of offshore wind infrastructure, and ensure a steady business environment for offshore wind development. Risk management.**
- **Why?** Why wait until 2030 to keep the ball rolling on offshore wind? The wind industry has been plagued by expiring tax credit deadlines and uneven policy development that has made it difficult to develop the technical and financial infrastructure and supply chains needed to ensure that wind energy is affordable and that wind energy jobs will be long-lasting. Ensuring steadier near-term project development will ensure cleaner electricity for the Commonwealth, incentivize completion of expanded and upgraded port infrastructure and transmission upgrades, and will provide a steadier project pipeline and a predictable business environment. Finally, the more zero-carbon the grid, the more will be the gains from electrifying other economic sectors.

#### 11. Immediately initiate programs in EJ communities to support training for jobs in the offshore wind industry

- **Purpose: To ensure that offshore wind energy job opportunities are equitably distributed among the population**
- **Details: Initiate job training opportunities for EJ populations immediately.**
- **Why?** If the state delays addressing offshore wind industry job-training opportunities in EJ communities, jobs will be filled by others. To effectively ensure equitable opportunities and job placement, efforts to train workers in EJ communities and to address barriers to hiring must be an immediate priority. Offshore wind energy jobs will be located in Massachusetts's ports and will require workers with a variety of skills, some requiring maritime experience. This will be an opportunity to re-train workers in dwindling maritime industries for well-paid jobs.

## Policy E6: Incorporate GWSA into Distribution-Level Policy Considerations

Policy E6 includes

- Working with state agencies and the legislature to ensure planning for and development of improvements to the Massachusetts distribution system to maximize our ability to meet the 2050 emissions target.

## Proposed policy changes / additions:

### 12. Expand scope of E6 to include low- and medium-voltage grid-scale energy storage

- **Purpose:** Provide as many tools as possible to distribution system planners.
- **Why?** E6 should include evaluation of behind-the-meter energy storage and low- and medium-voltage energy storage for opportunities to reduce distribution system upgrades, increase reliability and reduce peak demand, both locally and state-wide.

## New Proposed Policy

### Policy E7: Ensure Future Grid-related Technologies are Ready When Needed

- **Purpose:** Help ensure that immature technologies and industries that maybe needed in later years will, indeed, be ready for deployment when needed
- **Details:** By 2024, develop policy / market support mechanisms for pilot projects and commercial scale demonstrations of future grid-related energy technologies. By 2030 have at least four such pilot/demonstration projects up and running
- **Why?** Incentivize such technologies as long-term, multi-day, build-anywhere grid-scale storage; green hydrogen generation, storage, transportation and energy conversion technologies for grid applications; distributed energy technologies that provide flexibility to grid operation and control; and innovative, safer and cleaner nuclear power technologies. These technologies may be needed at scale in our energy system of the future and any one of them might end up being critical to achieving our targets.



# Mitigating Other Sources of Emissions

## Policy N1: Target Non-Energy Emissions That Can Be Abated or Replaced

Policy N1 includes:

- MassDEP will implement regulation limiting the sale of HFCs and support Kigali-compliant policies at the state, regional, and federal level.
- MassDEP will explore additional regulations to minimize SF<sub>6</sub>.

### Proposed policy changes / additions:

- 1. HFCs (Hydrofluorocarbons): Harmonize policy options, for greatest effect, by the end of 2021**
  - **Purpose: Clarify deadlines and applicable policies to reduce HFC.**
  - **Details:** By the end of 2021, the administration shall implement stringent requirements for HFC use. The administration should evaluate the requirements of the Kigali agreement as well as those of the RMP (Massachusetts' Refrigerant Management Program), SNAP (the EPA's Significant New Alternatives Program), and CARB's SLCP (California Air Resources Board, Short-lived Climate Pollutants Policy). These policies compliment and overlap each other. Concerning overlaps, whichever rule is more stringent for each end-use sector shall be adopted by Massachusetts.
  - **Why?** This combination scenario, in concert with Federal commitment to the Kigali HFC International Phasedown Agreement, was modeled to result in emissions 65% below the reference case by 2050, a 51% reduction from 2021 levels and a 21% reduction from 2010 levels.
- 2. HFC: Increase policy and technology options for low-GWP (Global Warming Potential) refrigerants**
  - **Purpose: Building for more HFC reductions in the future**
  - **Details:** By the end of 2021, the administration will explore and implement other feasible actions, including regulations, R+D, facilitation of commercialization to scale, and any other related actions that will facilitate the preparedness of Massachusetts to attain the fastest possible introduction of equipment with the lowest GWP fluids that will work in the MA climate.
  - **Why?** Reducing HFC will be a technology-driven pursuit. We need to provide the foundation for future and better refrigerants and technologies to address this problem.
- 3. HFC: In 2021, MA must begin the regulatory process to update HFC regulations (MA Regulation 310 CMR 7.76) to include heat pumps and other new technologies**
  - **Purpose: 310 CMR 7.76 affects new equipment. Immediate and frequent updating is needed to ensure 2050-compliant equipment.**
  - **Why?** Given that replacement periods of HVAC equipment are about 30 years, equipment sold now (and in the future, as new options arise) needs to be as climate-friendly as possible.
- 4. HFC: Training in best practices and technology implementation.**
  - **Purpose: Ensure equity in training programs.**
  - **Why?** The CECP proposes starting in 2021 to train the growing heat-pump installation workforce in best practices for mitigating HFC emissions from the existing stock, as well as train them to work with zero and low-GWP alternative refrigerants. Given that HFC emissions affect all areas of Massachusetts, training resources will be deployed statewide, especially aimed at bringing new technicians into the field across the Commonwealth. Concerted efforts will be made to

involve EJ Communities and members of those communities in the development of those employment-ready skills. In this way, Massachusetts will have the workforce on track to handle new and existing products as the heat pump installation market ramps up in the next decade.

**5. SF<sub>6</sub> (Sulfur Hexafluoride): Adopt California SF<sub>6</sub> rules in 2021 with a timetable requiring the use of specified lower GWP products. These rules will be fully implemented by 2025.**

- **Purpose:** Ensure quick adoption of available technology in long-replacement-period technology
- **Why?** Instead of just considering doing this, the Commonwealth should revisit and tighten this policy to increase the certainty that Massachusetts businesses will be in compliance with the calendar-year SF<sub>6</sub> aggregate emissions in pounds as per Massachusetts regulation, 310 CMR 7.72 section 1(4)(5)(a).

**6. SF<sub>6</sub>: Investigate opportunities for future SF<sub>6</sub> technologies**

- **Purpose:** Ensure the industry has appropriate access to much lower or zero GWP SF<sub>6</sub> alternate products so as to continue to keep within legal emissions limits as per 310 CMR 7.72 in a greatly expanded electrical grid.
- **Why?** Independently, Massachusetts should evaluate potential in-state development and production of SF<sub>6</sub> phase-out products within the Commonwealth. This includes funding R&D and taking any steps to maximize the commercial readiness of any such promising technology. This exploration should include exploration of statewide employment opportunities for current members of the labor force who are under-employed as well as for displaced workers, EJ community members, those currently excluded from the job market, and those with potential who need training and entry opportunities.

**7. Methane emission related to natural gas distribution network: Develop and implement a pipeline gas phase out plan by 2022 targeting elimination of the use of natural gas by 2050**

- **Purpose:** Eliminate a significant emissions source
- **Details:** By the end of 2022, develop plans to completely phase out natural gas infrastructure by 2050, while, initially, preserving pipelines powering peak-load power plants. The Commonwealth should gather data to indicate which areas are at the limits of natural gas capacity along with those areas that need immediate or near-term upgrades to aging current systems. Phase-out priority should be given to stabilizing or reducing demand for natural gas and avoidance of new fossil-fuel infrastructure in geographic areas at the limit of current natural gas availability. Current and future requests for natural gas line expansions or compressor stations, should be prioritized for clean energy alternatives with assistance to homeowners, businesses, and communities in the areas serviced by these expansion requests to make the clean energy switch.
- **Why?** Unless we phase out natural gas by 2050, 30% to 35% of remaining emissions will be from burning natural gas and from gas leaks. These emissions will be from maintaining the natural gas infrastructure to power peak-load power generation plants. We need to be more creative at thinking about how to address peak loads (using distributed energy resources, grid-scale energy storage, etc.). Eliminating pipeline gas will take a chunk out of future emissions and need not jeopardize grid reliability. For example, the European Union has initiated a major effort to ensure that hydrogen replaces many fossil-fuel uses. We should be able to build on their efforts to use hydrogen production (or other possible storage/generation technologies) for peak load generation. A plan initially preserving pipelines powering peaking plants, moves us forward in eliminating natural gas infrastructure while ensuring the existence of appropriate new

technologies to allow the final retirement of the remaining infrastructure that would feed peaking power plants.

## Policy N2: Implement Best Practices Around Residual Non-Energy Emissions

Policy N2 includes:

- Compliance of best practices around waste, wastewater, and agricultural emissions.
- If Municipal Waste Combustors seek to modify/rebuild facilities, require tighter emissions and efficiency standards based on the latest technology

### Proposed policy changes / additions:

- 8. Mitigate methane release from MSW (Municipal Solid Waste) and WWTP (Waste-water Treatment Plants)**
  - **Purpose: Mitigate GHG pollution from a significant high GWP emissions source**
  - **Details:** Methane capture from anaerobic composting and wastewater treatment processes could be used for electrical generation. This would use fugative methane while neutralizing the very high GWP of methane if it were released into the atmosphere. ·
  - **Why:** GHG emission originated from solid waste and waste-water will be a larger portion of emissions going forward. We need the deployment of technology to capture and neutralize methane. This can be done through creating a fuel for energy generation that can be deployed in a number of applications.
- 9. Solid Waste: Update regulations on new, modified, rebuilt, or re-licensed waste combustors, both municipal and private, in keeping with environmental justice goals.**
  - **Purpose: Ensure that any waste combustors are ensured harmless to their geographic neighbors.**
  - **Details:** These facilities or other combustion facilities will not be sited in EJ or other communities where residents suffer higher than average health risk factors. If new, low-emission municipal waste combustors are to be built, local communities in which they may be sited, particularly EJ communities, must be included in the decision-making process.
  - **Why?** To avoid and reduce health risks in communities in the siting of combustors recognizing that EJ communities are already bearing disproportionate health burdens due to siting of many types of facilities in those neighborhoods.
- 10. WWTP Develop wastewater processing emissions reduction plans**
  - **Purpose: Make progress on reducing wastewater processing emissions.**
  - **Details:** Develop regulations requiring septic system owners to follow best practices in 2021. Evaluate technologies, challenges and policies to help transition more residences from stand-alone septic systems to managed sewer systems. And evaluate the potential for anaerobic digesters at wastewater treatment plants (WWTPs). Develop, by 2022, and implement, by 2024, policies to support new sewer system hookups and the installation of anaerobic digesters at wastewater treatment plants.
  - **Why?** While wastewater is a small part of current emissions (less than 1%), they will be a larger part of 2050 emissions and will require a sustained effort to address.

#### 11. Complete Agricultural Best Practices Plan by 2023

- **Purpose:** Ensure early promulgation of agricultural best practices to both reduce emissions, particularly of N<sub>2</sub>O (Nitrous Oxide) and NH<sub>4</sub>, and optimize sequestration.
- **Details:** Best practices to improve soils through the Healthy Soils Action Plan (HSAP) should be reviewed for any improvements and an optimal implementation strategy and timeline. Results of this review will be completed by January 2023.
- **Why?** Emissions due to agricultural GHG emissions have been decreasing primarily due to loss of farmlands. That said, meeting GWSA 2050 targets relies on both decreased emissions and increased sequestration. Farming practices provide both of these opportunities. In order to implement such plans incentives must be developed simultaneously to educate farmers and provide incentives of adoption of best practices. All of these should be expedited through use of satellite technologies to evaluate soil emissions and moisture conditions.

# Protecting our Natural and Working Lands

In our responses to the CECP in the Natural and Working Lands section, we have expanded on a number of topic areas which were not addressed in depth by the CECP. These topic areas include: some areas for which EEA is still developing detailed policies, policies related to the soil's role in enhancing sequestration, policies related to the value of wetlands as carbon sinks, stakeholder Involvement, and determining priorities among strategies.

## Policy L1: Protect Natural and Working Lands

### Policy L1 includes:

- As part of the *Resilient Lands Initiative*, EEA will explore creating and funding an expanded suite of incentive-based programs designed to achieve no net-loss of forest and farmland.
- EEA will continue to protect and restore inland and coastal wetlands.

### Proposed policy changes/additions:

#### 1. Strengthen forest and wetlands protection and restoration

- **Purpose:** These proposals add detail to strategies listed. They also include recommendations for priorities, monitoring programs, data collection, and resources for private landowners.
- **Details:**
  - Investigations for new incentives should include both review and consideration of voluntary landowner programs, conservation easements, tax incentives, land use policies, model zoning by-laws, and other tools.
  - EEA should conduct a review of current monitoring and inventory programs and determine where additional monitoring is necessary. For example, it will be important to track conversion of forest and farmland to developed land, track quality of forest and farmland (which will help set priorities for protection and restoration) and monitor and track lands enrolled in voluntary incentive programs. New handheld and satellite technologies could be offered to enlist private forest landowners in monitoring.
  - In addition to monitoring and reporting, voluntary incentive programs that provide benefits to landowners should have enforcement provisions.

#### Specifics for Forest Protection

- Forests should be maintained in their interconnected state as much as possible, maintaining connectivity both within Massachusetts and across state lines.
- Incentives for private landowners should encourage leaving trees to grow as long as possible to enhance carbon sequestration. In addition, with incentive programs for private forest lands, the state could target maintaining areas that encompass the oldest and most complex forests, ensuring protection of soil carbon too.
- EEA should review and revise policies that allow clearcutting on state lands.
- After reviewing existing policies and developing new policies, EEA should prepare a "toolbox" of protection and management strategies for private forest landowners. Tools identified should also include sources of education, training, and assistance.
- EEA should set target emissions and sequestration for forest and forest soils for 2030.

#### Specifics for Farm and Soil Protection

- Incentives should be used to target the best farmlands from permanent conversion to other uses.

- The MA Dept of Agricultural Resources should estimate the need for more local food in the next decades, anticipating trends in pandemics, rise of in-state migration and population increase and associated food insecurity. The conclusions should help determine farmland protection needs.

#### **Specifics for Wetland Protection**

- EEA should lead a team of stakeholders to identify priorities for wetland protection and restoration, keeping in mind their important values for protection against climate change impacts (including resiliency).
- **Why?** The existing strategies lacked detail (to be added when the *Resilient Lands Initiative* and the *Healthy Soils Action Plan* are completed) and the public needs to understand what actions will be pursued to increase carbon storage in forests, wetlands, and soils.

## **L2. Manage for Ecosystem Health and Enhanced Carbon Sequestration**

### **Policy L2 includes:**

- EEA will work to implement and incentivize best management practices identified in the *Healthy Soils Action Plan* and the *Resilient Lands Initiative*.
- EEA will commission additional forest carbon sequestration research, building upon the land use analysis in the 2050 Roadmap, to assess the long-term impacts of sustainable forest management practices.

### **Proposed Policy Changes/additions:**

#### **2. Strengthen details for management of forests, farms and wetlands**

- **Purpose:** Add details to strategies in Policy L2 including recommendations for setting priorities, including monitoring programs, data collection, research, and resources for private landowners. We have also added a recommendation for job creation.
- **Details:**

#### **Specifics for Forest Management**

- Best practices for forestlands should include collection of data on pest occurrences, initial carbon measurements, soil carbon assessments and the protection of the largest, oldest trees (which sequester and store the most carbon), especially those in older, more mature forests. As 67% of forests in Massachusetts are on private lands, forest landowners who accept incentives should agree to provide key data.
- The state should retain the 2012 DOER definitions of the Regional Portfolio Standard (biomass) to prevent burning of wood in biomass plants for power generation.

#### **Specifics for Farm Management**

- Best practices for farmlands should include use of cover crops, conservation tillage/no till practices, improved fertilizer management, including targeted fertilizer treatments, integrated pest management, more diversified crop and livestock production systems,

establishment of trees and shrubs in actively managed areas, and restoration of wetlands and riparian lands.

- Incentive programs should be developed for farmers to use carbon restoration and maintenance practices for soils.
- Outreach programs for farmers, done by experienced extension agents and farm organizations should help teach new practices and the role of farms and soil CO<sub>2</sub> sequestration in helping to address climate change.
- The state should also support research on organic, regenerative and carbon farming practices to best identify the ways in which each increases soil carbon sequestration.
- **Why?** The existing strategies lack details for management of these three environments, (to be added when the *Resilient Lands Initiative* and the *Healthy Soils Action Plan* are completed). The public needs to understand actions that will be pursued for forests, wetlands and soils.

### 3. Job Creation Opportunities

- **Purpose: Develop ways to offer jobs working on mitigating climate change effects on working lands**
- **Why?** Generating jobs working on mitigating climate change effects on working lands offers meaningful opportunities to those who are jobless due to the impacts of climate or the pandemic, or need to transition to renewable technologies. Training should be provided in various areas of forest, wetland and soil restoration techniques as well as monitoring techniques.

## L3. Incentivize Regional Manufacture and Use of Durable Wood Products

### Policy L3 includes:

- EEA will continue exploring opportunities to incentivize the regional use of harvested wood in long-lived products, such as cross laminated timber and wood-based building insulation.

### Proposed policy changes/additions:

#### 4. Evaluate climate-related values of various wood products.

- **Purpose: To weigh forest loss with need to produce forest products and evaluate the relative GHG emissions**
- **Details:**
  - Selection of products should have duration of carbon storage as a priority.
  - Consideration should also be given to products that may in turn reduce toxins and emissions present in alternative uses (e.g., cellulose is safe and can be used as insulation in attics and walls).
  - Third party certification standards must ensure that wood building materials are produced in a sustainable way.
- **Why?** Wood products have sequestration potential, with different time periods to full decomposition. Additionally, some species last longer in products than others. Full carbon gains and losses are rarely counted. Minimizing forest loss should consider both factors.

## L4. Develop Sequestration Accounting and Market Frameworks

### Policy L4 includes:

- EEA will continue working with states and stakeholders across the Northeast to develop the measurement, accounting, and market frameworks necessary to support development of a regional carbon sequestration offset market by the end of 2025.
- EEA will convene an inter-agency Carbon Sequestration Task Force beginning in 2021.
- MassDEP will update the statewide biogenic emissions inventory as needed to support and track verified carbon sequestration.

### Proposed policy changes/additions:

#### 5. Develop details and clear standards for carbon offset markets to effectively reduce emissions

- **Purpose:** Carbon offset markets are a relatively new development for the US and require clear definitions, monitoring, reporting and enforcement provisions to be successful.
- **Details:**
  - The carbon sequestration offset markets developed should include clear monitoring, reporting and enforcement provisions as well as the measurement, accounting, and market frameworks mentioned by the EEA.
  - As some of these markets are voluntary and may apply to private lands, EEA should determine if new legislation is needed.
  - A target range for carbon costs must be approached carefully and should be publicly available for calculations of market plans. (Note: This is an essential starting point but vulnerable to pressure groups. Ex: Carbon Pricing for New England, AG Analysis Group, June 2020 recommends starting at \$25-35 short ton CO<sub>2</sub> in 2025 and \$55-70 in 2030 and 2035. Many economists recommend higher estimates.
  - A good reference is *An introduction to Forest Carbon Offset Markets by the MC Extension*. <https://content.ces.ncsu.edu/an-introduction-to-forest-carbon-offset-markets> Eastern Forestry Notes. This lists three different forms of offsets. Arguably, no forest conversion would be ideal, but forest owners may like to obtain credits for Improved forest maintenance, afforestation, or replanting. Landowners need to demonstrate an ability to maintain their trees, which usually requires considerable water.
  - A measurement protocol should be developed for determining above and below ground carbon levels, initial rates of sequestration, alternatives for increasing the carbon, and monetizing those increases. If non-carbon values are included, e.g., wildlife enhancement, rare habitat protection, etc., the job becomes exponentially more difficult. Technical training for consulting foresters should include training in carbon measurement protocols by state agency personnel including the Massachusetts DOE Division of Fire and Forestry.
  - EEA should include experienced technical experts on the Carbon Sequestration taskforce.
- **Why?** The fate of carbon emissions is critical to follow and reduce, and the use of carbon markets is increasing. Roughly half the GHG emissions have happened in the last 40 years (Boden, T.A., Andres, R.J., and Marland, G. *Global, Regional, and National Fossil Fuel CO<sub>2</sub> Emissions (1751-2014)* (V.2017) and there will be broad attempts to participate in these markets as we move closer to dates by which emissions are to be reduced. The EU has now refused to



take any international carbon credits after 2021; many credits changed their value, accumulating unused, with market effects. Crediting agencies will vary in capacity and reliability.

**We also propose two additional strategies:**

## **L5. Provide Communities with Better Tools to Guide Smart Growth**

- **Purpose:** Communities need better tools to reduce conversion of forest and farmland, to increase carbon sequestration and resiliency on a site-by-site basis, and implement smart growth.
- **Details:**
  - Develop model zoning ordinances on how to site energy projects (solar and wind farms, energy storage, power lines, etc.)
  - Develop model zoning ordinances to allow housing in-fill, smaller houses (1000 square feet or less), no development in floodplains, and smaller lot sizes to facilitate adding housing stock within communities.
  - Develop improved guidance to towns for site planning review (such as using soil with adequate organic content, retaining/adding native trees and native plants, maintaining streams/wetlands and buffers, controlling runoff and reducing impervious surfaces).
  - Develop tools to assist towns in creating more walkable/bikeable communities.
  - Develop incentives for towns to adopt model zoning ordinances, enact smart growth policies and expand/improve walking and biking access.
- **Why?** Forests and farmlands currently serve as carbon sinks which store and sequester carbon and MA needs to retain as much carbon as possible. Towns need better ways to evaluate and plan for development including model zoning policies and smart growth policies which will avoid increasing impervious surfaces, increasing carbon sequestration and increasing resilience to flooding (brought about by climate change). Towns need better ways to evaluate and plan for cluster development near town centers thus reducing vehicle miles traveled, reducing need for additional infrastructure (roads, sewer systems, water systems, etc.), and minimizing loss of farmland and forests.

## **L6. Provide increased funding and technical assistance to Gateway Cities/larger cities to create green spaces.**

- **Purpose:** Conversion of impervious surfaces and/or vacant lots in these communities to green spaces can help improve health, provide spaces for community gardens, outdoor recreation, abatement of the “heat island” effect and increase resilience by absorbing floodwaters.
- **Details:** Increase funding for Gateway City/urban green spaces programs. Involve neighborhoods in planning green spaces. Hire local young people to help create green spaces.
- **Why?** The largest impacts of climate change are experienced by low income/environmental justice communities. Providing green spaces can provide health benefits.

## 4. New Public Accountability Policies

The transition that the administration is designing will result in many changes in the lives of our residents. The state needs to make its residents, businesses, local officials and legislators into partners in this transition in order for it to be successful. This must include providing information to as well as soliciting input from all constituents. It must also include nimbly addressing issues that arise that affect the lives of our citizens.

### Policy A1: Provide robust education to legislators and the public

The transition we are approaching will be more rapid and affect more aspects of our lives than previous changes we have experienced. The state will need to educate consumers, legislators and businesses to get everyone on board.

- **Purpose: Ensure that the public understands what the state is aiming to achieve and how the transition will affect them.**
- **Policy details** – The state administration needs to have on-going programs to educate legislators, local officials, businesses and the public about the overall goals of the transition to a green economy, the rationale behind the steps being taken, the specific steps to be taken along the way, how they will affect them, and what the administration is doing to include everyone in a successful transition.
  - **Web Portal** - This should include a web portal documenting policies being advanced to meet GWSA emissions and technology adoption targets and all progress related to achieving technical and policy goals, etc.
  - **Full public outreach.** - Most importantly, the administration needs to actively engage individuals, town officials, and legislators through public meetings, news media, etc. in the places they live and work. These policies will affect all residents and each needs to be reached in a variety of ways. Communication needs to include information on specific actions required by each resident. For example, residents need to each be informed by letter and by electronic communications about upcoming opportunities/ changes that might affect consumers such as what to do when your furnace is approaching the end of its life. What options are or are not available if your furnace fails.
  - **Education/outreach** - The administration will need to convince the public that climate emissions must be reduced within a decade. Systems of conflict resolution that include climate expertise need to be developed to work at many levels. The administration will need to anticipate and address any fossil fuel disinformation campaigns.
- **Why?** – Ensuring public support and political will over thirty years will require a significant effort to keep everyone informed about what will be and is happening and how their concerns are being taken into account as we move forward.

### Policy A2: Build public accountability into each policy decision

- **Purpose: Ensure robust public participation in this joint effort**
- **Policy details** – The government must build public accountability and feedback from the public into all of its actions related to this energy transition.
- **Why?** – A robust system to seek and address public comments and concerns about policies will be critical to implementing a successful energy transition and encouraging the political will to continue forward on this path. Input on policies should be solicited as policies are being shaped and on the outcomes of those policies with respect to intended and unintended consequences.

### **Policy A3: Initiate a transition Workforce Task Force in 2021**

- **Purpose: address workforce and education needs arising from the energy transition**
- **Policy details** – The workforce task force will address employment needs, skills development and training, displaced worker retraining, situations in which retraining options are lacking, public school education curricula, community college and 4-year college courses to support the transition to a clean economy. The task force will assess needs, evaluate solutions and propose policies and legislation to address the workforce and training issues that need addressing in this transition. The task force will also need to focus on ensuring that the retraining and educational opportunities available are shared equitably across the state, including by environmental justice communities and low- and middle-income communities. Close consultation with unions, training programs, colleges, technology companies, equipment installers, affected businesses, local leaders and leaders of environmental justice communities will be necessary.
- **Why?** – The upcoming energy transition will initiate significant changes in the number and kinds of available jobs, training and educational requirements, the location of jobs, transportation to job sites, etc. The administration must proactively assess, plan for and address these needs to keep the energy transition on course. One model for approaching retraining in the wind industry can be found at: [https://nabtu.org/press\\_releases/nabtu-orsted-sign-landmark-mou/](https://nabtu.org/press_releases/nabtu-orsted-sign-landmark-mou/). The administration must also assess the needs of workers who are displaced in industries that are disappearing due to these transitions. Without a successful effort to bring all workers in MA into the new economy with livable wages through this transition, we will have failed in our moral responsibilities and risk public opposition to facing the challenges that we need to face.

### **Policy A4: Engage Higher Education**

- **Purpose: Tap potential of community colleges, 4-year colleges, universities and students to ensure success.**
- **Policy details** – Educational institutions need support for research related to carbon sequestration, grid-scale energy storage development, materials mineralization, enhanced food security and nutritional value, and much more.
- **Why?** – We need to tap the research potential of higher education in the state to support research into future technology and policy options. We also need to provide a strong foundation for the education of students for the green-economy. We will need new graduates with diverse skills and backgrounds that will keep the energy transition going. As part of their education, students could learn by being involved in the transition they are experiencing by participating in GHG monitoring programs, public education programs, etc.



March 22, 2021

Honorable Kathleen Theoharides  
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The Commonwealth of Massachusetts  
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Submitted electronically: [gwsa@mass.gov](mailto:gwsa@mass.gov)

**Re: Comments on Clean Energy and Climate Plan for 2030 (2030 plan)**

The objective of the Massachusetts Clean Energy and Climate Plan for 2030 is to establish a “blueprint for achieving this limit [45 percent by 2030] equitably and affordably, with major new initiatives advancing decarbonization of the Commonwealth’s buildings, transportation, and electricity sectors.” This undertaking requires collaboration from every sector. As such, the American Petroleum Institute (API) looks forward to being a partner in supporting technology and other efforts that drive real emission reductions.

API represents all segments of America’s natural gas and oil industry, which supports more than ten million U.S. jobs and is backed by a growing grassroots movement of millions of Americans. Our 600 members produce, process and distribute the majority of the nation’s energy, and participate in [API Energy Excellence](#),<sup>1</sup> which is accelerating environmental and safety progress by fostering new technologies and transparent reporting. API was formed in 1919 as a standards-setting organization and has developed more than 700 standards to enhance operational and environmental safety, efficiency, and sustainability.

The natural gas and oil industry, including petrochemical and plastics, supported more than 161,000 jobs, or 3.3 percent of Massachusetts’ total employment in 2018. The industry provided more than \$13.6 billion in wages and contributed \$22.9 billion to the state economy. The United States has reduced carbon dioxide emissions to generational lows since 2000, leading the world in emissions reductions, thanks in large part to greater use of natural gas in electricity generation and advancements in technology and innovation. Many of these emission reductions are a result of natural gas replacing coal-fired power plants.

In Massachusetts, the transportation sector accounted for the largest share (about 42 percent) of the statewide greenhouse gas (GHG) inventory in 2017<sup>2</sup> and work is needed to further reduce the transportation sector share.<sup>3</sup> Massachusetts Department of Environmental Protection data, however, also shows a downward trend in GHG emissions from the light-duty fleet (the largest contributor to the transportation sector total) starting in 2005 that has been offset by increases in GHG emissions from heavy-duty vehicles and non-highway transportation modes (*i.e.*, aviation, marine,

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<sup>1</sup> See <https://www.api.org/oil-and-natural-gas/api-energy-excellence>.

<sup>2</sup> 2017 is the latest year for which a full dataset is available on the Massachusetts Department of Environmental Protection website.

<sup>3</sup> Massachusetts Department of Environmental Protection, “Appendix C: Massachusetts Annual Greenhouse Gas Emissions Inventory: 1990-2017, with Partial 2018 and 2019 Data;” see <https://www.mass.gov/lists/massdep-emissions-inventories#2> (accessed 3/19/2021).



railroad). These shifts are determined by changes in the relative efficiencies and activity levels of the different modes which make up the transportation sector. In order to cost-effectively achieve beneficial reductions in transportation sector GHG emissions, it is important to employ a lifecycle assessment approach to evaluating the technologies deployed by manufacturers to obtain those changes in efficiencies. Only then can a true assessment of the opportunities be fully understood.

API is committed to working with regulators and policymakers to deliver solutions that reduce emissions while meeting society's growing energy demands. API believes that a comprehensive greenhouse gas emissions (GHG) reductions program should recognize that all forms of energy are needed today and in the future. *Efficient, affordable and reliable* energy solutions are essential to sustaining human health and wellbeing while simultaneously improving the global standard of living.

Given that fossil fuels will make up a significant portion of our nation's transportation, generation, and building needs over the next few decades,<sup>4</sup> API supports technology and other meaningful efforts that can drive emission reductions. It is from this perspective that we offer the following comments focused on the transportation and buildings components of the 2030 plan and identify materials that may be helpful in pursuing clear and measurable standards that may benefit all stakeholders.

## A Measured Approach

Transportation - While API appreciates the commitment to act, we believe the Commonwealth should take a measured and practical approach to its transportation policy. Massachusetts recently announced that the Commonwealth along with Connecticut, Rhode Island and the District of Columbia, will launch the Transportation and Climate Initiative Program (TCI-P) which will rely heavily on market mechanisms to fund investments in less polluting transportation options.

We recommend that Massachusetts take time to fully evaluate and understand the environmental, energy, market and social impacts of the TCI-P as it is being implemented across the northeast prior to considering the adoption of more drastic measures such as the forthcoming California state ban on new sales of internal combustion engine vehicles (ICEV). The latter requires significantly more study and evaluation to better understand its potentially unequal impacts on those segments of the Massachusetts population that are most economically vulnerable and disadvantaged by a transition to more costly means of personal mobility.

Buildings - API is concerned that the strategies proposed to eliminate natural gas use for new building construction and incentivize thermal electrification are inefficient and may result in increased consumer costs, an overreliance on the electric system, and may fail to meet the Commonwealth's emissions reduction goals.

## Emissions

Transportation - The transportation sector makes up 28 percent of total U.S. GHG emissions with light-duty vehicles making up 59 percent and medium- and heavy-duty (MDHDV) trucks making up 23 percent. GHG emissions from light-duty on-road vehicles have been reduced by 10.2 percent from 2005 to 2018 while GHG emissions in MDHDV has grown

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<sup>4</sup> See U.S. Energy Information Administration's [2021 Annual Energy Outlook](#).



by 9.4 percent.<sup>5</sup> Our industry will continue to provide and enable improvements in transportation emissions. We already have an established track record in this regard, and we recognize that more work needs to be done to build on the ongoing improvements that are continuing to occur as cleaner vehicles, enabled by lower sulfur fuels, penetrate the fleet.<sup>6</sup> New passenger vehicles are 99 percent cleaner for most tailpipe pollutants compared to 1970.<sup>7</sup>

Advancements in internal combustion engine vehicle efficiency have also helped to reduce carbon dioxide emissions from the transportation sector over the last few decades.<sup>8</sup> In particular, the fuel economy of new cars, trucks and SUVs has increased 29 percent, and their related carbon dioxide emissions have dropped 24 percent since 2004, due in large part to greater industry investment in lightweight vehicle technologies.<sup>9</sup>

The U.S. Department of Transportation and National Highway Traffic Safety Administration studies have concluded that plastics and composite materials – primarily manufactured using petroleum feedstocks – can considerably reduce vehicle weight while still meeting performance and safety requirements.<sup>10</sup> Research anticipates the continuation of these gains, and by 2025, ICEV efficiency could improve by 30 percent<sup>11</sup> and by up to 78 percent in 2050.<sup>12</sup> Additionally, the U.S. Environmental Protection Agency (EPA) is pursuing the Cleaner Trucks Initiative to update its emissions standards for NOx and potentially other criteria pollutants from highway heavy-duty vehicles and engines.

API believes in transparency to the consumer. Accordingly, we believe it is critical that Massachusetts adopt a holistic life-cycle approach that accounts for the vehicle, fuel, and infrastructure to ensure that the consumer is presented with a balanced comparison of the environmental, economic and performance attributes of vehicles when making a purchase decision.

A singular reliance on vehicle tailpipe GHG emissions measurements will result in an evaluation of the environmental performance of different powertrain technologies that is incomplete and insufficient. Or stated another way, this results in an apples-to-oranges comparison. An ICEV generates GHG emissions at the tailpipe while a full battery electric vehicle (BEV) does not. However, a BEV can create more GHG emissions than an ICEV during the vehicles component manufacture/assembly process, and its operation results in additional GHG emissions at the power plant to provide the electricity needed for battery recharging.<sup>13</sup>

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<sup>5</sup> U.S. EPA, “Fast Facts: U.S. Transportation Sector Greenhouse Gas Emissions 1990 –2018,” EPA-420-F-20-037, June 2020, see <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100ZK4P.pdf>.

<sup>6</sup> US Environmental Protection Agency, 2014, “Final Rule for Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards,” see <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-control-air-pollution-motor-vehicles-tier-3>.

<sup>7</sup> See <https://www.epa.gov/transportation-air-pollution-and-climate-change/accomplishments-and-success-air-pollution-transportation>.

<sup>8</sup> See <https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019>.

<sup>9</sup> See <https://www.epa.gov/automotive-trends>.

<sup>10</sup> See <https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB2013103220.xhtml>, and [https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812404\\_computingstudiesreport\\_v2\\_0.pdf](https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812404_computingstudiesreport_v2_0.pdf).

<sup>11</sup> A. Elgowainy, et al, Argonne National Laboratory, 2016, “Cradle-to-Grave Lifecycle Analysis of U.S. Light-Duty Vehicle-Fuel Pathways: A Greenhouse Gas Emissions and Economic Assessment of Current (2015) and Future (2025-2030) Technologies.” See <https://greet.es.anl.gov/publication-c2g-2016-report>.

<sup>12</sup> Massachusetts Institute of Technology, “Road Towards 2050 ...”

<sup>13</sup> ConservAmerica, “Slow Down: The Case for Technology Neutral Transportation Policy.”



To fully assess the environmental performance of different powertrains it is necessary to analyze the emissions generated during all phases of the vehicle lifetime, including those released during the extraction of raw materials used in component manufacture, assembly, vehicle operation, and ultimate disposal.

Additionally, the technology for the recycling of EVs (especially the battery and related electrical components) is currently in a state of infancy and poses unique materials handling and safety challenges.<sup>14</sup> Until these challenges are resolved, these disposal-related issues may create other environmental challenges that go beyond air quality.

**Buildings** - Natural gas also has a proven track record of cutting emissions in both the public and private sector. Over half of households in Massachusetts use natural gas for heating and the state has seen a moderate increase in natural gas consumption in the residential sector over the years; yet emissions have fallen.<sup>15</sup> From 2009 to 2017 (the most recent data available from U.S. Energy Information Administration) the state's residential CO<sub>2</sub> emissions fell 10.8 percent from 13.8 million metric tons of CO<sub>2</sub> in 2009 to 12.3 million metric tons of CO<sub>2</sub> in 2017.<sup>16</sup>

The Massachusetts commercial sector also benefits from emission reductions from the use of natural gas. Between 2009 and 2017, natural gas delivery increased 69 percent from 71,546 MMcf to 121,518 MMcf.<sup>17</sup> During this same period, emissions from the commercial sector fell 48 percent from 5.8 million metric tons in 2009 to 3 million metric tons of CO<sub>2</sub> in 2017.

## Affordability

**Transportation** - It is worth noting that analysis conducted suggests that subsidizing battery electric vehicles (BEV) is an expensive and inefficient way to reduce emissions; and the total cost of ownership places a burden on drivers and taxpayers alike.

Because there are many ways to reduce emissions across many sectors of the economy, it is helpful to have benchmarks on estimated impacts to compare different policies. One such benchmark is the social cost of carbon (SCC). *Resources for the Future* defines SCC as "an estimate, in dollars, of the economic damages that would result from emitting one additional ton of greenhouse gases into the atmosphere."<sup>18</sup> At the end of February, the Biden Administration indicated that they would use the interim value for SCC of \$51 per ton developed by the Interagency Working Group (IWG).<sup>19</sup> Proponents of using SCC as a policy tool explain that costs above this amount may not be warranted when weighing costs and benefits. Although it is unclear what process may follow, it is expected that the IWG will take comment on the science and economics for use in a more comprehensive SCC update scheduled to be issued by January 2022. More

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<sup>14</sup> Kelleher Environmental, "Research Study on Reuse and Recycling of Batteries Employed in Electric Vehicles: The Technical, Environmental, Economic, Energy and Cost Implications of Reusing and Recycling EV Batteries", September 2019. See <https://www.api.org/oil-and-natural-gas/wells-to-consumer/fuels-and-refining/fuels/vehicle-technology-studies>.

<sup>15</sup> See <https://www.eia.gov/state/?sid=MA#tabs-1>.

<sup>16</sup> Residential energy-related carbon dioxide emissions, <https://www.eia.gov/environment/emissions/state/>

<sup>17</sup> See <https://www.eia.gov/dnav/ng/hist/n3020ma2a.htm>.

<sup>18</sup> See <https://www.rff.org/publications/explainers/social-cost-carbon-101/>.

<sup>19</sup> See Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 Interagency Working Group on Social Cost of Greenhouse Gases, U.S. Government, February 2021, [https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf).



generally, to compare policies, analysts often develop a “cost of abatement,” which is a calculation of the cost of the policy.

Although not all BEV-inducing policies have been examined and a cost of abatement has not been calculated for every policy, it is a way to compare policies. The Commonwealth should develop and present to the public its estimate of the cost of abatement for Massachusetts’ program. If it is like most BEV-inducing policies, then the cost of abatement is likely to be high. That is because the BEV technology is relatively expensive while the emissions reductions are relatively modest. According to the *ConservAmerica* paper, the calculated range of costs encompasses about \$300 to \$1,100 per metric ton CO<sub>2e</sub> abated.<sup>20</sup> These costs are from 4 to 23 times the IWG’s social cost of carbon. In addition, this assessment does not consider dozens of additional federal, state, local and utility subsidy programs (for EV manufacturers, EV purchasers, EV charging stations, below-market utility rates, etc.) which would further increase the cost of any emissions abatement.

Regarding the cost of ownership, studies performed by *Argonne National Laboratory*, *A.D. Little* and *IPIECA* also show that the cost of owning a battery electric vehicle representative of current technology is significantly more expensive than a conventional vehicle equipped with an internal combustion engine.<sup>21</sup> In fact, the cost can be 44 percent higher for a compact BEV and 60 percent higher for a mid-size BEV compared to the same sized ICE vehicle (ICEV).<sup>22</sup>

*Buildings* - With respect to home heating, the Massachusetts Department of Energy Resources’ comparison of heating fuel cost-effectiveness found that using natural gas is \$315 less expensive during a winter heating season compared to an air source heat pump. When compared to electric resistance heaters such as electric furnaces, electric baseboard heaters, and electric wall heaters, natural gas is \$3,403 less expensive. Additionally, natural gas infrastructure is less susceptible to weather related outages, specifically disruptions resulting from weather-related incidents.

## Reliability

*Transportation* - The winter climate of Massachusetts may not be conducive to a BEV fleet. According to the U.S. Department of Energy, the average travel range for a fully charged model year 2019 EV is 230 miles.<sup>23</sup> The range and time to charge an EV are affected by the weather. The monthly mean average temperature in Boston, in January, for the last decade is 30 degrees Fahrenheit.<sup>24</sup> According to an *American Automobile Association* report, cold weather can cut an EV’s range by more than 40 percent, or said differently, limit the average travel range to 138 miles in cold weather.<sup>25</sup>

*Buildings* - Natural gas provides reliability and resilience for residential and commercial customers. The deployment of electric heat pumps could be affected by electricity outages in severe weather events, whereas the natural gas systems have historically been proven to be more reliable. Because most natural gas pipelines are buried, the interruptions are not usually widespread. Additionally, the multi-step process to bring natural gas service back online after a shutdown means natural gas cannot be subject to rolling blackouts where the electricity system can be more at risk.

<sup>20</sup> ConservAmerica, “Slow Down: The Case for Technology Neutral Transportation Policy.”

<sup>21</sup> See: A. Elgowainy, “Cradle-to-Grave ...,” John W. Brennan and Timothy E. Bardon, Ph.D, “Battery Electric Vehicles vs. Internal Combustion Engine Vehicles,” Arthur D. Little, 2016. <http://www.ehcar.net/library/rapport/rapport201.pdf>, and IPIECA, “GHG ...”

<sup>22</sup> John W. Brennan, “Battery Electric Vehicles ...”

<sup>23</sup> <https://www.fueleconomy.gov/feg/download.shtml>.

<sup>24</sup> <https://w2.weather.gov/climate/xmacis.php?wfo=box>.

<sup>25</sup> <https://www.aaa.com/AAA/common/AAR/files/AAA-Electric-Vehicle-Range-Testing-Report.pdf>.





The characteristics of natural gas and its transportation network provide the reliability needed for buildings in Massachusetts, especially during the winter months when temperatures are often below freezing.

Limiting new buildings with high-performance stretch energy codes that eliminate fossil fuels will decrease reliability for consumers and have the potential to raise their residential energy costs. The Commonwealth's plan must ensure that no one is left in the cold. Additionally, there should be a realization and an acceptance that oil- and diesel-fired generators may provide emergency backup to heat pumps, and this can have environmental implications particularly during heat waves when ambient air quality can be challenged.

**Conclusion**

API hopes that these comments provide constructive feedback. As this important conversation continues, API will continue to collaborate with the Commonwealth to design solutions which can be broadly applied, are balanced and developed to drive innovation, and are transparent and cost effective.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Michael S. Glaimo', written in a cursive style.

Michael S. Glaimo  
Director, API Northeast Region



March 22, 2021

Kathleen A. Theoharides  
Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

By Electronic Mail: [gwsa@mass.gov](mailto:gwsa@mass.gov)

**Re: Comments in Response to the Draft *Clean Energy and Climate Plan for 2030***

Dear Secretary Theoharides:

NextEra Energy Resources, LLC (NEER) appreciates the opportunity to comment on the *Clean Energy and Climate Plan for 2030 (CECP)*. NEER commends the Baker-Polito Administration and the Executive Office of Energy and Environmental Affairs (EEA) for its commitment to fashioning efficient and effective programs and policies in order to equitably and cost-effectively reduce greenhouse gas emissions through 2030 and beyond.

NEER is a clean energy leader and is one of the largest wholesale generators of electric power in the U.S., with approximately 21,900 megawatts of net generating capacity, primarily in 37 states and Canada.<sup>1</sup> NEER, together with its affiliated entities, is the world's largest generator of renewable energy from the wind and sun and a world leader in battery storage. The business operates clean, emissions-free nuclear power generation facilities in New Hampshire and Wisconsin as part of the NextEra Energy nuclear fleet, which is one of the largest in the United States.

NEER's interest in EEA's draft CECP principally arises from its majority ownership and operation of the Seabrook Station nuclear facility located in Seabrook, New Hampshire.<sup>2</sup> As one of the two remaining nuclear assets in New England, Seabrook Station safely and reliably generates electricity for the benefit of 1.2 million families and businesses. Its operation prevents the emission of nearly four million tons of carbon dioxide annually, which is the equivalent of taking

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<sup>1</sup> As of year-end 2019

<sup>2</sup> NextEra Energy Seabrook, LLC owns 88.2% of Seabrook Station. The other owners are Massachusetts Municipal Wholesale Electric Company (MMWEC) (11.59%) and two Massachusetts municipal utilities, the Taunton Municipal Lighting Plant (0.1%) and the Hudson Light & Power Department (0.08%)

almost 700,000 cars off the road. The plant is operated in a highly responsible manner, and the Seabrook Station team is dedicated to protecting the environment while meeting the energy needs of the region.

Although not explicitly stated in the CECP, NEER understands EEA's greenhouse gas reduction analysis assumes existing emissions-free generation such as Seabrook Station will remain operational through at least 2030. NEER's understanding is bolstered by EEA's comments on the importance of the Clean Energy Standard-Existing (CES-E) to maintaining the viability of important existing emissions-free resources, and its stated strategy actions of exploring program and procurement opportunities for both new and existing resources in the region.<sup>3</sup>

To that end, NEER looks forward to engaging with the Massachusetts Department of Environmental Protection in its scheduled review of the CES-E program in 2021.

In addition to other regulatory programs, NEER urges Massachusetts -- either on its own or in coordination with its regional state partners -- to pursue technology-agnostic solicitations for both existing and new emissions-free generation to lock in the most cost-effective and economic solutions that exist today.

A technology-agnostic solicitation gives the Commonwealth the flexibility to procure a blend of resources to help achieve its goals of decarbonizing the Commonwealth's economy "equitably and affordably."<sup>4</sup> Technology-agnostic procurements will allow the Commonwealth to procure cost-effective, emissions-free resources with the ability to deliver immediately, while incentivizing the development of new emissions-free resources. A procurement program designed to allow existing resources to compete will ensure Seabrook continues to contribute to meeting the Commonwealth's greenhouse-gas reduction mandates.

This concept was successfully put into practice in Connecticut with its Zero-Carbon Resources procurement in 2018. In addition to selecting a variety of new renewable projects -- including solar, storage and offshore wind -- the Connecticut Department of Energy and Environmental Protection selected approximately 1.9 million megawatt hours annually for an eight-year term from Seabrook Station. Seabrook was selected because of its price of 3.3 cents per kilowatt hour levelized, which then-Governor Malloy stated was "projected to save Connecticut ratepayers \$18 million per year over its eight-year term."<sup>5</sup> NEER stands ready to submit a similarly competitive

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<sup>3</sup> Draft Clean Energy and Climate Plan (Dec. 30, 2020) <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

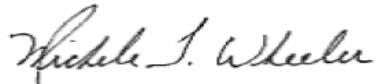
<sup>4</sup> Draft Clean Energy and Climate Plan (Dec. 30, 2020) <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>5</sup> Press Release, Gov. Malloy Announces Zero-Carbon Resource Selections (Dec. 28, 2018) <https://portal.ct.gov/Malloy-Archive/Press-Room/Press-Releases/2018/12-2018/Gov-Malloy-Announces-Zero-Carbon-Resource-Selections>

offer to Massachusetts that would lock in cost-effective, emissions-free energy from Seabrook Station for its citizens.

NEER appreciates the work of the Baker-Polito Administration and the Executive Office of Energy and Environmental Affairs, and the opportunity to comment on this important plan.

Respectfully submitted,

A handwritten signature in black ink that reads "Michele T. Wheeler". The signature is written in a cursive style with a large initial 'M'.

Michele T. Wheeler  
Vice President, Regulatory & Political Affairs  
NextEra Energy Resources, LLC



March 22, 2021

Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Dear Secretary Theoharides:

The Northeast Gas Association (NGA) is appreciative of the opportunity to provide comments on the Clean Energy and Climate Plan for 2030 (CECP), released by the Executive Office of Energy and Environmental Affairs (EEA) on December 30, 2020. EEA invited stakeholder comment on the proposed plan; NGA is pleased to offer comments on several specific elements of the CECP.

NGA is a trade association based in Needham that represents natural gas interests in the Northeast region of the United States – including Massachusetts. Notably for the CECP, the local distribution natural gas companies in the Commonwealth deliver natural gas to 1.7 million customers – from homes and businesses to schools, hospitals and power plants.

Natural gas currently fuels over half the Commonwealth's households and over half of its power generation. It is an affordable and reliable energy source for residences and businesses, and its growth in the state has enabled substantial reductions in air emissions. The ongoing investments in the replacement of older natural gas system infrastructure, facilitated by the Legislature and overseen by the Department of Public Utilities (DPU), has also resulted in reduced methane emissions in the state.<sup>1</sup> Progress in that regard continues today.

We recognize that more needs to be done by our industry and others to meet the expectations of our customers and stakeholders for meeting the climate change challenge. The proposed 2030 plan is ambitious and challenging, but it provides a necessary framework for understanding the evolving energy and environmental structures in the Commonwealth. The CECP's emphasis on a "people-centered approach to reducing GHG emissions in ways that help close the health and economic disparities experienced in Environmental Justice communities" is welcomed and serves as an example of the Commonwealth's leadership on addressing important economic and social justice issues. Sensitivity to cost impacts of public policy decisions on citizens and businesses is an important bedrock element of any clean energy transition.

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<sup>1</sup> We further note that the Massachusetts Department of Environmental Protection ("MassDEP") has undertaken initiatives regarding reductions in methane emissions with targets specifically geared towards the electric generation and natural gas distribution sectors.



The natural gas industry remains committed to being part of the solution to achieving a clean, reliable and affordable energy system. To that end, the natural gas utilities in the state are actively working to reduce the carbon content of their systems – through increased efficiency, the incorporation of renewable natural gas (RNG) and hydrogen, and through the replacement of older pipe components, such as cast-iron and bare steel. We are also looking at how to incorporate geothermal and heat electrification in areas where it benefits our customers and systems. In our comments below, we address some of the opportunities for continuing this progress, and emphasize the importance of affordability and reliability in the Commonwealth’s future energy system. NGA maintains that natural gas has a continuing essential role in helping the Commonwealth advance along the path to a cleaner energy system that is also reliable and affordable.

### **Importance of Energy Efficiency, including Natural Gas Efficiency, as First and Best Option**

The CECP emphasizes the importance of deep building efficiency retrofits as a central least-cost decarbonization solution.

Energy efficiency has been a key part of the Commonwealth’s energy and environmental planning for over twenty years, and has been a national success story. Massachusetts remains a leader in both electric and natural gas efficiency programs, and we believe that the CECP’s continued emphasis on efficiency is critical to future progress. The most recent annual state efficiency study by ACEEE, released in December 2020, observes that Massachusetts spent the second-highest amount in gas efficiency program funding, behind only California, and spent the highest amount of any state in the nation in terms of dollars per residential customer. The commitment to these types of deep and sustaining efficiency investments help consumers save on their energy bills while also maximizing the use of the existing natural gas distribution system. The emphasis on efficiency investments as the first and best option for the Commonwealth to advance toward its overall 2030 energy system goals is one we fully support. “Efficiency first” is a sensible concept and practice.

### **Building Sector Transformation: Opportunities and Challenges; Mitigating Impacts on Energy Affordability**

As the Commonwealth moves to decarbonize the building sector among other areas of the economy, we urge EEA to be sensitive to customer choice and energy and housing affordability for residents and businesses. We are concerned by the potential limitation on residential and commercial energy and heating systems through implementation of municipal stretch goals with net zero requirements.

Governor Baker’s proposed amendments to S.9, released to the Legislature on February 7, 2021, suggested a pathway forward on how this issue should be framed going forward. The Governor suggested finding a balance for how the high-performance stretch code will be introduced, and called for a follow-up regulatory process with significant stakeholder input to consider this important topic. The Governor noted that he is sensitive to the potential cost implications of this transition. We appreciate the Governor’s proposed approach to finding a measured, achievable, practicable and cost-sensitive analysis.

The natural gas industry remains committed to working with the state and all interested stakeholders on improving the energy and environmental performance of the building sector. As the CECP notes,

“emissions in residential and commercial buildings have generally trended downward since 1990 with the deployment of energy efficiency measures.” As stated earlier, we support additional expansion of gas efficiency programs to continue improvements in building envelopes.

Section 3.2 of the CECP details the potential of focusing in this current decade on achieving “very significant reductions from buildings using high-emitting petroleum-based heating fuels: fuel oil and propane.” The CECP goes on to note that “transitioning the building sector in a strategic and least cost manner is challenging.” The CECP further states on page 28 that “transitioning to a heat pump HVAC system will have varying impacts on consumer energy costs” and that households “currently using natural gas for heat may see marginal cost increases in the near term that in most cases can be fully offset by future operating costs savings.”

We have serious concerns about the likely cost impacts to residents through limiting customer choice to only heat pump HVAC systems in the future. Natural gas has grown to be the largest energy source for home heating in the Commonwealth over the last decade, due to its lower cost and affordability, its reliability, and its strong environmental performance vis-a-vis other fossil fuels such as oil and propane. The U.S. Energy Information Administration (EIA), in its 2021 Annual Energy Outlook released on February 3, 2021, projects that natural gas is by far the most affordable residential energy source throughout the forecast period (through 2050) (See Table 3.1 in reference case tables: [https://www.eia.gov/outlooks/aeo/tables\\_ref.php](https://www.eia.gov/outlooks/aeo/tables_ref.php)).

The costs and practicality of electrification remain a concern even as we agree that we all need to strive to transform the building sector. The conceptual approach to a cleaner energy future needs to be thoughtful and mindful of affordability and system reliability, among other critical criteria.

Several studies released by ACEEE in recent years identify value in converting homes heated with heating oil and propane to electricity, but find less benefit in converting natural gas homes, especially in colder climates. In 2018, ACEEE observed: “For the residential sector, recent ACEEE research has found that some applications (oil- and propane-heated homes and homes in the South) can meet the criteria for beneficial electrification discussed above. For these applications it can make sense to electrify the next time a heating or cooling system or water heater needs to be replaced. But for many homes, electrification may not currently make sense and as a result, natural gas use will likely continue for decades, particularly in the North.” Two years later, ACEEE still concluded in a report on electrification efforts at the state level that “[i]n areas with high use of delivered fuels (fuel oil and propane), many programs target customers using these fuels because the economics of electrification in these situations are often better than when displacing natural gas.”

NYSERDA has reached similar conclusions in its look at the economic value proposition for customers in adopting heat pumps. The “New Efficiency: New York - Analysis of Residential Heat Pump Potential and Economics,” assessing the potential of residential heat pumps, noted that “generally, installations replacing natural gas have negative IRRs.”

We recognize the challenge and sense of responsibility faced by state government with these major sectoral transformations envisioned in the CECP. We acknowledge the appropriate action proposed in the CECP on page 32, where EEA states that “by 2023, the Commonwealth will impose a long-term, declining caps on heating fuel (gas, oil, propane) emissions.” All energy industries need to meet the

challenge to reduce emissions in their operations and processes and we in the natural gas industry recognize our responsibility as well. We appreciate the state recognizing in Table 4 the opportunity presented by such goals as pipeline natural gas reducing its carbon intensity by 5 percent. Incorporating RNG and hydrogen blending are options for the natural gas industry to consider as measures to achieve these carbon reductions, along with greater efficiency.

The challenge is great. Approaching this transformation requires careful balancing by all stakeholders of the opportunities and the potential risks in terms of higher costs and reduced system reliability.

### **Importance of Energy Affordability and Economic Equity**

The CECP rightly emphasizes the importance of energy affordability, so particularly important in this challenging time of a pandemic and economic difficulty. Natural gas has been and remains the lowest cost heating option for most households in the Commonwealth, and going forward can help alleviate and/or mitigate economic burdens on residences and businesses in this era of energy transition on which we are embarking.

### **RNG and Hydrogen Opportunities and the Viability of a “Decarbonized Gas” Pathway**

In the CECP at page 27, EEA notes the pathways to a Net Zero future. While EEA supports the deployment of electrification, it includes what it characterizes as a “higher-risk, higher cost ‘decarbonized gas’ scenario.” The risks and costs EEA focuses on are GHG reductions. They do not seem to recognize other risks and cost implications of an all-electric future, such as higher overall energy system costs and the potential for reliability concerns by betting the future on one pathway alone. We urge the Commonwealth to consider a full range of scenarios to reflect more fully the potential for risks and cost shocks to the energy and overall economy.

The “decarbonized gas” pathway that EEA cites would include the “continued use of natural gas, hydrogen, and renewable gas combustion for building services” (CECP at page 27). We feel that this pathway has considerable potential upside for the Commonwealth, particularly in light of the advances being made in the region and in the U.S. in terms of incorporating such resources as RNG. NGA released a major study in 2019 with GTI on the system incorporation of RNG. The study shows that RNG is a supply opportunity that also brings considerable environmental benefits. We encourage EEA to consider even more broadly the incorporation of RNG and hydrogen blending as well, as viable opportunities to assist in the overall decarbonization of the state’s energy supplies.

### **Transportation Sector: CNG and LNG as Fuel Options for Medium and Heavy-Duty Vehicles**

Section 2 of the CECP addresses the transportation sector. As the largest source of GHG emissions in the Commonwealth, the CECP aggressively focuses on transforming the vehicle fleet with a more rapid deployment of electric vehicle (EV) technology. The plan notes that “there are still significant obstacles to achieving widespread EV deployment in Massachusetts.” We would suggest that EEA consider the potential for the inclusion of compressed natural gas (CNG) and liquefied natural gas (LNG) as lower-emission fuels that better serve the medium and heavy-duty vehicle market, particularly over the next decade. We are surprised that the transportation sector analysis is limited only to EV technology. The potential for hydrogen vehicles is also not addressed in the CECP, except for a brief footnote on page 19.



Hydrogen is currently used in the transportation sector as a vehicle fuel, notably in California, albeit on a limited basis. There are a few hydrogen fueling stations in the Northeast region, and there is interest in establishing a "Northeast hydrogen roadmap." We would recommend that the final draft consider incorporating the potential of CNG, LNG and hydrogen as fuel options, especially for the non-passenger vehicle sector, and especially within the timeframe of 2021 through 2030.

Another transportation fuel source not noted in the CECP is RNG itself. In a recent paper on the use of RNG in the transportation sector, the Argonne National Lab of the U.S. Department of Energy noted: "States are beginning to incentivize the use of RNG. In October 2019, the California Air Resources Board amended the state's Heavy-Duty Vehicle Incentive Program, which subsidizes the replacement of older, higher-polluting vehicles with cleaner alternatives...Several other states are encouraging utilities to offer RNG to their customers to help meet state climate goals. Increasingly, communities and businesses view RNG as a key tactic for meeting their sustainability goals and demonstrating their commitment to GHG reduction." A link to the Argonne paper can be found here:

[https://www.anl.gov/sites/www/files/2020-11/RNG\\_for\\_Transportation\\_FAQs.pdf](https://www.anl.gov/sites/www/files/2020-11/RNG_for_Transportation_FAQs.pdf)

### **Reducing Methane Emissions in the Natural Gas Sector**

The CECP states, on page 46, that "methane leaks from the natural gas distribution sector are substantial, but are being reduced significantly because of existing policies, most notably MassDEP's Reducing Methane Emissions from Natural Gas Distribution Mains and Services regulation (310 CMR 7.73)."

This reduction in methane emissions has been significant, due in large part to the efforts of the Legislature, along with the coordinated efforts of EEA and its agencies (the DPU and MassDEP), for their foresight in enacting legislation in 2014 that resulted in the establishment of the GSEP program to manage increased annual gains in the replacement of older system components utilizing cast-iron and bare steel.

Methane emissions related to U.S. natural gas systems have declined by 16.7 percent since 1990, according to the U.S. EPA's draft 2019 national GHG inventory report released in February 2021. At the same time, methane emissions from the gas distribution system have declined by over 60 percent. The report notes: "Distribution system emissions, which accounted for 9 percent of CH<sub>4</sub> emissions from natural gas systems and less than 1 percent of CO<sub>2</sub> emissions, result mainly from leak emissions from pipelines and stations. An increased use of plastic piping, which has lower emissions than other pipe materials, has reduced both CH<sub>4</sub> and CO<sub>2</sub> emissions from this stage, as have station upgrades at metering and regulating (M&R) stations. Distribution system CH<sub>4</sub> emissions in 2019 were 62 percent lower than 1990 levels and 1 percent lower than 2018 emissions. Distribution system CO<sub>2</sub> emissions in 2019 were 69 percent lower than 1990 levels and 1 percent lower than 2018 emissions."

Massachusetts has seen a considerable decline in methane emissions related to natural gas systems. The MassDEP's GHG emissions inventory shows that methane (CH<sub>4</sub>) emissions from natural gas systems declined by 67 percent from 1990 to 2018.

This progress will continue, enhancing system resiliency and reducing system emissions on an approved timetable done in coordination with state regulators and local municipalities.

## **Natural Gas and the Power Sector in New England**

Power generation in Massachusetts and New England relies for half of its generation capacity on natural gas. The CECP envisions sharply reducing that percentage through the addition of state procurements for offshore wind and Canadian hydro, as well as in-state solar and efficiency. The CECP further envisions a fully transformed electric grid facilitated by enhanced regional planning and greater coordination among the states on policy preferences.

As the Commonwealth looks to dramatically reduce the use of natural gas in power generation, it is important in our view to reflect on the values that natural gas brings to the regional power system.

The comparative advantages of natural gas power generation include higher efficiency, lower heat rate, and reduced air pollutant emissions compared to other fossil fuels.

The rise in natural gas use in power generation has led to lower air emissions, from sulfur dioxide to carbon dioxide. In November 2020, U.S. EIA noted: "U.S. electric power sector emissions have fallen 33 percent from their peak in 2007 because less electricity has been generated from coal and more electricity has been generated from natural gas (which emits less CO<sub>2</sub> when combusted) and non-carbon sources."

At the regional level, the same dynamic is in play. ISO-NE reports that since 2001, emissions from power plants in New England dropped by 99 percent for sulfur dioxide (SO<sub>2</sub>), 78 percent for nitrogen oxides (NO<sub>x</sub>), and 42 percent for CO<sub>2</sub>.

Natural gas generation also increases average plant efficiency. As noted by EIA in July 2020, "[i]n recent decades, the U.S. electric power grid's fuel mix has shifted from mostly coal to a more diverse selection of fuels, including natural gas and renewable energy. In particular, the shift toward newer, more efficient natural gas-fired power plants with combined-cycle generators has resulted in an increase in the average efficiency of fossil fuel-fired electric power plants and in lower levels of overall conversion losses."

As other fuel sources have retired from the regional grid in recent years, including nuclear, coal and oil, natural gas has increased its share, supporting overall system reliability. In Massachusetts, several new gas generation units have come online in recent years, including: (1) the 674 MW Salem Harbor station in Salem (June 2018); (2) the 333 MW single-cycle unit added to NRG's Canal 3 Generating Station in Sandwich (June 2019); and (3) the 200 MW peaker at Exelon's plant in Medway. These plants help the state and region in ensuring a stable, affordable and lower-carbon electric system.

Looking ahead it is clear that policymakers in the state and the region are seeking to reverse the role of natural gas in power generation. In our view, the states should proceed with prudence and with a clear-eyed view of the benefits that natural gas generation offers. As the U.S. EIA noted in August 2020:

Natural gas is a key power generation resource because it has the flexibility to supply electricity at any time, including at times of peak demand. In contrast, some renewable energy technologies and nuclear power plants may be nondispatchable and not able to

adjust their generation to meet load. For example, nuclear power plants may already be running at or near maximum capacity and may be unable to respond to shifts in load.

As the state moves to more broadly deployed strategic electrification, the electricity being drawn up will likely be generated by natural gas-fired generating facilities for many years to come. This is not a lamentable situation in our view. Indeed, the availability of natural gas generation provides a secure "glide path" for the power grid as its transformation unfolds.

Thank you for the consideration of our comments. As the Commonwealth continues its progress in moving towards a low-carbon economy with increasing reliance on renewables and clean energy technologies, we believe that natural gas will remain a key sustaining part of the state's energy portfolio. We look forward to working together on creating a reliable, affordable and clean energy future for the Commonwealth.

Very truly yours,

A handwritten signature in black ink that reads "Thomas M. Kiley". The signature is fluid and cursive, with a large, sweeping initial 'T' and a long, horizontal flourish extending to the right.

Thomas M. Kiley  
President and CEO

**Comments on**  
***Interim Clean Energy and Climate Plan for 2030***  
**Chapter 2: Transforming our Transportation Systems**

by

Allan Fierce  
March 22, 2021

Thank you for the opportunity to present these comments on the Interim Clean Energy and Climate Plan for 2030 (“CECP”).

I am a retired environmental lawyer who worked for the Commonwealth of Massachusetts for over 16 years in the Mass AG’s office and at MassDEP. I am currently a member of the Mass chapter of Elders Climate Action. However, the views expressed below are my own.

These comment concern Section 2 of the CECP. Section 2 lays out six strategy actions for transforming our transportation systems to reduce their GHG emissions by about 8 MMTCO<sub>2</sub>e over the next decade.

**Main Comment: While I generally support all six of the transportation strategy actions, I am greatly disappointed that an additional strategy was not included to directly address emissions from all the older model, light-duty vehicles (“LDVs”) that will continue to be driven through 2030, many of which are driven (of necessity) by low- and moderate-income residents of the Commonwealth. Much more could be done to take these vehicles off the road, including the use of a “voluntary accelerated vehicle retirement program” (a subsidized buy-back program) of the type that California currently has in place, or as seen in Senator Schumer’s *Clean Cars for America* program. Both of these programs offer financial incentives to retire older model vehicles. Importantly, such a subsidy program in Massachusetts would help offset the huge disparity in the CECP’s transportation-related funding between the well-to-do, who are by far the primary beneficiaries of EV subsidy programs, and those who cannot afford EVs. This lack of funding equity is glaring. Thus, the CECP’s lack of a subsidized, used-vehicle retirement program runs completely counter to a key expressed aim of the CECP, namely, that it set forth an “equitable” plan. The absence of such a program also leaves on the table a significant volume of GHG emissions from those older LDVs that are causing the most emissions.**

**Further Explanation:**

According to the CECP, today there are just over 5 million light-duty cars and trucks registered in Massachusetts, and that number is expected to grow to about 5.7 million by 2030. Also according to the CECP, even with anticipated incremental increases in the fuel efficiency of

internal combustion engine vehicles (“ICEVs”) over the next decade, to achieve a 45% emissions reduction by 2030, Massachusetts will need to deploy 750,000 to one million zero emission vehicles (“ZEVs”), representing approximately 17% of the projected light-duty fleet in 2030. That, of course, means that 83% of the light duty fleet will remain ICEVs in 2030. That’s over 4.7 million vehicles. Yet the CECP seems resigned to the notion that nothing significant can be done to reduce emissions from even the oldest and least fuel efficient of these ICEVs other than to wait passively for these vehicles to be junked by their final users.<sup>1</sup>

I urge you to reject that notion.

The rate of sales of used vehicles in the US completely overwhelms the sale of new vehicles. Sales of used LDVs in the United States came to around 40.8 million units in 2019. In the same year, only approximately 17 million new light trucks and automobiles were sold in the US. Much of this huge disparity in sales is, of course, due to their disparity in price.

In 2019, the average selling price of used vehicles came to around \$21,000. New cars and light trucks were on average almost \$16,000 more expensive than used light vehicles. Clearly, for those who are the poorest among us, the cost of purchasing and operating any LDV is possible, if at all, only at the low end of the used car market. These are likely to be the oldest cars still operating, and they are likely to have the worst fuel efficiency. Even for those who have somewhat more means, including many front-line and hourly-wage workers, the price of a new car is completely out of reach, and their vehicle purchases are from the used vehicle market, again often older models. But as seen from the fact that about 70% of all light vehicle sales are used, there can be no doubt that the used car market is where the bulk of our car purchases are made . . . and are likely to continue to be made for the foreseeable future.

Moreover, this disparity between buyers of new and used LDVs appears to be trending worse. As the price for new vehicles has been increasing, more Americans are turning towards buying second-hand cars and light trucks. This parallels the latest trend in home buying, where buying a new home (as opposed to an older model) is now typically seen as a privilege that only the wealthy can afford.

So, what can be done here in Massachusetts to take a significant number of our oldest, least efficient LDVs off the road over the next decade? And how can these strategies reduce the huge inequity that results from offering large financial incentives to buyers of new ZEVs (i.e., the wealthy) while offering no financial incentives to low- and moderate income residents to junk their older, least efficient vehicles and upgrade to newer, more efficient used vehicles?

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<sup>1</sup> In the Transportation section, the CECP’s only nod to low- and moderate-income drivers is not about their used vehicles; it’s about developing incentives for them to purchase ZEVs: “*EEA and the Massachusetts Clean Energy Center (MassCEC) are also seeking to develop a [sic] low and moderate income (LMI) consumer programs to help provide more equitable access to the benefits of ZEVs.*” Those programs (and funding for them) are nowhere in sight. By contrast, the Implementation Advisory Committee (“IAC”), in its report, goes considerably further by advocating for both (a) incentives for purchase of used ZEVs and (b) incentives to take older, inefficient ICEVs off the road. EEA appears to have rejected these IAC-suggested strategies.

Without limitation, here are two options:

1. **California’s Voluntary Accelerated Vehicle Retirement Program (“VAVR”):** This program, also known as a car scrappage or old vehicle buy-back program, was originally developed to assist the state in reducing smog. It provides monetary or other incentives to vehicle owners to voluntarily retire their older, more polluting vehicles. Programs of this type have been adopted by other states and nations. A primary goal of VAVR-type programs is to encourage a more timely removal of older, more polluting vehicles from roadways. The hope and expectations is that these vehicles will be replaced with newer, cleaner vehicles or alternative transportation options (e.g., transit and ride-share vouchers). While there has been criticism of these types of buy-back programs that the scrapped vehicles were headed to the junkyard anyway, this criticism appears unfounded.<sup>2</sup>
2. **Senator Schumer’s “Clean Cars for America” Program:** Unlike VAVR-type buy-back programs that aim to reduce GHG emissions simply by paying owners to remove the oldest, least fuel efficient vehicles from the road and then allowing recipients to use the proceeds however they please, programs such as Senator Schumer’s “Clean Cars for America” program aim to combat the climate crisis not only by helping take older ICEs off the road but also by replacing them with cleaner vehicles. Consumers would receive a substantial cash voucher to trade in their gas-powered cars, and these vouchers would then be used to buy a BEV, PHEV, or hydrogen fuel cell car. The value of the voucher would start at \$3000 and ramp up based on the zero-emission range of the vehicle. In order to ensure that lower-income families can benefit from this program, consumers with household incomes less than or equal to 200% of the federal poverty level would receive either (a) an additional \$2000 rebate for use in purchasing a new electric vehicle or (b) a 20% rebate to purchase a used electric vehicle built prior to the program taking effect. More details on this program can be found at:  
<https://www.democrats.senate.gov/imo/media/doc/Clean%20Cars%20for%20America%20-%20Detailed%20Summary.pdf>

It is important to note that consumers who participate in both of these programs continue to be eligible to benefit from all available federal and state tax credits and rebate programs.

As the IAC said in its report: *“Getting our most inefficient vehicles off of our roads is every bit as important as getting the newest technology on the road. New incentives could help residents who are currently driving old and inefficient pickup trucks and SUVs to upgrade to newer and more efficient alternatives.”*

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<sup>2</sup> See 2001 Ph.D. dissertation by Jennifer Lynn Dill at p.2:  
[http://www.web.pdx.edu/~jdill/Files/Dill\\_Dissertation.pdf](http://www.web.pdx.edu/~jdill/Files/Dill_Dissertation.pdf)

Programs like this are needed not only to reduce GHG emissions from our state's transportation sector, which is certainly a critical goal, but also to make the overall emissions-reduction effort in Massachusetts more equitable. Lavishing large state subsidies only on those who purchase new electric vehicles means that only the well-to-do will reap the benefit. We can do better.

I urge you to revise the Interim CECP to include a better balance of transportation-related expenditures between incentivizing sales of new electric vehicles and incentivizing those with older-model used vehicles (our low- and moderate-income drivers) to get those vehicles off the road. Absent programs to do this, you will have failed in your key goal to produce an equitable plan.

Submitted by:

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March 22, 2021

Ms. Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St Suite 900  
Boston, MA 02114

Dear Secretary Theoharides:

Thank you for the opportunity to comment on the Clean Energy Climate Plan (CECP). Clean Water Action submits these comments focused primarily on the Building Sector plan. As the joint comments stress, it is critical that the CECP centers equity and justice throughout the plan, with a people-centered process around policy making. In particular, the populations most impacted by the climate crisis including low income and communities of color must have meaningful say throughout the process. In addition to these overarching principles, we share the following specifics.

**Establish an equitable declining emissions cap.**

Clean Water Action supports a declining cap on heating fuel emissions, but only if the declining cap is carefully designed to ensure that low and moderate income people are not adversely impacted. This requires that the Commission on Clean Heat and Task Force on Clean Heat develop a plan that specifically addresses the needs of low and moderate income homeowners and renters.

Low income residents will not be able to absorb increased costs for heating fuel nor will they be able to invest in building retrofits and technology upgrades. Tenants will have no control over decisions made by building owners.

As a result, a portion of the revenue collected through the sale of emission permits must be used equitably to protect low and moderate income people and residents of environmental justice communities, both owners and tenants. Massachusetts must:

- Provide direct financial assistance to households with incomes at or below 60% of state median income. Assistance must be provided twice annually, at an amount equal to or greater than households' projected increase in energy costs.
- Financial assistance should be provided before the winter heating season and the summer cooling season



- While tax credits and rebates are helpful for households that can wait to receive income, they are not useful for lowest income households, particularly those who do not file income tax due to income below the filing threshold. Delivery of financial assistance should reflect realities faced by low income consumers, including deeper financial insecurity during the pandemic.
- In the short term, until a significant percentage of low income households can be transitioned to electric heating, increase financial support overall for the lowest income fuel consumers. Twenty years ago, Fuel Assistance payments were sufficient to pay a winter's worth of heating bills. Now, they often support 25-30% of winter costs, and private relief programs are not enough to fill the gap. Massachusetts needs to lower emission caps without increasing fires, hypothermia, homelessness linked to no-heat situations or use of improper heating methods.

In a climate like Massachusetts, all residents should have access to heat in the winter, and cooling in the summer. The state should bypass burdensome applications systems and using existing state databases to streamline the provision of assistance, supplementing these systems with a basic application process for those households that do not appear in State databases, or have erroneous information. Because heating and cooling are essential in our climate, state programming should include undocumented immigrants and must be provided in a manner that overcomes fear of retribution. We recommend “on bill” financial assistance, if possible, so that the state, utility companies and providers of deliverable fuels coordinate to deliver financial assistance without application processes or risk to people who are not documented.

### **Invest in 100% incentives for low income housing retrofit.**

Robust investment in housing retrofits should accompany financial assistance—as the Commonwealth’s ultimate goal is not to support continued use of fossil fuels. Both the affordable and market rate efficiency programs should be restructured as “Net Zero” programs. Energy audits should provide consumers alternate pathways to net zero, with recommendations and cost estimates for additional electrical service, if needed, heat pumps, and electric appliances and water heating. Whenever possible, audits should include a “deep energy retrofit” path, with increased insulation/envelope improvements to bring down household energy needs.

For lower income people to make the transition to net zero, the low income programs must expand to include significant funding for pre-weatherization measures needed to make units eligible for efficiency improvements, along with 100% funding for new efficiency measures, electrical service, efficient electrical appliances, and heat pumps. Opportunities for deep energy retrofit should also be made available in the low income program. While more expensive in the short term, these retrofits will save consumers money in the long term and reduce overall pressure on the electrical grid.

In developing low income programs, the Commonwealth should not use cost savings to pay for housing retrofits. Massachusetts has the opportunity to innovate, creating programs that can help lower income residents control escalating energy costs and reverse the long-standing issue of energy poverty and winter heating and summer cooling emergencies.

**Quantify equity commitments.**

Clean Water Action applauds the commitment to equity described in the 2030 CECP plan. For the public to fully understand the dimensions of this commitment, the Baker Administration must set annual and 10-year quantitative targets for:

Total households install heat pumps:

- All households
- Moderate income households (81-125% SMI)
- Low income households (61-80% SMI)
- Very low income households (31-60% SMI)
- Extremely low income households (<30% SMI)

Total households complete deep energy retrofits:

- All households
- Moderate income households (81-125% SMI)
- Low income households (61-80% SMI)
- Very low income households (31-60% SMI)
- Extremely low income households (<30% SMI)

For each income level, the Commonwealth should include estimates for the percentage of households at each level that are:

- tenant households
- households within environmental justice Census tracts (at 60% SMI and below), unsubsidized tenant households

**Complete deep energy retrofits in public/subsidized housing.**

Investments in multi-family affordable housing (project based subsidized housing and public housing) will allow the Commonwealth to efficiently upgrade multiple units and utilize whole building technologies, making these buildings particularly well suited for deep energy retrofits including envelope improvements.

**Protect private market tenants.**

Those who are most likely to suffer in the transition to a clean energy economy are lower income households who survive as best as they can in privately owned housing. These tenants are likely to live in older, lower quality housing, without the efficiency upgrades that can help control heating costs. Planning for retrofits by income level should therefore specifically address how the Administration will meet the needs of households in project based/public affordable housing and how the Administration will meet the needs of low income tenants in privately owned housing without attached subsidies. This will include a specific plan for ensuring that low income tenants do not face rent increases or displacement when a housing retrofit increases the value of their unit.

To the extent possible, Mass Save should preserve 100% incentives on weatherization for moderate income renters and expand this incentive to include 100% incentive for electrification of space heating equipment in units occupied by low and moderate income rents.

### **Update building code.**

Past experience with efficiency programs and lead paint programs suggest that incentives are not enough to convince owners to invest in building upgrades.

That is why incentives should be accompanied by regulation. For new construction, we support the adoption of the stretch energy code as base code by 2028. In addition, we support our colleagues in the building professions who are calling for an opt-in code by 2022 that allows municipalities to require all new construction to be built to net zero. We support their recommendation that this net zero opt-in code become the high performance code in Appendix 15AA by 2025. This code, or an updated one would become the base building code by 2028.

For existing housing, Massachusetts should, within the 2030 CECP, commit to update the building code so that the code prohibits fossil fuel combustion and requires building electrification by 2045. By setting a target date of 2045, the Commonwealth will provide owners with ample time to change energy sources.

A building code change also gives owners added incentive to consider energy incentives offered by MassSAVE or the low income program. For owners, the question becomes, not whether to move from fossil fuels to electricity, but when to make the change. A target date of 2045 is preferable to 2050, because it gives the Commonwealth time to find and address building holdouts, while still meeting 2050 climate goals.

### **Prohibit blended fuels.**

Clean Water Action does not support the use of blended fuels, particularly given the Building Sector Technical Report stating that “the findings of the Energy Pathways Report indicate that widespread adoption of electrification and increased efficiency measures together is likely to be a lower cost decarbonization strategy than an approach that continues to rely on pipeline gas,” the 2030 CECP includes the Decarbonized Fuel Blending Strategy for buildings.

### **Understand health risks and use safer materials in building retrofits.**

Massachusetts should develop a Safer Materials plan, including specifications for materials and technologies to be utilized, and phased out, in building retrofits. While carbon intensity of materials needs to be considered, the Safer Materials plan should focus specifically on the health and environmental hazards of building products, including various insulation and foam products. As we embark on a 30-year plan to tighten buildings and shift energy sources, we need to be mindful of the potential to magnify indoor air quality issues linked to chemicals of concern. The products we use to transition buildings to clean energy should not contribute to the chemical body burden of Massachusetts residents and workers. Health and environmental impacts of materials must be fully addressed up front to prevent unintended consequences. Mass SAVE and low income programs should specify safer materials and, where safer materials are not currently available, the Commonwealth should support research and development of safer options.

**Understand health & environmental risks associated with materials used in new transportation and energy technologies; use safer materials when possible and manage risk.**

As the Commonwealth moves from planning to implementation, the Administration must also carefully consider material selection and full cycle costs in the Electricity and Transportation components of the 2030 plan. For example, many new renewable technologies--wind turbines, photovoltaic panels and fuel cells are being developed with nano-materials that have remarkable thermal, electrical and structural properties but also present novel health and environmental risks. We must consider the life cycle of all materials used in the Commonwealth's clean energy transition, with a clear understanding of how materials are actively used and what their environmental fate will be upon disposal. This will require life cycle safety analyses, and risk management strategies, to balance opportunity and risk.

Thank you for your review of these comments.

Sincerely,

Laura Spark  
Senior Policy Advocate



March 22, 2021

The Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
Boston, MA 02133

**Re: NAIOP Comments on the *Clean Energy and Climate Plan for 2030***

Dear Secretary Theoharides:

NAIOP Massachusetts, The Commercial Real Estate Development Association, is grateful for the thoughtful, data-driven approach the Baker-Polito Administration has taken in the development of policies designed to address climate change - a critical public health, environmental, and economic issue facing residents and businesses. Thank you for your leadership.

The Clean Energy and Climate Plan for 2030 (CECP) establishes a critical blueprint for the Commonwealth's climate goals to achieve an emissions reduction of 45% below the 1990 levels by 2030. NAIOP respectfully submits the following comments on the CECP, understanding that many of the details and overarching strategies may change based on the recent passage of S. 30, *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*. NAIOP hopes that as the CECP develops, your office will continue to engage the public and stakeholders to ensure feedback is incorporated into your planning efforts.

## **I. Municipal Opt-In Energy Code Development**

The CECP proposes a municipal opt-in high-performance stretch energy code that would require passive-house level building envelope efficiency starting in 2022. It would become effective as the statewide energy code no later than 2028. The recently passed climate legislation, S.30, would require the adoption of "a municipal opt-in specialized stretch energy code that includes, but is not limited to, net-zero building performance standards and a definition of net-zero building, designed to achieve compliance with the commonwealth's statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N." In addition, the bill states that the opt-in code should be promulgated "not later than 18 months after the effective date of this act. In so doing, the department may phase in requirements based on building types, uses, or load profiles."

Both the climate bill and the CECP set extremely short timelines for such an ambitious goal. This means that any project currently being planned and

designed will have to seriously consider moving forward without knowing what requirements may be in place by the time the project is ready for permitting.

To relay some data, according to the New Buildings Institute net zero tracker, there are only 139 verified net zero buildings in the U.S. and Canada. If you limit it to Maine/Massachusetts/New Hampshire/Vermont/Connecticut there are only 11 verified net zero buildings. If you further limit it to mercantile, office, multifamily and warehouse, there are six properties in New England, and one in Massachusetts that are verified net zero. There are only nine “emerging” properties in MA, which means they are still in the permitting phase or have been in operation for less than 12 months.

As acknowledged in the CECP, there is not a one-size fits all solution, and not every building in Massachusetts can currently be cost-effectively electrified. Additionally, we were heartened that the CECP recognizes that not every building type has the same footprint, with residential buildings representing the single biggest source of building emissions in Massachusetts. Small scale residential projects are dramatically different from large office towers, lab space or industrial uses.

For opt-in communities to require a building standard that has not been widely practiced due to technological and financial feasibility is cause for concern. Therefore, we urge EEA to modify the CECP to allow for the **development of specialized timelines and compliance pathways for different building use types and load profiles**, including but not limited to energy-intensive universities, healthcare facilities, labs, and data centers. We also ask that EEA **engage in a stakeholder process above and beyond what is required by S.30** to manage and mitigate the impact on critical economic development and large-scale multi-family housing projects. This will ensure that the implementation of this trailblazing policy is managed in a cost-effective and energy conscious manner. Finally, **NAIOP cautions against mandating statewide implementation of this code in 2028** until a careful, thorough economic impact analysis has been conducted in communities that chose to opt-in before that date.

## **II. Building Energy Sources**

While NAIOP certainly believes that net zero carbon is achievable by 2050, we were concerned to see that the CECP recommends ending all incentives for new construction that seeks to use natural gas in 2022.

The natural gas moratorium in 2018 had a devastating impact on commercial real estate, delaying critical housing and economic development projects from coming online for months. We strongly caution against such short timelines in the phasing out of natural gas before the energy grid is migrated fully to green energy in a sustainable and stable way.

### III. Performance and Reporting Standards and Requirements for Large, Commercial and Industrial Buildings

While the CECP does not provide full details of what the Special Commission on Clean Heat and Interagency Task Force on Clean-Heat will address in its work, the Plan does mention that the Commission and Task Force will consider development and promulgation of performance and reporting standards and requirements for large, commercial and industrial buildings.

Many of NAIOP's members currently work within similar municipal regulatory programs. Based on their experiences, we respectfully submit feedback on the proposed performance and reporting standards, outlined below.

a. Minimum Square Footage Requirements

As currently written, the City of Boston's Building Energy Reporting and Disclosure Ordinance (BERDO) requires reporting in all buildings 35,000 SF or over. **Given this example, NAIOP suggests that any such policy develop minimum square footage requirements of 35,000 SF.**

b. Utility Involvement

Ensuring that utilities provide the information to the building owner for reporting is absolutely critical for a successful program. Our members have cited difficulties getting this information in a timely manner from the utilities. In past years, the City of Boston had to extend its reporting deadline for its reporting program due to electricity data quality issues from Eversource. As conversations surrounding the development of these standards continue, utility oversight and accountability will be important.

c. One Uniform Program Needed

As mentioned above, the City of Boston currently has a similar reporting structure in place. Additionally, the City of Cambridge has adopted its own reporting program. NAIOP believes that, if adopted, a uniform, statewide program is the best path to implementation. NAIOP hopes that if such a policy is developed and promulgated, it includes language that preempts existing municipal programs.

d. Fines and Fees

It is important to note that to date, the City of Boston has collected no fines in the implementation of BERDO and has a compliance level of over 90%. As conversations continue around the development and promulgation of a similar statewide policy, NAIOP urges the Task Force and Commission to consider appropriate incentives as part of a proposed program, rather than levying fines or fees to ensure compliance.

#### **IV. EV Infrastructure Expansion**

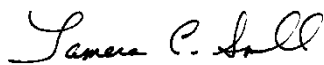
The CECP calls for the increased deployment of electric vehicle infrastructure to support an eventual shift of the vehicle fleet. While a laudable goal, NAIOP would like to strongly emphasize the role of utilities in achieving these requirements.

Currently, in the City of Boston, per site, the City requires a minimum of 25% of the total parking spaces to be electric vehicle supply equipment (EVSE) installed and the remaining 75% of the total spaces to be EV-Ready. When our members have gone to the utilities to attempt to comply with these requirements, the utilities have repeatedly denied installing an additional transformer to allow for compliance, stating that the grid cannot handle the load.

In the development and promulgation of any requirements relating to electric vehicle infrastructure, NAIOP urges the inclusion of language that holds the utilities responsible for achieving the required grid upgrades and expansion before new EV requirements are implemented. Additionally, NAIOP would suggest the development of a pathway for developers and homeowners to demonstrate an inability to comply with any such requirements due to a utility's inability to supply such infrastructure.

NAIOP Massachusetts represents the interests of companies involved with the development, ownership, management, and financing of commercial properties. NAIOP has over 1,700 members who are involved with office, research & development, industrial, mixed use, multifamily, retail and institutional space. Thank you for your consideration of our comments as the CECP continues to develop. Please contact me if you have any questions.

Sincerely,



Tamara C. Small  
Chief Executive Officer  
NAIOP Massachusetts, The Commercial Real Estate Development Association

CC:  
Secretary Mike Kennealy, Executive Office of Housing and Economic Development



# Comments on the Massachusetts Clean Energy and Climate Plan for 2030

Submitted March 22, 2021

Reiner W. Kuhr

Energy Technology  
Economist

reiner\_kuhr@uml.edu



The Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs  
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December 30, 2020

## REQUEST FOR COMMENT ON CLEAN ENERGY AND CLIMATE PLAN FOR 2030

Dear Residents and Businesses in our Commonwealth of Massachusetts,

I am pleased to present the Clean Energy and Climate Plan for 2030 for your review and input. Based on the Commonwealth's nation-leading 2050 Decarbonization Roadmap study effort, also published today,<sup>1</sup> Massachusetts has set its Greenhouse Gas (GHG) emissions reduction target for the next decade at a 45% reduction below the 1990 level in 2030. The 2030 Clean Energy and Climate Plan establishes a blueprint for achieving this limit equitably and affordably, with major new initiatives advancing decarbonization of the Commonwealth's buildings, transportation, and electricity sectors.

Stakeholder engagement with the Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC) and its work groups, including one focused on Environmental Justice, has been integral to the development of this Plan. The IAC's involvement and recommendations over the past two years have been particularly helpful in helping to ensure that the policies and programs in this Plan reflect the Baker-Polito Administration's commitment to a people-centered approach to reducing GHG emissions in ways that help close the health and economic disparities experienced in Environmental Justice communities.

The Executive Office of Energy and Environmental Affairs (EEA) is now seeking broader public feedback on this interim Plan. EEA invites you to participate and submit public comment between January 7 and February 22, 2021, particularly on the specific "strategy actions" identified in the Plan for each major sector of our economy. The [www.mass.gov/2030CECP](http://www.mass.gov/2030CECP) webpage has further information on the public comment process, public engagement events, and different ways for you to submit your comments.

I look forward to your continued engagement and input to inform and help direct our final updates to the Plan, expected in March 2021.

Sincerely,

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs

<sup>1</sup> The series of reports documenting the approach, methodologies, assumptions, results, and synthesis of the findings of the 2050 Decarbonization Roadmap Study are posted on [www.mass.gov/2050Roadmap](http://www.mass.gov/2050Roadmap). Information regarding public engagements around the Study and associated reports is also posted on that website.

# The Clean Energy and Climate Plan requires expensive decarbonization initiatives:

- ▶ As consumers, **what are we paying** for decarbonization through higher electric rates and taxes, and **what are we getting** for those payments? How **much more should we spend on decarbonization**, and at what point are such expenditures **excessive and ineffective**?
- ▶ Should Massachusetts be undertaking aggressive decarbonization policies individually, or should these be **implemented at the regional and federal level to avoid waste and conflicts**?
- ▶ Why are we heavily subsidizing solar power generation in Massachusetts, when **the same investment would result in more than twice the decarbonization in other states** with a better solar resource?
- ▶ Should Massachusetts be selecting and promoting specific technologies, or should the market and competition among a wider range of solutions be allowed to provide **innovation and less costly options**?
- ▶ How much can we **replace reliable and flexible generation from gas fired power plants with inflexible and unreliable renewable generation from wind and solar** before we run into major problems, and can new energy storage facilities economically extend that?
- ▶ Who **is coordinating energy policy** at the regional and federal levels to **avoid inefficiencies, waste and conflicting outcomes**?
- ▶ Shouldn't we be taking a closer look at whether the "best science available" is sufficiently developed and supported before we commit **huge investments and large increases in consumer costs when there are substantial uncertainties and disagreement**??

# These key issues are not addressed in the Clean Energy and Climate Plan:

- ▶ A clear standard for determining **cost effectiveness** and priorities
- ▶ **Integration** of regional, national and global climate policy
- ▶ **Compatibility** with New England power grid planning needs and effective operation of the competitive wholesale electric markets
- ▶ Support for cost-effective innovations and new technologies through **open markets and competition**
- ▶ **Consumer awareness** of the costs, risks and uncertainty they will be subjected to through increasing electric bills, and the associated benefits
- ▶ **Governance and due diligence** consistent with the magnitude of proposed investments and underlying uncertainties, under massive lobbying influence

# My recommendations address four areas:

## Cost effectiveness

- Establish **Social Cost of Carbon (SCC)** as a climate policy **planning criterion**
- Calculate **carbon abatement costs** for policy options
- Evaluate **Inefficiencies and practical limits** to decarbonization

## Policy effectiveness

- Move from state to **regional and national climate strategy**
- **Avoid selecting** specific technologies and projects
- Track **global decarbonization effectiveness**

## Consumer awareness

- Provide **detailed disclosure on bills** for additional costs
- Detail **effectiveness** of investments, uncertainties and risk
- **Shift to voluntary support** of decarbonization costs

## Governance

- Establish clear **regional** rules and oversight
- **Independent review** of basis, costs and effectiveness of policy initiatives
- **Ensure compatibility** with grid operations and markets

# Calculating cost-effectiveness of decarbonization

Establish Social Cost of Carbon (SCC) as the **basis for determining cost effectiveness**

Determine **carbon abatement cost** for decarbonization options

Evaluate **practical limits and added costs** of adding inflexible generation to the grid

**Prioritize initiatives**, conduct due diligence and inform consumers

## The Climate Plan fails to adequately address cost effectiveness of decarbonization initiatives

- ▶ The MA Global Warming Solutions Act authorizes the state to **increase consumer and taxpayer costs** to reduce carbon emissions, and **requires a determination of cost-effectiveness**
- ▶ What does “cost-effectiveness” mean?
  - ▶ Define the **scope and cost** of policy initiatives
  - ▶ Estimate the **effectiveness of these expenditures in reducing CO2 emissions**
  - ▶ Define and agree on a policy basis for evaluating the benefits; what is the **cost of not implementing these policies?**
  - ▶ **Compare** the cost of carbon reduction for each policy option against the cost of not implementing them.
  - ▶ **Evaluate the negative impacts of ineffective policy driven expenditures**

## Social Cost of Carbon (“SCC”)

- ▶ An estimate of the **cost of not reducing CO2 emissions** in \$/ton
- ▶ Provides the **basis for evaluating cost-effectiveness** of policy options
- ▶ Current estimates range from **\$10-50/ton** for the U.S. based on US GAO (right) and work by U of Chicago and others.

**Table 1: Prior and Current Federal Estimates of the Social Cost of Carbon Dioxide per Metric Ton at a 3 Percent Discount Rate in 2018 U.S. Dollars, 2020-2050**

Year of emissions	Prior estimates (based on global climate damages) <sup>a</sup>	Current estimates (based on domestic climate damages) <sup>b</sup>
2020	\$50	\$7
2030	\$60	\$8
2040	\$72	\$9
2050	\$82	\$11

Sources: GAO analysis of data from Interagency Working Group on Social Cost of Greenhouse Gases and Environmental Protection Agency (EPA). | GAO-20-354

Notes: The prior and current federal estimates of the social cost of carbon dioxide were originally reported in 2007 and 2016 U.S. dollars, respectively. We adjusted values for inflation and expressed in 2018 U.S. dollars using the United States Gross Domestic Product Price Index from the U.S. Department of Commerce, Bureau of Economic Analysis.

<sup>a</sup>The prior federal estimates were originally reported in 2007 dollars in the Interagency Working Group’s 2016 Technical Support Document.

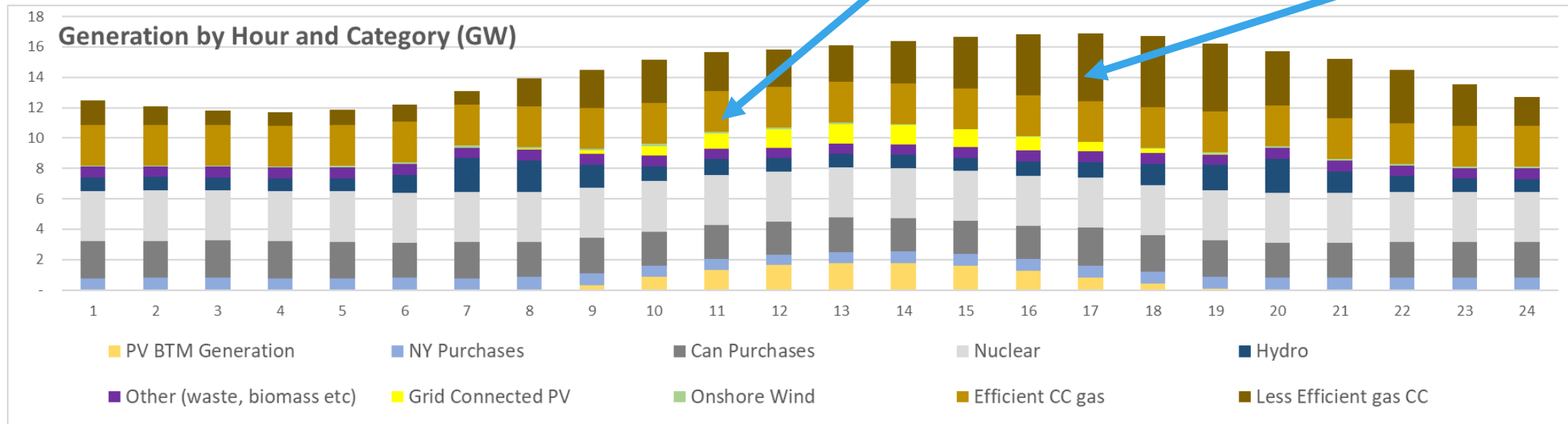
<sup>b</sup>The current federal estimates were originally reported in 2016 dollars in the regulatory impact analysis for EPA’s 2019 Affordable Clean Energy Rule.

# Existing gas fired combined cycle power plants are the primary source of CO2 emissions from the New England power grid

Gas fired combined cycle plants provide most of the reliable, flexible power generation.

Newer gas fired combined cycle plants are more efficient and operate most of the time.

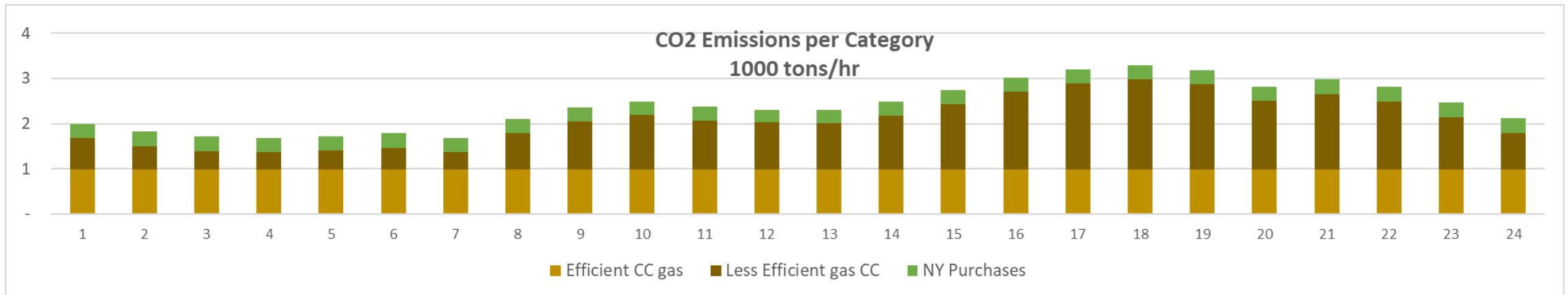
Older combined cycle plants operate during high demand periods when renewables are not available.



Example March low wind day from hourly modeling using ISO-NE 2019 data (BTM PV = behind the meter solar; CC = combined cycle; Can Purchases refer to purchases from Canada)

# Most CO2 emissions from the New England power grid come from gas combined cycle plants and purchases from NY

Most CO2 emissions occur in the evening when solar output drops and demand increases.



Examples from hourly modeling of the 2019 New England grid



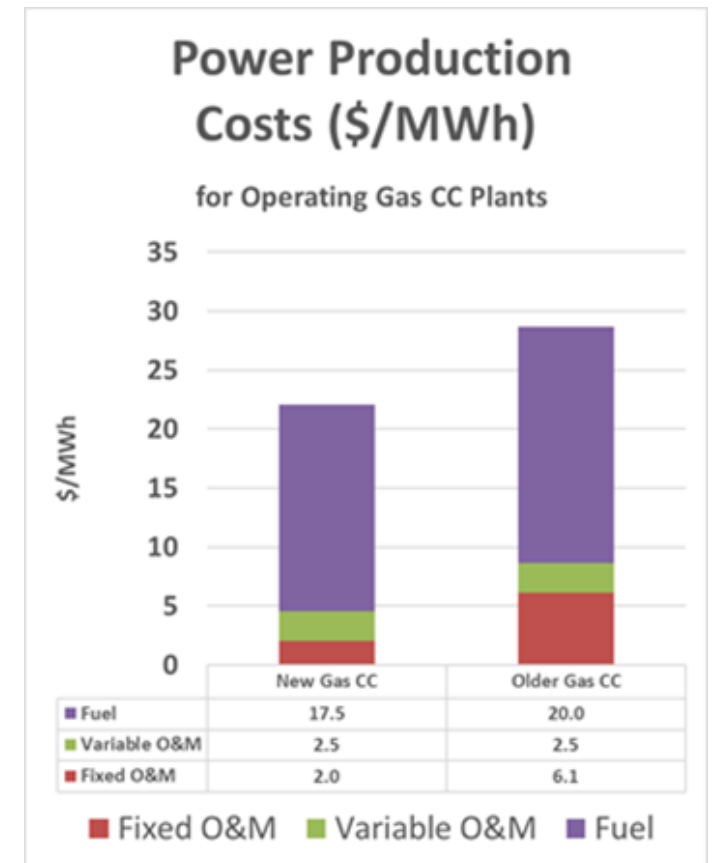
## Decarbonization replaces inexpensive energy from existing gas combined cycle plants with more expensive wind and solar electricity

Gas combined cycle plants set wholesale prices mostly ranging between **\$20-35/MWh** when gas cost \$2.50/MMBTU.

The Climate plan proposes to replace most of this flexible power generation with inflexible solar and wind power generation that will cost between **\$80-350/MWh** in order to reduce carbon emissions.

Each MWh of renewable power generation reduces carbon emissions by about **0.4 ton CO<sub>2</sub>/MWh**. This can be used to calculate carbon abatement costs.

(Costs developed from recent cost and performance data provided by DOE EIA adjusted for New England)

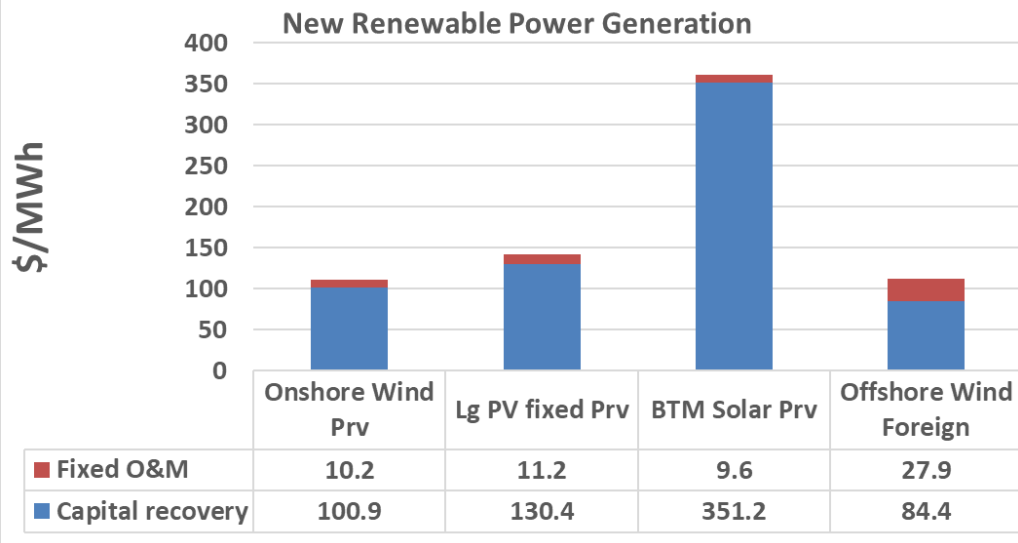


Assumes \$2.50/MMBtu gas

3/22/2021

# Calculating carbon abatement costs

## Power Production Costs (\$/MWh)

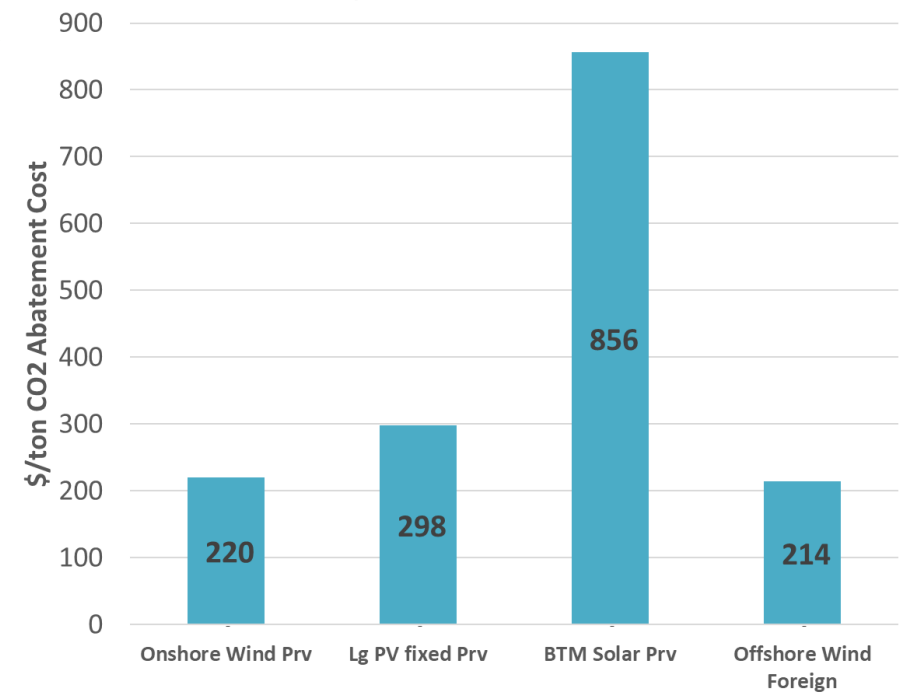


Displace .37-.42 tons CO<sub>2</sub>/MWh



Divide difference in production costs relative to gas combined cycle plants by tons CO<sub>2</sub> avoided

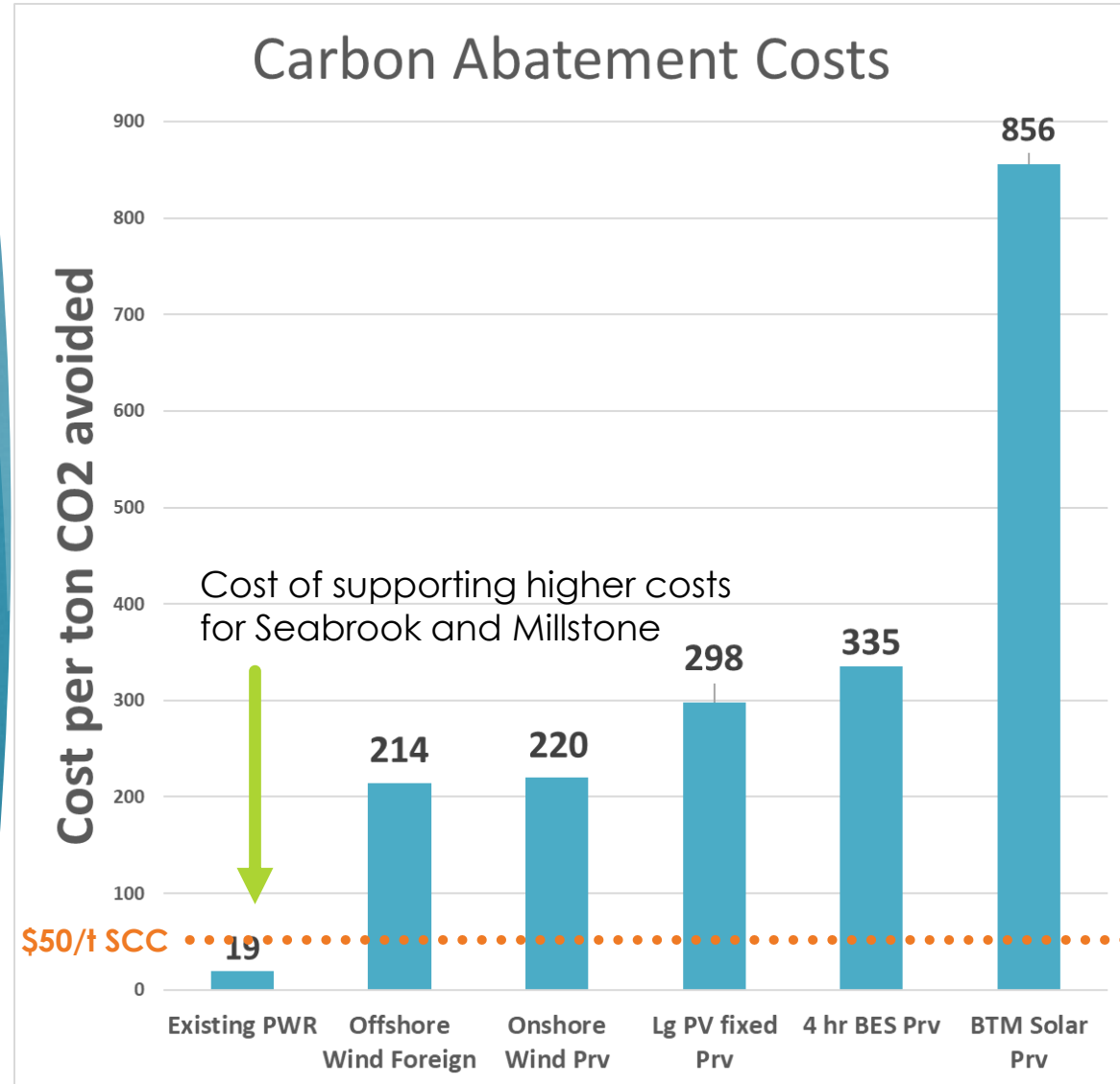
## Carbon Abatement Cost for New Renewable Installations in New England \$/ton CO<sub>2</sub>



LG PV fixed Prv = larger grid connected fixed panel PV; BTM Solar = behind the meter PV; Prv = private financing; Offshore Wind has foreign financing. Gas price \$2.50/MMBtu used for abatement cost.

## Comparing carbon abatement costs

- Behind the meter (BTM) solar is least cost effective
- Extending the life of existing nuclear units is most cost effective
- Other options are not cost effective relative to a \$50/ton SCC
- *More cost-effective options are needed!*



Unsubsidized costs based on EIA and NREL cost data adjusted for New England

# Recommendation #1 -- Cost Effectiveness

## Formalize Social Cost of Carbon and justification for decarbonization effectiveness

- ▶ Establish a **Social Cost of Carbon (SCC in \$/ton CO<sub>2</sub>) for New England** as the basis for determining cost-effectiveness of decarbonization initiatives.
- ▶ **Determine whether regional decarbonization initiatives are likely to be effective** based on regional, national and global status and projected reductions.
- ▶ *Issue annual reports updating SCC and effectiveness subject to public comment and discussion*

## Determine cost-effectiveness of each policy initiative

- ▶ Determine the **carbon abatement cost in \$/ton CO<sub>2</sub>** for each initiative.
- ▶ **Compare carbon abatement costs to the SCC**
- ▶ Evaluate **practical and market limits** that can increase abatement costs
- ▶ Re-align priorities based on **economic prudence**
- ▶ *Issue annual reports with transparent supporting data and calculations for public review and comment*

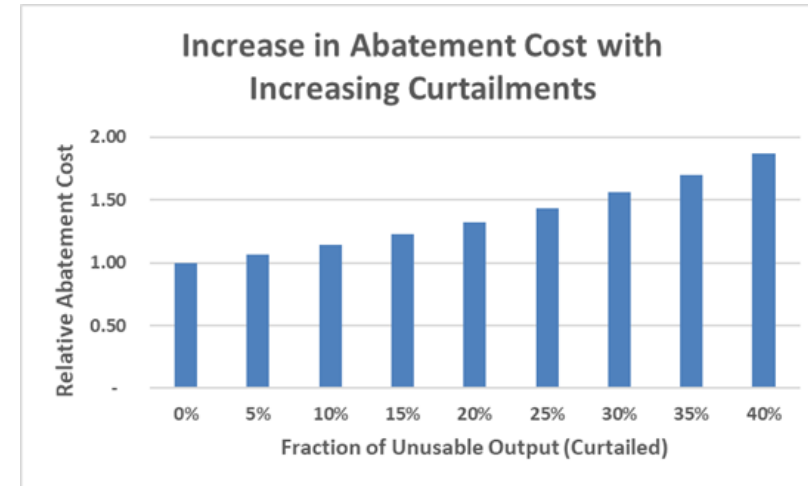
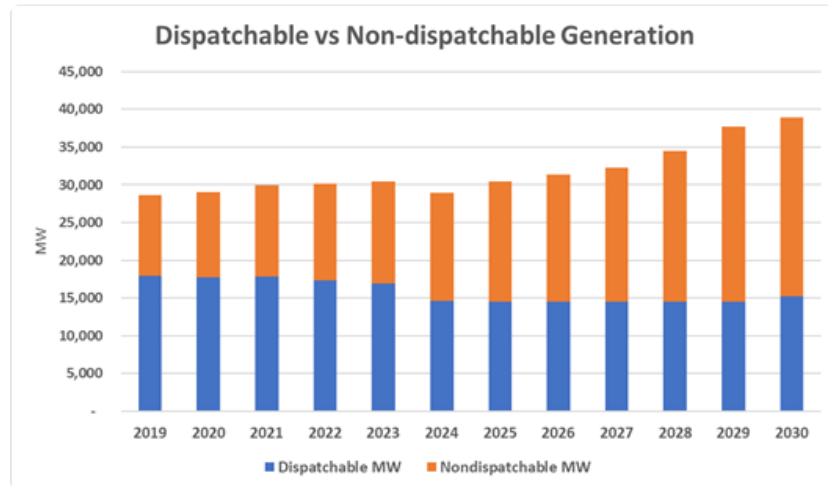
# State initiatives can be inefficient and disruptive

- ▶ Decarbonization strategies are **only effective at regional and national levels** with global participation
  - ▶ Large investments to reduce MA carbon emissions alone will not impact climate change
  - ▶ Lack of global commitment and actions would make US investments in decarbonization ineffective
  - ▶ Some decarbonization initiatives are much more cost effective in other regions (e.g. solar)
- ▶ Consumers in MA may see much higher electric bills than in other states due to decarbonization projects and mandated clean energy purchases, while other states enjoy the same benefits without sharing the cost.
- ▶ **MA consumers pay for decarbonization costs; excessive expenditures on decarbonization hurt the MA economy through high electric bills and push energy intensive businesses to other states.**

# Pushing excessive amounts of renewable capacity into the grid is disruptive and inefficient

- ▶ New England power grid operates as a single competitive system
  - ▶ MA energy policy must not **negatively impact regional power grid reliability and adequacy**.
  - ▶ Forcing excessive inflexible generation into the grid to achieve state targets is **disruptive to regional planning, reliability and operation of the wholesale electric markets**.
- ▶ Forcing construction of selected technologies **discourages competition and innovation** from other options that may be more efficient and more cost effective
- ▶ Creating surpluses of renewable generation will result in negative wholesale energy prices
  - ▶ Surpluses **require curtailment** of inflexible generators which reduces their output and increases their carbon abatement costs (capital recovery and fixed costs spread over smaller energy output)
  - ▶ Negative pricing will **reduce the market value of renewable generation** as experienced in CA
  - ▶ Negative pricing encourages **wasteful use of power**, and discourages other investments and behavior that could be more cost effective than selected technologies
  - ▶ Negative pricing will **increase the need for more subsidies** to provide sufficient revenue to important flexible and non-emitting generation (like existing nuclear plants)

# Practical and Economic Limits



- ▶ Reducing grid CO<sub>2</sub> emissions from 34 to 18 million tpy by adding wind and solar, and increased hydro power from Quebec will result in too much inflexible generation in New England.
- ▶ Curtailments (unusable electricity from renewable generation) may increase to thousands of GWh/yr by 2030
- ▶ Curtailments proportionally increase the carbon abatement costs.
- ▶ Use of battery and hydrogen storage systems substantially increase carbon abatement costs for reducing surplus energy.

# Recommendation #2

## Policy effectiveness

- ▶ **Eliminate state mandated projects and energy procurements** in favor of regional initiatives that are coordinated with ISO-NE to support generation adequacy, reliability, and proper operation of the competitive markets.
- ▶ **Eliminate state energy credits and tax incentives** in favor of regional and national support for decarbonization based on evaluation of cost-effectiveness and a broader range of opportunities.
- ▶ Coordinate with national and international trends to **check effectiveness of decarbonization expenditures** in the context of projected global efforts and results.
- ▶ Provide **broad incentives for decarbonization** such as a carbon tax or uniform clean energy credits rather than selecting specific technologies which may discourage other more, cost-effective solutions.
- ▶ ***Issue an annual report on state participation in regional and national coordination.***



# Public Awareness

- ▶ MA consumers pay **the highest rates for electricity** in the U.S. except for Alaska, Hawaii and Connecticut despite a competitive wholesale market that provides very inexpensive electricity. A large and growing fraction of our bills results from MA decarbonization initiatives.
- ▶ MA utility bills **do not provide sufficient information** to describe how much is being charged for replacing inexpensive power from the wholesale New England market with more expensive, but lower carbon emitting energy.
- ▶ Consumers should be provided with a clear quantitative summary **describing extra charges** associated with state Climate Plan related costs, **and how effective those costs are in terms of CO2 reduction** as an average carbon abatement cost.

# State Mandated Projects

- ▶ MA Climate policy requires distribution companies to purchase energy that is **more expensive than the wholesale market** in order to reduce carbon emissions, such as from several offshore wind projects in various stages of development.
- ▶ Through contracts with distribution companies, project owners of these mandated projects **shift major risks to MA consumers** in order to obtain financing and to secure profitability. These long-term commitments assigned to consumers will not go away if climate goals are not achieved through global cooperation or if more effective options emerge.
- ▶ When surpluses result from excessive inflexible energy generation, **MA consumers will pay more for power** than other states which can take advantage of negative pricing without the long-term burden of paying for these projects.
- ▶ State mandated renewable energy projects that add inflexible capacity to the grid will **increase energy surpluses that impact wholesale markets** and result in increased costs and counter-subsidies to maintain grid flexibility and reliability.
- ▶ **Consumers are not informed about the cost-effectiveness of offshore wind** and other state mandates, and what the impact will be on their electric bills.

# Recommendation #3 – Consumer disclosure of decarbonization costs

- ▶ Require distribution companies to compile and report data in electric bills that clearly summarizes each month what **extra costs are related to decarbonization, and the resulting reductions in carbon emissions.**
  - ▶ Provide details on the cost of renewable energy credits, state mandated projects and other subsidies targeting decarbonization
  - ▶ Show the amount and cost of power purchased from the wholesale power market
  - ▶ Estimate the costs of tax subsidies that result in higher tax payments at the state and federal level
  - ▶ Estimate the amount of carbon emissions that would have occurred without these costs and subsidies
  - ▶ Comment on the overall effectiveness of carbon reductions on potential climate impacts based on an agreed SCC, and an evaluation of the effectiveness of carbon reductions

# Governance

- ▶ Massive proposed investments (\$B's/year) in the presence of strong lobbying and commercial interests require a **full and objective independent review**.
- ▶ Current state and regional energy planning is not well coordinated and lacks governance to **protect consumers from excessive, ineffective spending**, and to support the ability of ISO NE to **operate the regional power grid efficiently**.
- ▶ Governance of climate policy should address
  - ▶ **Transparency of decision-making** based on cost-effectiveness of policy initiatives
  - ▶ **Broad-based regional participation** and understanding of cost-effectiveness
  - ▶ **Integrity of policy decisions** without undue influence of lobbying and special interests
  - ▶ **Formal due diligence** of the basis and uncertainties driving decarbonization strategies

# Key areas for independent review:

1. Reliance on “best science available”
  - ▶ How accurate and reliable are climate models in defining a tipping point as the basis for decarbonization policy?
  - ▶ How accurate and reliable are determinations that human caused carbon emissions create massive climate change impacts as the basis for determining an SCC?
2. Determination of an SCC for New England as the basis for decarbonization policy cost-effectiveness
3. Confirm overall effectiveness of regional climate policy initiatives in reducing global carbon emissions considering the behavior of other countries
4. Completeness and accuracy of determining and comparing carbon mitigation costs for policy initiatives
5. Analysis and disclosure of consumer bill and tax impacts of climate policies

# Recommendation #4 Governance

- ▶ Work with FERC and other states in New England to establish and agree on **rules of governance** for regional oversight and coordination.
- ▶ Undertake a **formal due diligence process** on the cost-effectiveness of Climate Plan initiatives focusing on:
  - ▶ SCC determination and uncertainties
  - ▶ Effectiveness and practical limits of decarbonization
  - ▶ Calculation of carbon abatement costs
  - ▶ Increasing public awareness of costs and benefits
- ▶ **Extend coordination with ISO New England** to annually evaluate practical limits to policy implementation and impacts on wholesale market operations in ways consistent with ISO NE's independent role as grid operator.

# Supporting Information

Supporting reports presenting assumptions, data, and modeling approaches used for the examples provided are being completed and will be made available later.

These comments and supporting reports summarize work completed by the author with some assistance from graduate students and other faculty at the University of Massachusetts Lowell. The observations and recommendations presented in this presentation, and in the supporting reports, are solely the views of the author and are not intended to represent the views of the University of Massachusetts or other faculty there.

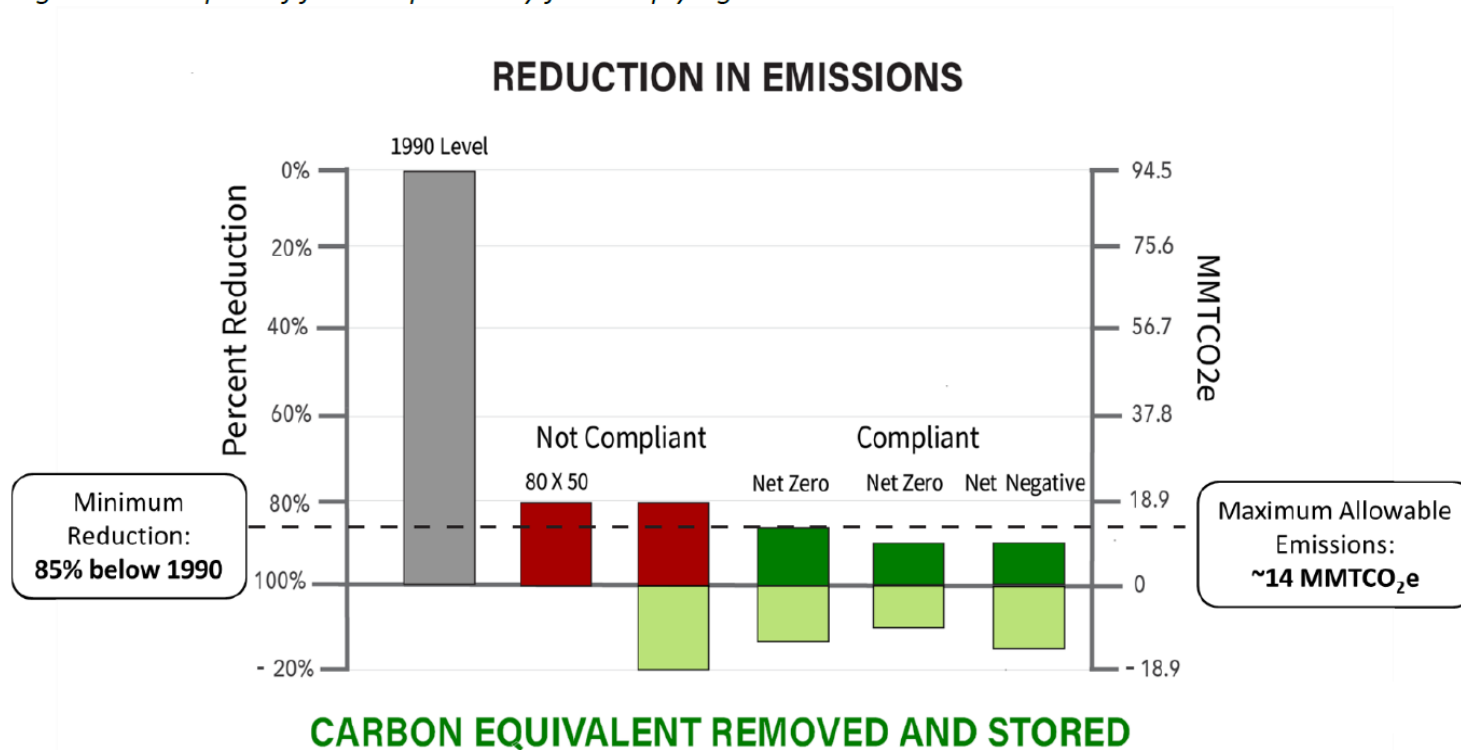
# Excerpts from Climate Plan



# Climate plan targets

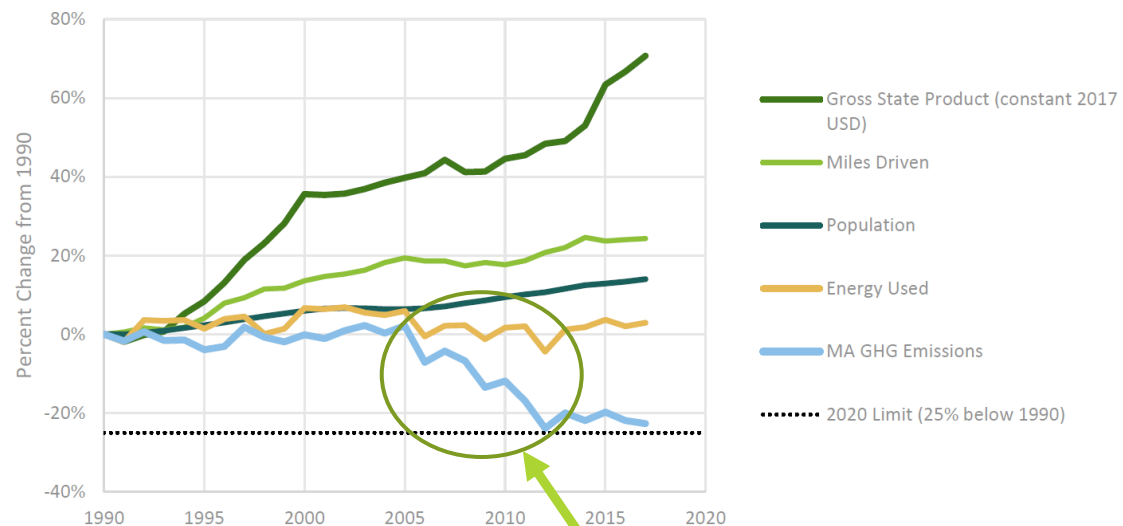
- ▶ Global Warming Solutions Act of 2008 set “ambitious GHG reduction limits”
- ▶ Based on IPCC guidance to avoid extreme impacts of climate change by stabilizing below 1.5 deg C; net-zero global CO2 emissions by 2050
- ▶ “Net-zero” defined as less than 85% below 1990 level, about 14.2 MMTCO<sub>2</sub>e
- ▶ **Need to establish feasibility and cost-effectiveness of planning**

Figure 1. Examples of future optionality for complying with the Net Zero in 2050 limit.



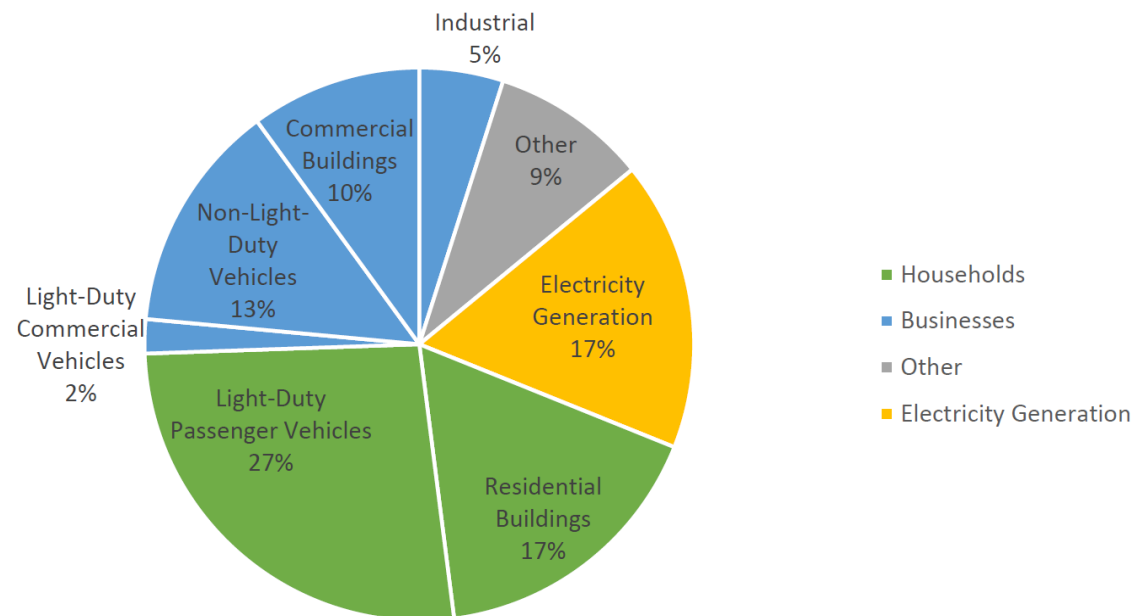
# Decarbonization basis and history

Figure 3: Percentage changes in Gross State Product, vehicle-miles traveled, population, energy usage, and statewide GHG emissions since 1990. Dotted line represents the GWSA 2020 emissions limit of 25% below the 1990 level.



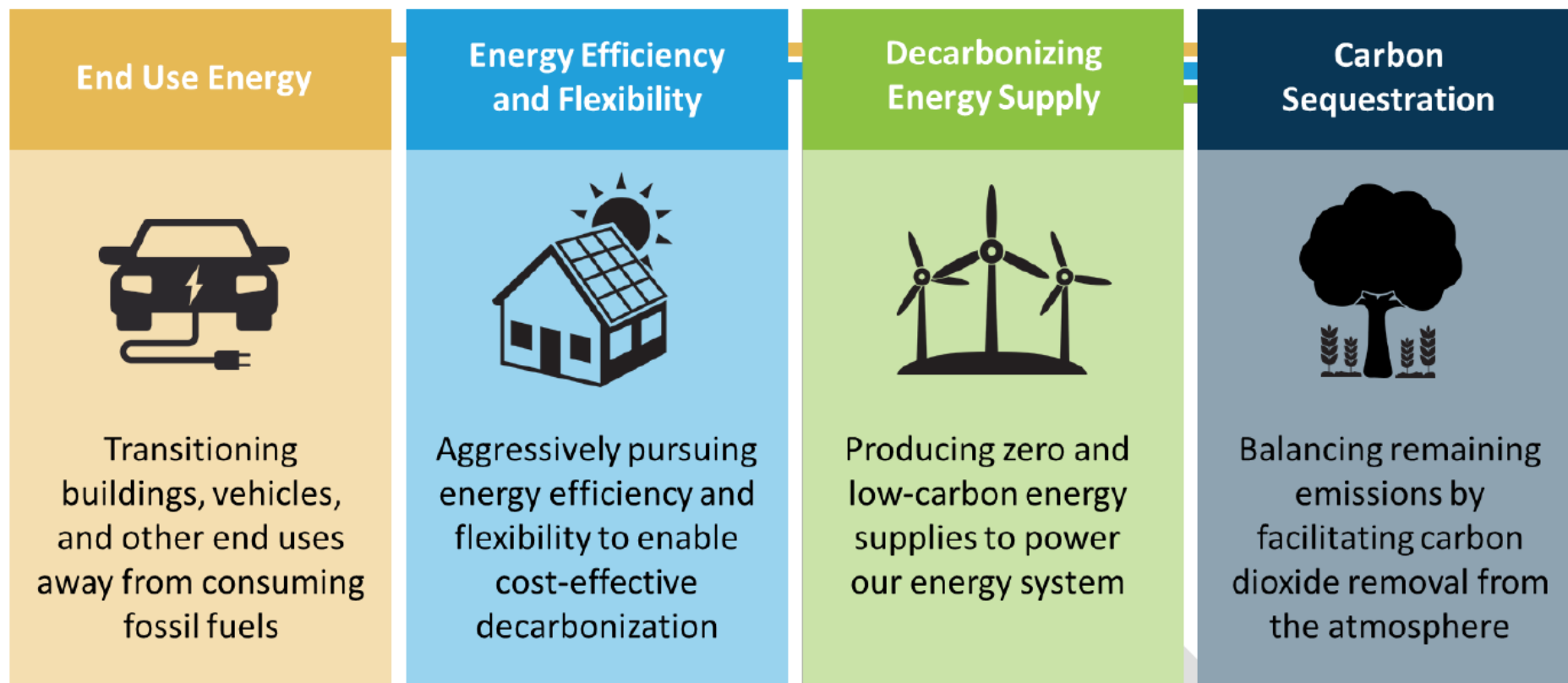
Drop in CO2 due to cheap gas replacing coal and oil use

Figure 4: Distribution of 2017 GHG emission across households, businesses, and other categories.



# How should we get there?

Figure 2. Four key “pillars of decarbonization” to achieve Net Zero in 2050.



# Reductions by 2030

Table 1: Range of GHG reductions estimated for the full and timely implementation of strategies and policy actions outlined in the 2030 CECP.

Sector	Gross GHG Emissions (MMTCO <sub>2e</sub> )			GHG Reductions in 2030 (from 2017)
	1990	2017	2030	
Transportation	30.5	30.5	22.5 - 22.7	7.8 – 8.1
Buildings	23.8	19.7	10.3	9.4
Electricity	28.1	13.6	8.5 - 9.4	4.2 – 5.1
Industrial & Non-Energy	12.0	9.2	7.8 - 9.7	(0.5)* – 1.4
<b>Total</b>	<b>94.5</b>	<b>73.0</b>	<b>49.1 – 52.1</b>	<b>20.9 – 23.9</b>
<b>% Reduction From 1990</b>	-	<b>23%</b>	<b>45% - 48%</b>	

\*Negative reduction indicates an increase – this reflects partial mitigation of emissions growth



THE COMMONWEALTH OF MASSACHUSETTS  
House of Representatives  
24 Beacon Street  
State House, Boston 02113 - 1054

LINDSAY N. SABADOSA  
STATE REPRESENTATIVE  
1ST HAMPSHIRE DISTRICT

**SENT BY EMAIL ONLY**

March 22, 2021

Dear GSWA Advisory Committee ,

I am writing to encourage the Commonwealth to take necessary actions to meet Massachusetts' ambitious climate goals. For this to be achieved, the State must dramatically reduce greenhouse gas emissions, increase protections for our lands and forests, and protect the health of our communities, particularly environmental justice communities that bear the brunt of toxic air pollution. The 2030 CECP falls short of the urgent climate action that is required to get to just and equitable "net-zero" carbon emissions by 2050.

The first area the Commonwealth needs to improve its plan is immediately ceasing the subsidization of burning garbage biomasses, which are false climate solutions. The state's decarbonization strategy falsely assumes that emissions from burning waste products, in particular wood residues, will have zero carbon emissions. Biomass power plants and garbage incinerators emit more carbon dioxide and harmful air pollutants per unit of energy than coal plants and are disproportionately sited in Environmental Justice communities. Letting trees grow, and reducing and recycling our waste, are real climate solutions. Massachusetts must remove woody biomass and garbage incineration from the Alternative Portfolio Standard (APS), the Renewable Portfolio Standard (RPS), the Clean Energy Standard, and the Clean Peak Standard by 2022 and end state subsidies for woody biomass combustion.

The second area to improve upon is our protection of forests here in the Commonwealth. The 2030 CECP fails to provide a coherent and workable plan that will ensure forests will be able to meet the challenge required to achieve carbon neutrality by 2050. Massachusetts should maximize carbon storage on the approximately one million acres of state-owned forest lands by immediately and

permanently protecting them from commercial exploitation and putting them into a Carbon Reserve Program. The plan should also include policies to reduce or eliminate incentives for logging on private forest lands and switch to a carbon-based incentives program to promote forestation through the use of reduced taxation (Chapter 61"C") and enrollment in carbon credit markets that provide non-timber income to property owners. Revise Strategy L3 to promote keeping forests intact and stop promoting more consumptive uses of forests like developing a market for biomass energy and "junk wood," production of cross laminated timber (CLT) and other "durable wood products" that degrade current carbon storage by forests and reduce future potential carbon capture capacity. The best and largest trees that will be targeted for consumptive uses are the very trees that are essential to keep in place as they rapidly increase their carbon removal and storage rates.

Reaching these goals are crucial because of the climate crisis. As a state that is trying to be a leader in the fight against climate change, we must take the most beneficial actions that we can. Not stopping the burning of garbage and biomasses and the failure to protect our forests would not exhibit the kind of leadership Massachusetts is striving for. Thank you for the opportunity to give input on this very important subject and I hope that these initiatives will be strongly considered.

Respectfully,

A handwritten signature in cursive script, appearing to read "Lindsay N. Sabadosa".

Lindsay N. Sabadosa

State Representative, 1st Hampshire



**MASSACHUSETTS**  
ASSOCIATION OF REALTORS®

**STATEMENT OF THE MASSACHUSETTS ASSOCIATION OF REALTORS® AND GREATER BOSTON REAL ESTATE BOARD REGARDING CLEAN ENERGY AND CLIMATE PLAN FOR 2030**

On behalf of the more than 25,000 licensed member professionals of the Massachusetts Association of Realtors® (MAR) and more than 12,000 members of the Greater Boston Real Estate Board (GBREB) we hereby express our concerns regarding the Clean Energy and Climate Plan for 2030 (CECP).

Protecting our environment and promoting energy efficiency is a priority for real estate professionals in Massachusetts. We recognize the importance of the environment to our quality of life and property. Our members are committed to energy efficiency, conservation, and helping to preserve and protect our environment.

Our comments are limited to specific concerns with Chapter 3 Transforming our Buildings. We recognize that many of the details outlined in the CECP may change due to the recent passage of S. 30 *An Act creating a next-generation roadmap for Massachusetts climate policy*.

***Local option stretch energy codes***

This provision allows Green Communities to opt-in to a new, high-performance stretch energy code requiring passive-house level building envelope efficiency starting in 2022.

GBREB and MAR continue to believe that a uniform, statewide building code is fundamental to fostering a stable environment in which existing business can thrive and new development is encouraged. We oppose allowing all 351 communities in Massachusetts to choose by local option, whether or not to adopt building code requirements. This system imposes enormous risk on a developer, without reliable and consistent standards for new construction. Unlike the adoption of the statewide building code, an opt-in system leaves a developer without any way to predict if a code will be adopted.

Local restrictions undermine the market's ability to meet demand and are often used by communities to limit growth generally and more specifically to limit growth to high-cost new single-family homes. It is not unreasonable to assume the same communities that have utilized wetlands bylaws, septic regulations and zoning to stifle the production of housing will see the adoption of local option codes as yet another opportunity to discourage the development of much needed housing.

***Home Energy Scorecard***

The plan calls for the use of a Home Energy Scorecard that has been developed by DOER that works with both the U.S. Department of Energy Home Energy Score designed for existing homes and the Residential Energy Services Network (RESNET) Home Energy Rating System (HERS) ratings. To *“help help inform homeowners and renters alike of the potential improvements in efficiency and GHG reduction opportunities in their homes”*.

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Tel: 617-423-8700 | [www.gbreb.com](http://www.gbreb.com)

18 Washington St. Foxboro, MA 02035  
Tel: 781-890-3700 | [www.marealtor.com](http://www.marealtor.com)

Through a joint legislative alliance GBREB and MAR represents our member's interests with regards to legislative and regulatory issues at the state level.



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GBREB and MAR support a property owner's ability to voluntarily obtain an energy inspection of their home through programs such as MassSave. We also support a buyer's ability to inspect a property before purchase.

The fact is that buyers already have options to learn about the efficiency of a home. Under existing state law, home inspectors are required to provide consumers information regarding home energy audits at the time of a home inspection (see 266 CMR 6.08). Additionally, the standard contract to purchase produced by MAR includes a provision allowing for a buyer to conduct an energy audit as part of the inspection and make the sale contingent on the results of the audit. It is also important to note that many of the energy efficiency issues covered by an energy audit are also covered by the optional, yet widely used, home inspection. Finally, in today's market, energy efficient homes are marketed and promoted as such. These existing alternatives give consumers the choice to voluntarily conduct inspections and they should be able to choose if and when they want to have an energy audit.

### ***Heat Pumps***

We appreciate the recognition that *"There is not a one-size fits-all solution, and not every building in Massachusetts can currently be cost-effectively electrified."* We find this is certainly the case with heat pump system particularly for large commercial or apartment buildings.

There are many commercial applications in which heat pumps are an economical, dependable alternative. But mandating the installation of heat pumps takes away other cost effective and energy efficient options. For example, based on square footage a central cooling plant with new energy efficient chillers such as a magnetic bearing chiller would be more economical than a high rise full of heat pumps.

The coefficient of performance of a heat pump is high, but it cannot be the only deciding factor. The operational costs to the owner of a heat pump system is substantially higher than a central cooling or heating system. We must remain cognizant of the costs that tenants will have to absorb if a building cannot be efficiently electrified.

***Energy reporting and "rental standards" for multifamily housing and commercial buildings.*** The CECP provides for the creation of a Special Commission on Clean Heat and Interagency Task Force on Clean-Heat and includes performance and reporting standards for large commercial and industrial buildings as well as labeling and rental standards as additional issues.

Mandatory energy audit requirements, in effect, question building owners' ability to properly manage their own properties – to identify cost-effective and profitable actions. Additionally, the existing markets already have many mechanisms that voluntarily collect and communicate information about building energy performance, including utility bills; property inspections by potential buyers, renters, or home inspectors; voluntary energy labeling; and building audits, potentially subsidized through energy utility programs. If the intent of the proposed initiative is to make sure that the real estate market is fully informed out energy performance, any new required labeling would, at best, provide incremental information on energy performance beyond these existing market mechanisms.

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Questions remain regarding this policy’s effectiveness as a tool for lowering energy use or that such a mandate will help building owners identify ways to efficiently lower their energy use. An investigation by noted Harvard environmental economist Robert N. Stavins. “An Economic Perspective on Building Labeling Policies,” observed that research on energy labeling programs in the United States “has not addressed questions related to program performance” and that “there currently is no real evidence that these mandatory programs lead to any changes whatsoever in energy use.”

The variation in different sorts of residential property: apartment houses, boarding houses, mixed-use residential, convents and monasteries, dormitories, non-transient hotels, condominiums, time-share properties, residential treatment facilities, nursing homes, etc. present a myriad of complicated issues. Individual property owners and many small business owners may not be equipped to provide the required information and privacy remains a concern. Gas or electric utilities are hesitant to provide information on a tenant’s utility usage to a building owner, nor information on individual condominium owners’ energy usage to the condominium homeowners’ association. Intensive participation by the utilities in training and providing the information is essential.

GBREB and MAR are committed to improving the energy efficiency of our homes, apartments, and buildings. Despite the industry’s willingness to move in this direction, current economic conditions have made this increasingly difficult. Variables such as occupancy rates, debt burden, complex refinancing, and increased pressure on operating expenses have forced owners to do more with less. High upfront costs, capital costs, prolonged payback periods and split incentives remain significant barriers to more energy efficiency. The most beneficial enticements for retrofitting buildings continue to be tax incentives, rebates and discounts on environmental products, grants and reduced permits and zoning fees and other affirmative programs.

We have concerns not only with the economic impact to the business community but to the adverse impact on housing affordability. Placing this burden on a condominium association, affordable apartment building or small business owner will create a large burden on those ill-equipped to address the challenges. Reducing the risk of global climate change through reduced emissions of carbon dioxide and other greenhouse gases is a laudable goal. Massachusetts can and should be proud of the work they have done to voluntarily encourage conservation measures but ratepayers and property owners should not be saddled with a new unfunded mandate .

Thank you for the opportunity to provide feedback. We are happy to make available the technical expertise of our building engineers and multifamily apartment owners who must make these important decisions every day. Please do not hesitate to contact Justin Davidson, General Counsel, MAR, [jdavidson@marealtor.com](mailto:jdavidson@marealtor.com), or Patricia Baumer, Director of Government Affairs, GBREB, [pbaumer@gbreb.com](mailto:pbaumer@gbreb.com) if you have any questions.

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March 22, 2021

Kathleen Theoharides  
Secretary of the Executive Office of Energy and Environmental Affairs  
Commonwealth of Massachusetts  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Dear Secretary Theoharides:

Congratulations on the completion and release of the Commonwealth's Clean Energy and Climate Plan for 2030 and the companion 2050 Decarbonization Roadmap Study.

HQUS is pleased to offer brief comments as it relates to the near term actions necessary to meet the newly established 2030 GHG reduction target -- as well as observations about how the region can make use of Hydro-Québec's system to help achieve the deep decarbonization levels required by 2050.

Hydro-Québec operates an extensive electricity system comprised of multiple large scale, and geographically diverse, hydropower generating facilities capable of producing approximately 200 TWh annually. These facilities are supported by reservoirs capable of instantaneous water release to produce electricity on demand and/or significant water storage for electricity production in future periods. Hydro-Québec's system includes a transmission network to efficiently and reliably supply domestic demand in Québec and deliver large quantities of electricity to external markets such as New England.

**Strategy E1: Execute Current Procurements**

As the 2030 plan discusses, in order to achieve the electricity sector decarbonization goals for 2030, all existing procurements for clean energy and transmission must be completed in a timely fashion. The New England Clean Energy Connect (NECEC) transmission line, which will enable supplies of 9.5 TWh of Hydro-Québec's hydropower, was selected by Massachusetts in the 83D solicitation process in 2018. We are pleased that this project will be making an important contribution to the Commonwealth's 2030 GHG reduction target and trajectory for the 2050 Net Zero requirement. With all federal and state permits received, the NECEC project is under construction in the US, and construction is expected to commence in Québec later this year.

Continued efforts with regional stakeholders towards completion of the project to ensure benefits to Massachusetts, Maine, and the entire region is a top priority for Hydro-Québec. The Commonwealth and its agencies must continue to work with their regional counterparts to ensure that no new roadblocks to achieving the Commonwealth's goals are created.

## **Strategy E2- Develop and Coordinate Regional Planning and Markets**

### **Coordinated procurement**

Given the aggressive, but similarly structured and timed, clean energy and climate mandates of the New England states, consideration should be given to regional procurements that can take advantage of the economies of scale associated with infrastructure development and drive more cost-effective solutions for reaching policy requirements.

The 2030 Plan recognizes that “[r]eliably operating a cost-effective, ultra-low emissions electricity grid based on variable renewable resources requires a balanced portfolio of complementary resources and technologies.”<sup>1</sup> While the 2030 Plan encourages a coordinated regional approach for procurement of offshore wind resources, HQ suggests that Massachusetts go further and open coordinated procurements to all clean resources, including onshore wind, solar, hydropower, and transmission. This would have the added benefit of enabling the Commonwealth and the region to select combinations of complementary resources and resource performance attributes and to procure them as planned and needed in order to achieve a reliable clean energy and transmission portfolio that is optimized to the region's growing needs as electrification develops.

### **Regional Planning for Transmission and Siting**

The 2030 Plan emphasizes the need for significant expansion of high voltage interstate transmission within and beyond Massachusetts and specifically recognizes that “regional cooperation on electricity system planning will be necessary to plan and site new interstate and interregional transmission capacity.” While it is true that “the pace and magnitude of required renewable generation and transmission development outlined in the 2050 Roadmap also indicates the need to make significant changes not only in the pace of federal siting approval, but also in the design and function of the New England electricity markets,” the 2030 Plan should not limit its reform focus to ISO New England's system planning and market design.

Hydro-Québec urges consideration of how state and federal transmission siting processes can be improved and streamlined, including by more closely incorporating a multi-state regional transmission planning process, administered by an independent regional transmission organization operating in a wholesale market environment that meets the states' planning objectives, into state and federal siting review of public convenience and necessity.

The NECEC project is an example that state and federal permits can be achieved and can significantly increase the value of a project for the host state. However, review processes

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<sup>1</sup> 2030 CECP, p. 36.

continue to be uncertain, particularly as it relates to the timing for project approval. Lengthy project review processes that are prone to delay will create significant challenges for reaching the 2050 goals.

Importantly, as Massachusetts and the region consider ways to enhance and expedite the siting process to meet their climate goals, they should also make efforts to protect the process against the ability of participants with commercial interests in the market from intentionally misusing the process to delay and/or block projects. We have seen certain incumbent market competitors take a wide range of actions to stop the NECEC project in order to protect the status quo at the expense of the Commonwealth's policy goals.

### **Achieving 2050 Goals**

Increased transmission is recognized by the Commonwealth as a prerequisite for deep decarbonization and increased system reliability. This includes the use of transmission interconnections with Québec to balance the variable output of renewable resources in New England during low generation periods and to store the output of these resources in Hydro-Québec's reservoir system during high generation periods. Use of transmission capacity in this way is noted as being mutually beneficial as the penetration of renewable energy resources in New England increases significantly over time. In particular, the scale of Québec's abundant hydro and wind resources could complement and maximize offshore wind development in New England. Thus, EEA and its agencies should include planning for development of transmission to enable the use of HQ's system as a balancing resource as part of the planning process to procure, construct, and interconnect additional offshore wind resources between 2030 and 2040<sup>2</sup> and beyond.

Hydro-Québec urges Massachusetts to continue to view transmission investment and integration with Québec for the value and service that it can provide in the near term to deliver large quantities of clean energy and over the long term horizon as part of the balancing strategy of the 2050 Roadmap.

Hydro-Québec looks forward to continued involvement in the various processes to ensure a clean energy transition in the region.

Sincerely,



Stephen C. Molodetz  
Vice President of Business Development  
HQUS

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<sup>2</sup> Strategy E5 envisions planning for 6 GW of additional offshore wind between 2030 and 2040.



## Health and Environmental Effects of Gasoline Leaf Blowers

Lucy Weinstein, MD, MPH

Gasoline-powered landscape equipment, particularly gas leaf blowers (GLBs), poses multiple health and environmental hazards. Growing dependence on gas leaf blowers for cleanup and routine landscape maintenance in NY and elsewhere is exposing people to high levels of exhaust pollutants and noise, causing the re-suspension of dust and particulate matter, and contaminating our water supply.

Gas leaf blowers are primarily 2-stroke engines which have no emissions controls, are inefficient at burning of fuel, and are highly polluting. They have an air jet velocity of 150–280 mph. Growing evidence implicates the 2-stroke engine in particular in increased risks of early death, heart attack, stroke, congestive heart failure, asthma, chronic obstructive pulmonary disease, cancer<sup>1,2,3,4,5</sup>, and other serious health conditions. Workers, children, seniors, and people with chronic illness are at greatest risk. Gasoline lawn and garden equipment accounts for 5%–10% of total US emissions of carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and small particulate matter<sup>6</sup>. A recent report predicts that in a few years, the worst single ozone polluter in California is going to be gas garden equipment.<sup>7</sup> What is particularly insidious about this form of pollution is that it surrounds our homes, schools, and places of work. This translates to near constant exposure.

Proven alternatives – with no additional costs to the landscape professional or homeowner and equal or nearly equal efficiency – include lithium ion battery or other electrical equipment, or rakes and

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<sup>1</sup> Brook R.D., et al.; Expert Panel on Population and Prevention Science of the American Heart Association. Air pollution and cardiovascular disease: a statement for healthcare professionals from the Expert Panel on Population and Prevention Science of the American Heart Association. *Circulation*. 2004;109:2655–2671.

<sup>2</sup> Li S, Williams G, Jalaludin B, et al. Panel studies of air pollution on children's lung function and respiratory symptoms: a literature review. *J Asthma*. 2012 Nov;49(9):895-910.

<sup>3</sup> Mustafic H, Jabre P, Caussin C, et al. Main Air Pollutants and Myocardial Infarction. A Systematic Review and Meta-analysis. *JAMA*. 2012;307:713-721.

<sup>4</sup> Rice MB, Ljungman PL, Wilker EH, et al. Short-term exposure to air pollution and lung function in the Framingham Heart Study. *Am J Respir Crit Care Med*. 2013 Dec 1;188(11):1351-7.

<sup>5</sup> California EPA Air Resources Board: “A Report to the California Legislature on the Potential Health and Environmental Impacts of Leaf Blowers” Feb. 2000

<http://www.arb.ca.gov/msprog/mailouts/msc0005/msc0005.pdf>

<sup>6</sup> Michaels H, US EPA. NONROAD Overview presented at the 2012 International Emission Inventory Conference, 2012. *US EPA 2005 data in* Volckens J, Olson DA, Hays MD. *Atmospheric Environment* 2008;42:1239-48.

<sup>7</sup> California Air Resources Board Study

[http://www.kqed.org/news/story/2017/02/28/227727/california\\_weighs\\_tougher\\_emissions\\_rules\\_for\\_gaspowered\\_garden?source=npr&category=u.s.](http://www.kqed.org/news/story/2017/02/28/227727/california_weighs_tougher_emissions_rules_for_gaspowered_garden?source=npr&category=u.s.)

brooms. Many municipalities in NYS and elsewhere have restricted or banned GLBs without any resultant problems.

The major health and environmental hazards of gas leaf blowers are:

- Exhaust pollution
- Fine particulate pollution
- Noise pollution
- Environmental degradation, including water pollution and small animal habitat destruction

✚ **Exhaust pollutants** released or churned up the GLBs include volatile organic compounds (VOCs) - Benzene, 1,3 butadiene, acetaldehyde, and formaldehyde. These are HAPS: Hazardous Air Pollutants (defined by the US EPA as pollutants that cause or may cause cancer or other serious health effects.)<sup>8</sup> Also released are nitrogen oxides, carbon monoxide, particulate matter, and carbon dioxide, which are considered “Criteria Pollutants” (harmful to public health and the environment).<sup>9,10</sup> Even low level exposures have been associated with respiratory and central nervous system effects. GLB pollutants such as hydrocarbon vapors, nitrogen oxides, and carbon monoxide react in the presence of heat and sunlight to form ground-level ozone, the major component of smog, and a known respiratory irritant and risk factor for cardiovascular disease.<sup>11</sup>

✚ **Fine particulate matter** (under 2.5 microns, which is easily assimilated in the lungs) has been linked to all-cause premature death, myocardial infarctions, anxiety, strokes, CHF, and respiratory disease – including asthma attacks - and can increase the severity of chronic lung disease in the elderly. A recent study implicates particulates and exhaust pollutants of the type released by GLBGs in an increased risk of dementia. <sup>12</sup>2-stroke engines account for the vast majority of fine particulate pollution in landscape maintenance. <sup>13,14,15,16</sup> Particulate matter may contain animal fecal matter, fertilizers, pesticides, herbicides, allergens (fungal spores, pollen), diesel soot, brake dust, rubber tire particles, and/or heavy metals or other toxins (e.g. arsenic, chromium, lead, mercury). Combustion exhaust particulate matter remains suspended in the air for hours or even days.

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<sup>8</sup> <http://www.epa.gov/ttn/atw/pollsour.html> and <http://www3.epa.gov/ttn/atw/orig189.html>

<sup>9</sup> Regulated by National Ambient Air Quality Standards established by the EPA. See <http://www.epa.gov/air/criteria.html>

<sup>10</sup> Volckens J, Olson DA, Hays MD. “Carbonaceous Species Emitted from Handheld Two-Stroke Engines,” *Atmospheric Environment* 2008;42:1239-1248.

<sup>11</sup> <http://www3.epa.gov/ozonepollution/health.html>

<sup>12</sup> <http://www.medscape.com/viewarticle/874069>

<sup>13</sup> US EPA 2012 study: *Provisional Assessment of Recent Studies on Health Effects of Particulate Matter Exposure*, EPA/600/R-12/056F, December 2012.

<sup>14</sup> Banks, J. and McConnell, J. National Lawn and Garden Equipment Emissions; presented at EPA’s 2015 International Emissions Inventory Conference, San Diego, CA April 16, 2015

<sup>15</sup> American Lung Association: State of the Air 2015

[http://www.stateoftheair.org/2015/assets/ALA\\_State\\_of\\_the\\_Air\\_2015.pdf](http://www.stateoftheair.org/2015/assets/ALA_State_of_the_Air_2015.pdf)

<sup>16</sup> Power M et al: *The relation between past exposure to fine particulate air pollution and prevalent anxiety: observational cohort study*, *BMJ* 2015;350:h1111. <http://www.medscape.com/viewarticle/842093?src=emailthis>

- ✚ **Noise** from older leaf blowers ranges from 95–115 decibels at the ear of the operator. (Some newer ones are slightly quieter). These levels are orders of magnitude -decibels are on a logarithmic scale - beyond those deemed safe by OSHA and NIOSH for workers and the public<sup>17</sup>. Noise is more than just an annoyance; exposure to constant or high levels of noise can cause countless adverse health effects. These include stress-related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity. The EPA states that “noise degrades quality of life by impairing communication and social interaction; reducing the accuracy of work, particularly complex tasks; and creating stressful levels of frustration and aggravation that last even when the noise has ceased.”<sup>18,19</sup>
- ✚ **Environmental degradation**
  - The high velocity air jets of leaf blowers – 150-280 mph – can destroy nests and small animal habitats; desiccate pollen, sap, and other natural plant substances; and injure or destroy birds, small mammals, and beneficial insects. High chronic noise levels decrease biodiversity in affected areas.<sup>20,21</sup>
  - Leaf blowers damage plants, remove beneficial topsoil and mulch, desiccate and compact soil, diminish plant health and contribute to the spread of invasives. This increases dependence on use of fertilizers, herbicides and pesticides.
  - Landscape workers or homeowners frequently blow debris into roads, where, according to the Suffolk County Water Authority, it can enter storm drains and end up polluting our waters.<sup>22</sup>

In summary, “Gasoline lawn and garden equipment (GLGE) is an important source of toxic and carcinogenic exhaust and fine particulate matter. Improved reporting and monitoring of localized GLGE emissions should be implemented. Medical and scientific organizations should increase public awareness of GLGE and landscape maintenance equipment (GLME) and identify GLGE as an important local source of dangerous air pollutants. Communities and environmental, public health, and other government agencies should create policies and programs to protect the public from GLGE air pollutants and promote non-polluting alternatives.”<sup>23</sup>

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<sup>17</sup> Fink D. 2017. What Is a Safe Noise Level for the Public? AmJPH January 2017: Vol. 107, No. 1, pp. 44-45. <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2016.303527>

<sup>18</sup> <http://www.epa.gov/clean-air-act-overview/title-iv-noise-pollution>

<sup>19</sup> American Public Health Association; Noise Pollution Policy Statement <http://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/16/12/50/environmental-noise-pollution-control>

<sup>20</sup> [file:///C:/Users/lucy/Downloads/10048\\_NO0235\\_PublishedReport.pdf](file:///C:/Users/lucy/Downloads/10048_NO0235_PublishedReport.pdf)

<sup>21</sup> Barber, J. R., Crooks, K. R., & Fristrup, K. M. 2010. The costs of chronic noise exposure for terrestrial organisms. Trends in Ecology and Evolution, 25(3), 180-189 [https://www.nps.gov/subjects/sound/upload/Wildlife\\_AnnotatedBiblio\\_Aug2011.pdf](https://www.nps.gov/subjects/sound/upload/Wildlife_AnnotatedBiblio_Aug2011.pdf)

<sup>22</sup> “Leaf Blowers Blow More than Just Leaves” Suffolk County Water Authority Notice 2015 [http://www.scwa.com/press/leaf\\_blowers/](http://www.scwa.com/press/leaf_blowers/)

<sup>23</sup> Banks, J. and McConnell, J. National Lawn and Garden Equipment Emissions; presented at EPA 2015 International Emissions Inventory Conference, San Diego, CA April 16, 2015



## **Comments of the Solar Energy Business Association of New England on the Massachusetts Clean Energy and Climate Plan 2030**

**March 22, 2021**

The Solar Energy Business Association of New England (“SEBANE”) thanks the Executive Office of Energy and Environmental Affairs (“EEA”) for engaging residents and businesses to comment on the Massachusetts Clean Energy and Climate Plan 2030. SEBANE is a 501(c)6 trade association representing over 80 member companies including residential and commercial installers, Independent Power Producers, and Law Groups. In addition to more detailed comments submitted by individual member companies, SEBANE would like to submit comments specific to the Energy Pathways to Deep Decarbonization Technical Report, Section 6.3.2.

### **Section 6.3.2 Build Rates**

In their September 2019 report, “Achieving 80% GHG Reductions in New England by 2050”, Brattle Group found that the current pace of adding solar in our region is wholly insufficient to meet emission reduction targets, and recommends a build rate of 1GW of solar per year for the State of Massachusetts. Now that emission reduction targets are slated to increase significantly following the likely passage of Climate Bill S-9, SEBANE believes that Brattle Group’s recommendation may actually be conservative. We believe that the role of solar is critical in helping the State meet its goals.

However, the current draft of the Massachusetts Clean Energy and Climate Plan 2030 represents solar as a small fraction of average annual build rates (Figure 40 on Page 89 of the Energy Pathways technical report), and erroneously asserts that “build rates for solar... will be especially difficult to achieve and imply both societal and technological breakthroughs.”

SEBANE believes that this statement is highly inaccurate. Solar energy is the most readily deployable clean energy resource available, and the opportunities within Massachusetts for greatly expanding solar deployment are vast. Furthermore, when coupled with energy storage and properly configured and dispatched, solar can be relied upon as baseload power.

SEBANE strongly urges EEA to consider the Brattle Group’s recommendation of 1GW of solar per year as a more reasonable annual build rate for the State. SEBANE also urges EEA to correct Figure 40 and the text on page 89 to accurately represent the full potential of solar power—especially since the build rate listed in Figure 40 will have outsized influence in shaping the next 20 years of the state’s solar industry

Thank you for your consideration,  
Mark Sylvia, President  
Solar Energy Business Association of New England (SEBANE)



## **Comments from The Nature Conservancy on the draft 2030 Clean Energy and Climate Plan, submitted via the online portal on March 22, 2021**

### **Chapter 2: Transforming our Transportation Systems**

#### **T1: Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions**

TNC supports clean transportation investments to improve mobility, address equity, and reduce pollution. As the Commonwealth has been leading the regional effort to adopt the Transportation and Climate Initiative (TCI), we request that the Commonwealth prioritize investments in communities that suffer disproportionately from transportation pollution or lack access to mobility options.

After consulting in early 2018 with partner organizations and state agencies involved in the TCI process, The Conservancy identified a need to address a gap in knowledge and research on the transportation needs of rural communities and the solutions that might work best. People in rural areas are often overlooked in discussions about clean transportation investments, at least in part because there are fewer people and fewer emissions coming from these areas.

The 2020 report “Supporting Rural Communities Through Clean Transportation Investments,” researched and written by EBP at the request of The Nature Conservancy, looked at a variety of potential transportation improvements that could be available in rural and small-town communities and examines their potential ability to provide a range of benefits. These benefits include not only reductions in emissions that cause climate change, but also other important factors, such as stimulating economic growth, public health and safety improvements, access to reliable transportation, improving equity, and increasing resilience. We request that EEA use the report as a guide when considering investments for rural communities in: encouraging adoption of new and cleaner vehicle technologies for personal transportation; converting public vehicle fleets to electric or hybrid electric technologies; enabling conversion of freight vehicles that pass through the region to electric technologies; electrification of rural truck stops; facilitating increased use of rail and marine routes for freight transport; improving intra-regional and local rural public transportation and shared mobility options in rural areas, inter-regional transportation in rural areas, and access to broadband internet in rural areas; and town centers in small towns.

Of course, rural communities are not the only important constituency that must be considered for policy improvements in the TCI process—or in any dialogue about a cleaner and more just transportation future. The transportation needs in urban communities are significant and complex, and the gains that can be made in terms of clean air, quality of life, equity, and economic growth cannot be understated. Underserved and overburdened residents in urban and suburban areas need the significant emissions reductions and access to clean, reliable transportation options that can be realized if we make good policy choices. We, therefore, support investments in improved public transit, walking and biking infrastructure, and other projects to support transportation justice and cleaner air.

The conversation about modernizing our transportation system needs to be broad and should be inclusive of all communities in a just and equitable manner. And we urge representation of overburdened and underserved communities from across the Commonwealth on advisory boards that will shape policy implementation and inform investment decisions.

#### T6: The Commonwealth will continue to encourage and incentivize a broad range of Smart Growth policies

We appreciate the Commonwealth's approach to Smart Growth policies. We suggest that EEA add some additional specificity to help create cross-cutting linkages among smart growth strategies and other CECP strategies. For example, provide for an integrated approach across all EEA agency programs that either requires or incentivizes adoption of smart growth for continued qualification as a Municipal Vulnerability Preparedness community, Green Community, and other existing grant programs. This could include: creating incentives for reforming local ordinances, bylaws, and permitting processes such as Open Space Residential Design, Natural Resource Protection, and Transfer of Development Rights; incorporating nature-based solutions into design requirements in subdivision regulations and site plan review; and tree retention ordinances with unavoidable tree removals requiring payments into a local mitigation fund for tree planting.

### **Chapter 4: Transforming our Energy Supply**

#### E4: Continue to Deploy Solar in Massachusetts

Given the CECP's forecasted need for significant development of land and forest resources for ground-mounted solar development, we request the maintenance, review, and improvements to the SMART program, which currently uses spatial data to incentivize solar facilities in a way that expands solar electricity generation while reducing the impacts on intact and important natural areas, specifically resilient and biodiverse habitat and carbon-rich forests and wetlands. We request that the Department of Energy Resources (DOER):

- Produce a comprehensive and long-range plan for solar development in Massachusetts, including a statewide, stakeholder-engaged, spatially specific analysis that identifies opportunities to achieve solar energy targets and minimize impacts to natural resource and other values.
- Design solar incentives powerful enough to steer solar development to brownfields and other developed areas.
- Collect and assess robust spatial data on the location, size, and resource impacts of SMART projects already developed through the SMART program, those qualified and not yet built, and all future projects.

## E5: Develop and Mature Offshore Wind Industry in Massachusetts

Since Massachusetts initiated the first contracting process for offshore wind, many other states have followed our lead; however, those states have gone a step further than Massachusetts in enhancing their emphasis on environmental protections to avoid, minimize, or mitigate adverse impacts, as well as considering impacts on and inclusion of environmental justice communities in the process. We suggest that the CECP emphasize that avoiding, minimizing, and mitigating environmental impacts will occur to the greatest extent possible in every step of the process, from siting to procurement, to construction, operation, and decommissioning. We encourage the Commonwealth to identify and include in RFPs the highest environmental standards and practices, in alignment with neighboring states.

In addition, we appreciate the emphasis placed on onshore siting and transmission upgrades in the text and suggest that a specific bulleted “strategy action” be added to commit to coordinating across the region with the federal government, other states and offshore wind developers to provide landing and transmission capacity for wind resources. The process of upgrading the regional grid is highly complex and will require cooperation and investment by many interests outside of EEA.

## **Chapter 6: Protecting Our Natural and Working Lands**

### L1: Protect Natural and Working Lands

We have some specific recommendations related to the “Strategy Actions” in this section, as well as suggested additional actions that should be included in this strategy.

#### **Strategy Action: No Net Loss of Forest and Farmland**

We appreciate the inclusion of No Net Loss (through smart growth, conservation, and restoration) as recommended as a strategy by the Resilient Lands Initiative (RLI) – in which the Conservancy participated. We believe the proposed No Net Loss strategy would be strengthened if EEA would:

- Set goal/baseline: Acreage goal for protected land and a baseline figure at which to 'set' and track no net loss, such as: forest and farms saved from development; best remaining water supply and habitat protected; and, most intact landscapes protected.
- Measure outcomes: Measure and report land use conversion and trends in greenhouse gas inventories, such as the carbon loss from deforestation, including trends in Environmental Justice communities that impact urban tree canopy cover as well as urban tree loss.
- Prioritize Environmental Justice: Policies and programs should include priority set-asides for: 1) conserving land near Environmental Justice communities and water supply lands; 2) maintaining mature urban tree canopy; and, 3) conserving large, interconnected forests (which contain the highest carbon).

- Adopt the mitigation hierarchy: The CECP should highlight and express the goal of aligning policy and funding to follow the hierarchy of: protect, manage, and restore natural and working lands: Protection is the base of the hierarchy and the preferred action because a portion of the carbon lost when we lose natural and working lands is essentially irrecoverable carbon and cannot be regained even with intensive management or expensive restoration.
- Support and enhance existing programs: Establish goals for funding and investment that continue and enhance existing state land protection, restoration, landowner incentives and conservation assistance programs. Be specific about existing programs, including raising the annual cap on the Conservation Land Tax Credit, investing in existing land conservation and restoration programs, etc. Suggest adding carbon as a criterion in the evaluation of state conservation programs.
- Create guidance tools: Create a spatial decision support tool to calculate net losses and gains, to quantify impacts and benefits, and to guide decision-making at all scales and across land use types, communities, and geographies.
- Promulgate regulatory requirements: Go beyond providing incentives and promulgate regulatory requirements. For example, the Massachusetts Environmental Policy Act (MEPA), currently under revision, should be revised to avoid, minimize, and mitigate land use conversion. To further protect forests in all geographies, add tree removal as a mandatory threshold under MEPA for an Environmental Impact Review, for trees of a size, to be determined by geography.
- Enact new legal authority: New, more robust statute should be enacted to protect the farms and forests identified using a science-based prioritization methodology.

**Strategy Action: Protect and Restore Inland and Coastal Wetlands (Blue Carbon)**

We appreciate the inclusion of blue carbon systems in the CECP. These ecosystems cover a small amount of area, but because they store decades to hundreds of years of stored carbon in sediments, degradation or loss of blue carbon systems has an outsized impact on the Commonwealth’s carbon inventory.

Currently, the CECP calls for “maintaining protections” for blue carbon systems. Unfortunately, current protections are not sufficient to prevent the degradation and even outright loss of salt marshes and eelgrass beds. More than “maintenance” is required. Only by addressing nutrient and pollutant export from stormwater and wastewater will we prevent blue carbon ecosystem degradation and loss from pollution across our coastal watersheds. We recommend:

- Using the Massachusetts Wetlands Protection Act regulations to reduce climate change impacts by reflecting future climate change projections (sea level rise, shifting temperatures, changing precipitation projections).
- Revising standards and requirements for Nutrient Sensitive Areas, MS4 requirements, and CSO requirements to reverse current and prevent future nutrient pollution and alteration of these systems.

- Encouraging and incentivizing adoption of onsite decentralized wastewater management and septic systems that reduce pollutants to the maximum extent practicable.
- Enhancing the Massachusetts Department of Environmental Protection’s programs that assist municipalities in reducing upstream pollution from nitrogen and sediment that can degrade blue carbon systems by providing funding and technical assistance to municipalities, sharing successes from other municipalities, and encouraging protection of natural buffers along coasts and rivers to filter pollutants.
- Increasing restoration efforts to secure existing blue carbon stocks and improve the ability of blue carbon systems to sequester carbon. Provide additional funding for the Division of Ecological Restoration and Office of Coastal Zone Management, directed towards restoration projects that have the biggest carbon sequestration and storage benefits. Explore the potential for carbon credits using the Verified Carbon Standard methodology for tidal wetland and seagrass restoration.
- Allocate a portion of state funds to increase wetlands in EJ populations and in urban communities, which experience disproportionately high heat island effect.

**Suggested Additional Strategy Action: Promote Nature-Based Solutions**

Nature-based solutions (NBS) are ways for communities to enhance safety and avoid costs by protecting, restoring, and managing ecosystems to reduce risks to communities from natural hazards, such as flooding, heat, and drought. Many Massachusetts programs support efforts to repair (“right-size”) functional or remove obsolete infrastructure, such as culverts, small bridges, seawalls and dams, across the state that are deteriorating and are vulnerable to being washed out by severe storms and flooding. These efforts both create jobs and help build more resilient communities. We suggest the CECP include the following to promote the use of NBS:

- Wherever possible, use blue carbon systems, inland wetlands, and floodplains, or use a mix of green and gray infrastructure, rather than building gray infrastructure to reduce risk from floods and storms.
- Ensure that state permitting processes encourage consideration of NBS by requiring or requesting a description of NBS alternatives considered for projects during MEPA review as appropriate. Work to streamline permitting processes for NBS projects.
- Ensure that NBS, blue carbon creation, and maintenance jobs go to residents of EJ populations. Create and maintain job training and workforce development opportunities for residents of EJ populations.
- Create incentives for reforming local ordinances, bylaws, and permitting processes to ensure no net loss of ecosystem services through protection and maximization of green infrastructure/NBS in all new and redevelopment. For example, consider encouraging zoning measures such as: Open Space Residential Design, Natural Resource Protection Zoning by right, Transfer of Development Rights.

## **Suggested Additional Strategy Action: Reforestation**

Although recommended by the IAC, strategies related urban trees or reforestation are missing from the CECP. One of the largest opportunities for carbon drawdown in Massachusetts is reforestation. Reforestation is the act of returning trees to an area that used to be forest but is no longer forested. This can include active planting of trees or changing management or soil conditions to allow trees to naturally reforest an area. Reforestation provides carbon benefits while also helping to manage stormwater and floodwaters, restore wildlife habitat, and improve soil health. We strongly recommend these strategies be added to the plan and called out as a “Strategy Action” in this section, or section L2.

The state should set an audacious goal to plant a specific number of urban and suburban trees by a certain date, with a focus on environmental justice communities, and along rivers, streams, and meadows. The CECP should support such an initiative, including:

- Set numeric goals for urban greening and reforestation, such as: acres of tree canopy saved; acres of new urban greenspace created; miles of river banks planted; acres of new urban habitat in greenways in environmental justice communities; and/or acres of pavement restored to green.
- Collect additional data on urban trees, where losses occur, and the types of development that are associated with loss.
- Support communities in adopting tree retention ordinances, with unavoidable tree removals requiring payments into a local fund for tree planting.
- Educate landowners about natural reforestation of lawns and landscapes, which is a relatively low-cost strategy; however, it requires both planning and stewardship. The recent Massachusetts Healthy Soils Action Plan lists the addition of trees and shrubs to turfgrass and lawns as one of its top recommendations for increasing soil health in developed landscapes.
- Increase the pace of city tree planting programs. Plant large trees in areas that remain non-forested (sidewalks, medians, etc.). Retain existing city trees and set targets for planting new trees and for survival of planted trees in Environmental Justice communities, all 26 Gateway Cities, and other urban centers. Prioritize the siting of trees where they will reduce heat island effects and lower the heating and cooling energy needs of nearby buildings and to absorb stormwater. City trees have considerable local benefits, including reduced energy use in nearby buildings, reduction in the heat island effect, better control of stormwater, improved air quality, and cardiac and mental health benefits.

The CECP should also include strategies to promote tree planting in rural and suburban areas to support both mitigation and adaptation outcomes, such as:

- Invest in active reforestation of streambanks and floodplains. When the highly productive soils in riparian areas are reforested, they tend to lead to faster and greater carbon benefits than upland soils. The benefits to water quality, such as reducing streambank erosion and preventing fertilizer and other pollutants from entering drinking water supplies, are also well worth the investment. Of the ~260,000 acres of reforestation opportunity in Massachusetts, almost 24,000 acres are on

lands that are frequently flooded (data available at [www.reforestationhub.org](http://www.reforestationhub.org)). Programs such as the Natural Resource Conservation Service cost-share programs provide one potential funding source for active reforestation (tree planting) in these areas. State funding, such as through wildlife habitat grants, and aquatic restoration grants, should also be expanded to support riparian reforestation.

## L2: Manage for Ecosystem Health and Enhanced Carbon Sequestration

### **Strategy Action: Implement Incentives and Best Management Practices**

To further strengthen this section, we recommend adding a priority action to provide additional rebates, or ecosystem service payments, to landowners/managers who manage or restore lands in ways that store more carbon on the land and in usable products over the medium term (through 2050). For example, the CECP could recommend adding incentives to the chapter 61 program for landowners who implement the carbon-beneficial management practices developed by stakeholders as part of the Family Forest Carbon Program and Mohawk Trail Woodland Partnership pilot of the Forest Resilience Program. To make this program accessible to as many landowners as possible, we recommend using a fixed rate of payment for different land classes, or for each management practice, to decrease the bureaucratic load on landowners.

### **Strategy Action: Additional Forest Carbon Research**

EEA should put research in perspective relative to the opportunities to take “No Regrets” actions. The scope of EEA’s evaluation of carbon flux was limited in the RoadMap to two aspects of forests. EEA rightly focused on forests, the most significant means of sequestration and carbon storage. However, EEA should be clear in the CECP on what it did and did not evaluate, such as other aspects of forests, soils, wetlands, and salt marshes. Although the CECP states that additional analyses will be commissioned, it should include a clear rationale for what additional analyses of natural and working lands carbon are needed, when they will be done, and how the results of analysis will directly inform action. We also recommend that additional analyses go beyond just forest management and fill any lingering data gaps related to wetlands, soils, salt marshes etc. that might be necessary to advancing natural and working lands carbon. EEA should place these evaluations in context relative to each other in terms of the amount of potential sequestration, storage, and emissions.

## L3: Incentivize Regional Manufacture and Use of Durable Wood Products

The CECP unfortunately does not account for the embodied carbon in steel and concrete within the building sector. However, we appreciate that this section of chapter 6 makes the connection between the building sector and the use of sustainably harvested wood, and the carbon benefits of substituting wood for more carbon-intensive traditional building materials.

We suggest that the CECP get much more specific than to “continue exploring opportunities” to incentivize the use of sustainably harvested wood. For example, the CECP could:

- Recommend enforcement of existing procurement policies, or expansion of those policies, to require the use of local wood when available.
- Suggest that EEA use a quantitative measure of embodied carbon for all building materials for state-funded construction, similar to California’s “Buy Clean California Act.” Such a policy would set a maximum global warming potential for building materials eligible to be used in state projects, whether wood, concrete, steel, or other products.
- Refer to the ongoing Regional Dialogue on Incentivizing Mass Timber to Reduce Climate Change for additional recommendations for ways to incentivize the manufacture and use of wood building products in our region.

L4: Develop Sequestration Accounting and Market Frameworks

**Strategy Action: Develop the measurement, accounting, and market frameworks necessary to support development of a regional carbon sequestration offset market**

Massachusetts should be commended as one of four states to adopt Net Zero. However, this relatively new policy territory requires caution, due diligence, and care to avoid unintended consequences. The Commonwealth’s goal of "gross" emissions reductions reflects the need for first achieving deep greenhouse gas emissions reductions across all sectors, before considering ways to absorb or offset the remaining unavoidable greenhouse gas emissions (again, across all sectors, including land). Any consideration of using increases in the amount of carbon sequestered by lands to offset emissions from other sectors needs to establish requirements that *avoid unintended consequences*, such as allowing more pollution in underserved and overburdened communities. Stakeholders should help develop:

- Requirements and ranking criteria relating to additionality, verification, leakage, permanence, and co-benefits;
- Safeguards to prevent additional harm and provide benefits to environmental justice and vulnerable communities;
- Preferential criteria – offsets that have both climate mitigation and adaptation benefits should receive preference for funding; and
- Prioritization of MA-based activities for offset that address unintended consequences and keep benefits local.

Offsets require a higher standard of additionality than climate action outside of an offset framework. Because offsets enable carbon pollution elsewhere, it is important to be more conservative, precise, and transparent when measuring carbon credits sold in an offset market, versus carbon tons included in a state-wide inventory. Regional cooperation will be important, and Massachusetts might consider what carbon pools it wants to keep out of the private offset markets to ensure that those can eventually be counted in a net-zero framework or a regulatory offset market.



Developing sequestration accounting and market frameworks is challenging, but many other countries and regions have already done so. We urge EEA and the Massachusetts Department of Environmental Protection to use best management practices aligned with international standards of carbon accounting and inventories, for example by considering the resources, principles, and lessons learned in the “Natural Climate Solutions Handbook” and the IPCC and other international reports listed within. This guide for countries considering natural climate solutions within their national climate commitments will be published next month at [nature4climate.org](http://nature4climate.org).

**Strategy Action: Inter-agency Carbon Sequestration Task Force**

EEA missed an opportunity to engage the public regarding carbon sequestration measures, accounting, and frameworks during the process of issuing the Letter of Determination for Net Zero and development of the CECP. The Conservancy recommends that EEA convene a robust stakeholder process, including groups far broader than the IAC and its work groups. It is essential that EEA provide a public process as these issues relate to the transparency and accountability regarding the place that natural and working lands accounting fit within the Net Zero Framework.

In addition, as an offsets framework is developed, we urge EEA to convene a robust stakeholder process to consider offsets in the context of other emissions sources and especially to ensure representation of environmental justice communities. Without early and genuine representation, we risk creating a regional market that allows pollution in underserved communities while concentrating funding and non-carbon benefits elsewhere.

**Strategy Action: Update the statewide biogenic emissions inventory**

Please see the memo from conservation and environmental NGOs provided to EEA in July of 2020. In summary: EEA should commit to a start date and a projected business as usual scenario. Establishing a baseline is as important for the natural and working lands sector as it is for other sectors in the Global Warming Solutions Act because it allows us to monitor changes in carbon emissions and removals in order to understand return on investment, and measure progress towards our carbon goals. If the chosen start date is different than 1990 (the baseline year for the other sectors under the Global Warming Solutions Act), then the state needs to provide a transparent and comprehensive explanation for the different start date.

**Thank you for the opportunity to provide the above comments. Should there be any questions, please do not hesitate to reach out to Steve Long, Director of Government Relations at [slong@tnc.org](mailto:slong@tnc.org).**

Kathleen A. Theoharides  
Secretary of Energy and Environmental Affairs

Re: Comment on Draft Climate Action Plan

Dear Secretary Theoharides,

I write to urge that you substantially strengthen the climate action plan so that it is commensurate with the immense scale of the problems we are facing from transportation emissions: on the global scale in terms of greenhouse gas emissions, at the local scale in terms of the damage to human health of urban residents, in particular to lower income people.

The draft plan calls for the 2050 target year to be brought closer to 2030, a movement in the right direction. But to be effective, there need to be target years beginning in 3 years (2024), monitored at least every 2 years thereafter. This conceptual change would guide both implementation and strategy changes, if necessary.

As many have noted, climate change is an existential challenge we are facing as a planet. A challenge so vast requires a sense of urgency and a scale of action that is lacking in this draft plan.

I expected to see in this plan some of the very good initiatives of the Baker administration, with additional detail and accelerated timetable, and an effort at quantifying the hoped for results, and a means of monitoring the actual results in the environment over time.

First and foremost, the TCI which the Governor and you have promoted effectively should be a primary thrust of the plan. This is an action that Massachusetts has the power to initiate without further legislative or national approval. While the reasonable objective is to convince many Northeast states to implement this strategy together, it has always been clear that Massachusetts might take action itself to jump start the process, and lead by example. Why isn't an action plan for TCI, with a defined timetable and prediction of results the primary element of the plan?

Secondly, the governor has laudably promoted the construction of denser transit oriented housing. Why isn't there a major element of the plan with a timetable, goals, and measurable results from changes in land use density?

Thirdly, the Governor's commission on the future of transportation proposed to shift commuting from single person autos to public transportation, and last year the legislature authorized significant new transit investments. Why aren't these investments integrated into a land use and transportation integrated plan to capture the synergy of land use policy in concert with transit improvements to produce a process to support economic growth with substantially less use of autos?

Fourthly, the state has been working on an environmental impact statement on the replacement of the structurally and functionally deficient I 90 turnpike viaduct in Allston, combined with introduction of enhanced regional rail to transform the western corridor. The construction to replace the deficient viaduct will disrupt auto commuting in the corridor for a decade, and there is strong public insistence that substantial impro-

vement in rail and bus service be combined with the construction to help commuters cope with the construction impact. This is a major opportunity to change modal share to reduce auto use, increase public transportation use, and increase accessibility. Why isn't there a commitment to proceed energetically with this necessary project, and use it as a pilot for how to transform commuting patterns to a more sustainable approach? Congestion reduction is not only compatible with a climate change plan, it is a necessary component of such a plan, and it is primarily within the control of the state government to deliver.

Instead, the proposed plan relies almost totally on elements not within the power of state government to implement, especially the conversion of the vehicular fleet to electric power, which has major challenges, and is not within the power of the state government to affect significantly.

## Federal Preemption

The draft plan relies almost exclusively on changing the fleet of autos and trucks circulating in Massachusetts to substantially increase the proportion of Electric Vehicles. However, because the characteristics of autos and trucks are regulated by the federal government, the plan actually proposes very little action by state government and state agencies.

The federal regulation of the vehicle fleet is primarily through the CAFE standards, initially adopted in the 1970s, as a compromise with the auto industry to provide incentive to the to produce more efficient autos than the industry processes

were organized to produce. But the term Corporate Average Fleet Efficiency needs to be considered carefully. The word “average” means that for every fuel efficient new vehicle sold, the corporation is also entitled to sell a very inefficient vehicle.

This might have once been a useful strategy to “nudge” auto producers to begin to produce and market more fuel efficient vehicles, but as an ongoing matter, it produces an ever growing fleet of fuel inefficient vehicles as a side effect of selling fuel efficient vehicles.

For the climate, it is not the AVERAGE fuel consumption or pollution production generated by vehicles that matters, but the TOTAL, so for CAFE standards to be effective at reducing greenhouse gas generation, the standards need to continually increase in requiring fuel and pollution per mile to go down.

Still worse, in a further compromise with the auto industry, “light trucks” were held to less stringent mileage requirements, so an entire class of popular vehicles are not significantly weighted in the averaging process. Further exacerbating this loophole, SUVs are considered as light trucks, so the very vehicles that the industry promotes in their advertising and that consumers increasingly prefer are becoming an ever greater portion of the vehicle fleet.

A further problem is that the new vehicles sold each year are only a small part of the number of vehicles circulating on the roadway system. The current vehicles with their fuel consumption and pollution production characteristics will continue to circulate for 15-20 years somewhere on the planet until they are scrapped.

Unless the fundamental flaws in the CAFE mechanism, with its focus on average pollution production rather than total pollution production is dramatically changed in a permanent way, every EV purchased is being cross subsidized by the sale of a high consumption/ high pollution vehicle that suggests that the fleet will never reach even 50% EVs.

Moreover the effectiveness of an excessive reliance on EV penetration is itself questionable. In California, where state policy has been exempted from the federal preemption, very aggressive marketing and subsidies for EV sales have failed to penetrate the market significantly. Consumer skepticism persists as to range of distance and cold weather reliability. This suggests that even with very aggressive federal policies lasting decades, it is dubious that an EV policy alone could succeed.

Massachusetts could lobby the federal government to significantly improve these defects in the current CAFE based system, but there is no mention of this possibility in the draft plan.

## A Meaningful Role for State Government

### Public Transportation

State government could make a difference by providing significantly more attractive, frequent, and inexpensive public transportation. This could convince enough households to own one less vehicle per household, and to use that vehicle for fewer trips. Reducing congestion on roadways can reduce the number of vehicle hours of vehicle circulation, reducing

adverse health impacts near the roads and reducing emissions.

Yet the draft plan disparages the potential effectiveness of public transportation improvement without even considering it. And the current position of MBTA proposing to eliminate some bus routes, diminish peak regional rail service, and cut the frequency of rapid transit service, and leave fares excessively high doesn't even pretend to seek to encourage a shift in travel to public transportation.

## TCI

Governor Baker's TCI initiative could change the ownership and use of private vehicles, by prudent expenditures of the proceeds of the TCI. If the only incentive provided by increasing the price of carbon through TCI is to price out less affluent people to reduce their accessibility, its impact would be very regressive. The potential of the TCI is in the prudent use of the revenue produced by TCI to reduce pollution while increasing accessibility. But this is not developed in any detail even conceptually in the draft plan.

## Housing

Changes in density and affordability of housing could lead to a cluster of "15 minute neighborhoods" where many of a household's needs can be met by walking and transit.

But if it takes 15 minutes or more before the bus or train arrives, and if transit fares are too high, the 15 minute cluster concept is defeated before it can begin.

## Regional Rail

Revising the expensive and infrequent commuter rail system to transform it into a Regional Rail system with 15 minute frequency as suggested by the FMCB could open affordable housing supplies in gateway cities like Brockton, Fall River New Bedford, Lawrence, and Worcester.

## Intercity Rail

Shifting aviation demand for 200 mile or less trips to frequent and convenient intercity rail could reduce pollution and greenhouse gas production from aviation, and help to rejuvenate the economies of Springfield and Worcester.

## Trucking Regulation

Recognizing the growth in trucking and delivery services and the pollution potential of greater congestion on the roads used suggests stronger regulation of trucks, and improved transit to reduce auto congestion.(The Boston Metropolitan Area has fallen to fourth worst in the nation, from its previous worst in the country position, but as the economy recovers, so will congestion unless there is a plan initiated to do something about it, and grow back better.)



There is a maxim that you cannot manage unless you measure. We need a two part program that identifies a large number of initiatives to make things better, and then measures frequently to see if we are making progress to the goal.

Massachusetts has the capacity to monitor the number and state of the vehicles in use, the vehicle miles and vehicle hours travelled, measure congestion and pollution associated with congestion, and human exposure to public health risks, as well as cumulative total climate impacts from the use of vehicles.

But the draft plan does not identify any significant role for state initiative, nor plausible initiatives to make a difference, nor any mechanisms for periodic measurement and public outreach.

We need a better plan to deal with this existential threat, and I urge that a much more energetic effort is put into a next improved version of the plan, that focuses particularly on what the state can do to improve things.

March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
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Boston MA, 02114

American Institute of  
Architects - Massachusetts  
Citizens' Housing and Planning  
Association  
Conservation Law Foundation  
Environmental League of  
Massachusetts  
LivableStreets Alliance  
Local Initiatives Support  
Corporation - Boston  
Massachusetts Association of  
Community Development  
Corporations  
Massachusetts Public Health  
Association  
Metropolitan Area Planning  
Council

Dear Secretary Theoharides:

Thank you for the opportunity to comment on the Interim Clean Energy and Climate Plan (CECP) for 2030. The Massachusetts Smart Growth Alliance is a coalition of organizations working on a broad range of policy issues at the intersection of housing, transportation, and climate change. Decarbonization is a central feature of our goals as a coalition, and we thank the Executive Office of Energy and Environmental Affairs (EEA) for developing a plan that takes many steps in the right direction towards achieving net zero emissions by 2050. We respectfully offer these comments to elevate the importance of smart growth and strengthen the comprehensive statewide decarbonization strategy.

While rapid electrification of the transportation sector is essential, without long-term investments in a robust and reliable public transit system and changes in our land use policies to support more dense, affordable, mixed-use development near transit, pursuing this pathway of decarbonization alone will exacerbate existing inequities. Electrifying the public transit systems must accompany increased frequency, affordable fares, and expanded routes of our trains, buses, and ferries. Reliance upon telecommuting to achieve reductions in vehicle miles traveled (VMT) does not serve individuals who are transit dependent and do not have the option to work from home. The absence of a robust smart growth strategy within the CECP misses the opportunity to capture the many co-benefits of reducing VMT through enabling more affordable housing and mixed-used development near transit. These benefits include improved public health outcomes, better access to jobs, and safer streets.

The CECP assumes by 2035, all newly sold light-duty vehicles will be electric or other zero emission vehicles. Given the average life of a light-duty vehicle, this rapid fleet turnover will not be easy or cheap—billions of dollars in subsidies may be needed. Investing in public transit and targeting mode shift as a way to reduce the number of trips taken in a personal vehicle is not only a more affordable pathway, but it will also lessen the pressure on our grid to accommodate a rapid switch to electric vehicles. Furthermore, smart growth

ensures more land is available for preservation and carbon sequestration. Finally, incentivizing smart growth and making smart land use decisions is far more cost effective than the significant subsidies needed to accelerate electric vehicle adoption.

The Interim CECP notes that the Commonwealth will continue to pursue a package of smart growth policy solutions, but it offers insufficient details on what additional solutions should be on the table. We encourage the Administration to build upon the momentum following the successful passage of Housing Choice language in the Economic Development Bond Bill, including the multifamily zoning requirement for MBTA communities. Expanding upon these zoning incentives and requirements, paired with expanding transit access, alleviating traffic congestion, and reducing building energy demand would help to orient housing production toward VMT reduction and decarbonization. Our Coalition stands ready to partner with you to integrate additional smart growth policy actions into the Commonwealth's broader decarbonization strategy.

It is important to note that for equitable transit-oriented development to be successful, we must have a safe, reliable, and affordable transportation system. We urge EEA to place greater emphasis on the importance of investments in our public transit system as a pathway toward decarbonization. The climate mitigating effects of producing more housing and enabling more compact, mixed-used development near transit are undermined if transit service is unreliable and people still need to travel by car. Additionally, as more workers expect to have the flexibility to work from home or travel into the office as needed, our public transit system schedules and infrastructure must be nimble enough to accommodate the evolving commuting patterns of the future.

In addition to increasing investments in transportation and fostering more transit-oriented development, decarbonizing buildings is essential to complying with the Commonwealth's emissions targets for 2030 and 2050. We care deeply about addressing the lack of affordable housing options in the Commonwealth and believe the goals of mitigating climate change and accelerating housing production are mutually supportive. As is the case with policies oriented towards smart growth and VMT reduction, decarbonizing the building sector offers a host of co-benefits, including improving public health outcomes, creating thousands of well-paying jobs in a time of great economic need, and helping to confront Massachusetts' housing crisis by constructing efficient, affordable homes. In order to achieve these goals, the CECP should incorporate annual targets to ensure heat pump deployment that is affordable for low- and moderate-income

households and to ensure equity not only for residents but also for workers in transitioning the building sectors toward a more climate-friendly future.

To facilitate the rapid and efficient decarbonization of our older housing stock – especially smaller properties – it is essential that clean energy and climate funding be leveraged with housing dollars and vice versa. It is equally essential that these dollars be delivered through a streamlined funding process that does not require homeowners, landlords, property owners, CDCs, municipalities, and others to apply to multiple sources and deal with different rules, timelines and requirements. We must not create an environment where housing and climate agencies are competing against one another, but rather help facilitate stronger relationships. In addition, we recommend that the state develop a policy toolbox to mitigate concerns of displacement, rising rents, and reduced affordability of energy- and climate-efficient housing stock, especially in Gateway Cities. Ensuring such units remain affordable across all incomes, requires state assistance. We encourage EEA to integrate more details for the building sector in the final CECP to accelerate this transition.

Thank you for your consideration of these comments. We firmly believe that mitigating the increasingly harmful effects of climate change must be a centerpiece of the Commonwealth’s plans to achieve its housing and mobility goals. Reducing VMT, enabling greater housing production and mixed-used development near transit, transitioning the building sector to more climate-friendly practices, and investing in robust transit systems are all smart growth policy levers that must be part of the climate solution. We look forward to serving as your partners to implement this comprehensive decarbonization strategy.

Please do not hesitate in reaching out to any of the MSGA members with any questions you or your team might have.

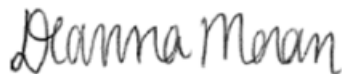
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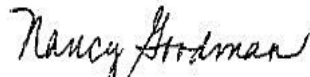
John Nunnari  
Executive Director, American Institute of Architects – Massachusetts



Rachel Heller  
Chief Executive Officer, Citizens' Housing & Planning Association



Deanna Moran  
Director of Environmental Planning, Conservation Law  
Foundation/Massachusetts



Nancy Goodman  
Vice President for Policy, Environmental League of Massachusetts



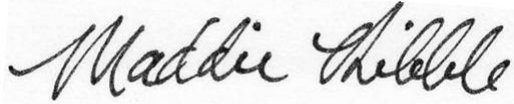
Stacy Thompson  
Executive Director, LivableStreets Alliance



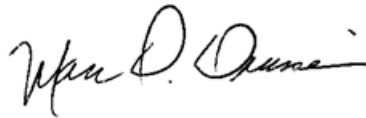
Karen Kelleher  
Executive Director, Local Initiatives Support Corporation



Joseph Kriesberg  
Executive Director, Massachusetts Association of Community Development  
Corporations



Maddie Ribble  
Director of Public Policy & Campaign Strategy, Massachusetts Public Health  
Association



Marc Draisen  
Executive Director, Metropolitan Area Planning Council



March 22, 2021

Secretary Kathleen A. Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street - Suite 900  
Boston, MA 02114

Dear Secretary Theoharides:

The New England Convenience Store & Energy Marketers Association (NECSEMA) represents convenience store and gasoline retailers, independent transportation fuel marketers, and the businesses which supply them. NECSEMA members own, operate and/or supply most of the fuel distributed and sold through over 8,500 convenience stores and stations in New England, which employ approximately 120,000 people, and account for over \$32 billion in sales annually. In Massachusetts, we represent almost 3,400 convenience stores employing over 54,000 people.

We appreciate the opportunity to submit for your thoughtful consideration our general, and detailed comments on the Commonwealth's proposed Interim 2030 Clean Energy Climate Plan (CECP). As you are most acutely aware, the 2030 Clean Energy Climate Plan was developed to identify strategies to achieve greenhouse gas (GHG) reductions across the Commonwealths to 45% below 1990 levels. With the expected passage of SB 9, that mandatory emission reduction target for 2030 will rise to a 50% reduction. This change demands re-analysis of the strategies and economic impact this new standard will have on what is currently contained in the 2030 CECP. According to news reports, you indicated such a change would have over a \$6 billion economic impact, including acceleration of several proposed strategies.

It is not yet known publicly how the proposed strategies within the 2030 CECP will be adjusted, or whether new strategies not previously considered will need to be adopted to meet this new mandatory requirement. While we appreciate the detail analysis and strategies put forward, and all the impressive work you and your staff have contributed toward its development, we respectfully reserve our rights to continue comment on this document past the March 22, 2021 comment deadline. Given this uncertainty, we respectfully request an indefinite suspension of the 2030 CECP comment period, until such time the Commonwealth can publicly present an amended document that considers and addresses this new 50% emission reduction requirement.

### **General Comments**

NECSEMA has followed with keen interest state, national, and international developments aimed at reducing greenhouse gas emissions across all sectors of the economy, and specifically within the transportation sector. We firmly believe our industry, the companies that distribute and retail motor fuels, will have a significant role to play as the transportation sector evolves and transitions over the decades, not days, toward cleaner and renewable liquid fuels, electricity, hydrogen, or other fuel choices. We also believe we have a major role to play in this future of mobility, whatever the fuel of choice becomes, as our members operate the best real estate along the most trafficked roadways in New England.

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Most importantly, as we collectively go about this essential effort to reduce emissions, **it is imperative that the ideology for action become integrated with and leverage the knowledge of those participants in the economic marketplace to achieve meaningful results, successful programs, and least-cost complimentary policies.**

In this context, NECSEMA is concerned by the format and approach used by Massachusetts to establish its related planning, policies, and resultant strategies aimed at reducing greenhouse gas emissions across all sectors of the economy. The composition among the GWSA Implementation Advisory Committee and the collection of other related advisory boards and commissions are top-down, and lack robust private sector representation, especially as it relates to supply, distribution, and retailing of traditional fuels during this long transition and their future role in mobility.

We recommend that the Administration consider meaningful ways, beyond general comment periods, to obtain our and other businesses and industry experts input and collaboration. The need for greater inclusion through an expansion of business representation, sector composition, and function of its various climate related boards and committees must be developed and implemented. **Failure to create this foundation and shared vision risks delay, public policy failures, and forsakes widespread public acceptance.**

### **2030 CECP Specific Comments:**

#### *T1 Strategy Actions:*

- *In 2020, the Commonwealth signed on to the regional TCI-P cap-and-invest program memorandum of understanding; MassDEP will begin implementing the program in 2023.*
- *After TCI-P is in place, MassDEP will work to develop and implement a regional LCFS no later than 2026.*

As proposed, TCI-P will require large distributors of transportation fuels (gasoline and on-road diesel) to register with state authorities and purchase emission allowances at quarterly public auctions based on the volume of fuel they sell in each state. In the first year of the program (2023), TCI-P officials are on record in projecting the allowance fee for each metric ton of CO<sub>2</sub> translates to a 9-cent<sup>1</sup> per gallon cost increase for gasoline at most. No projected cost increase has been released concerning diesel fuel; however, it will likely be higher than gasoline given diesel contains more carbon, and therefore produces more CO<sub>2</sub> emissions when combusted.

TCI-P will implement annually decreasing emission caps, along with corresponding decreases in the number of allowances offered for sale. The allowances fees would be collected by a contracted vendor, pooled, and re-distributed to each state using an unknown set of criteria. At a minimum, states are required under this three-state compact to dedicate at least 35% of all allowance revenues for the benefit of underserved and overburdened communities, with the remainder left to each state's discretion.

If enacted TCI-P will set in motion a 30-year or more annually adjusted fee that will increase the retail price of gasoline and diesel fuel all to ultimately change consumer behavior. TCI-P was designed by the Georgetown Climate Center to establish, a long-term funding source, not necessarily meaningful emission reductions.

NECSEMA understands the need to reduce Greenhouse Gas (GHG) emissions from the transportation sector. However, as the *regulated community* for any transportation related GHG reduction program, especially TCI-P, we have unique concerns often not visible to the public or contemplated by lawmakers and regulators. **Described below are what we believe are the most critical issues and concerns on TCI-P based on our analysis, insider knowledge of the hyper-complex and competitive fuel distribution system, years-long**

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<sup>1</sup> <https://www.bizjournals.com/boston/news/2020/12/21/ma-joins-vehicle-emissions-pact.html>



**involvement with TCI, our active understanding of this program, and the anticipated impacts this program will have on retail motor fueling operations, and on our customers, throughout the Massachusetts, Rhode Island, and Connecticut marketplace.**

### **Lack of a True Regional Approach**

In 2010, thirteen representatives, coordinated by officials from the Georgetown Climate Center worked to develop this program. This included representatives from Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, and the District of Columbia. Presently there are now only 12 jurisdictions involved with this program as Maine and New Hampshire no longer participate, but North Carolina recently began observing late last year. Of the current twelve jurisdictions, it is notable that only two other state Governors and the Mayor of the District of Columbia signed the MOU to begin implementing this program.

Lacking a true regional approach that would have minimized the competitive advantage of non-participating states over participating states along their borders and shared markets, **we cannot support an incomplete regional cap and invest program.** While Massachusetts is bordered by two states that have signed the MOU, New Hampshire, and New York remain non-participating states. It is essential that any commitment under TCI-P have contiguous state participation so the businesses along the border, our members, and consumers, are not harmed by the increased cost to their fuel while competitors over a border enjoy far less expensive fuel prices. Businesses along the borders of non-participating states will be at an immediate and significant disadvantage.

It also should be noted that the emission profiles within each TCI state will be altered as passenger vehicles and trucks become incentivized to purchase motor fuels in non-participating states, especially along border communities and interstate commuter and trucking routes.

### **An Important Clarification**

Despite comments perpetuated by state officials, and follow up media reports, our industry wants to be clear:

***The costs borne by fuel suppliers and distributors under TCI-P to purchase emission allowances and related compliance costs described in the 160-page proposed model rule released on March 1, 2021, will be passed through at the pump to the consumer.***

Massachusetts state regulators have even suggested to us that larger wholesalers or distributors could absorb some of the allowance fees and compliance costs, and thereby lower the fuel price they offer for sale to capture a greater market share resulting in the consolidation and monopolization of the retail fuel supply industry, where the largest remaining suppliers would control and set the regional market price and minimize competition. We find this notion deeply concerning as it illustrates an overall lack of understanding of our industry operations by state regulators and TCI officials. In fact, to the contrary we have repeatedly commented to State and Georgetown Climate Center Officials that we want all suppliers and distributors as eligible participants in this program, not a chosen few based on size, volume, or organizational sophistication. NECSEMA believes a competitive and open marketplace best serves consumers throughout the Northeast, not a monopolistic one controlled by our largest members.

### **Public Opinion of TCI**

Many polls have been conducted with registered voters in the region on TCI. In general, 2/3rds of those polled express a strong desire to address climate change. However, polls expressing these results have not included questions on who pays for taking these actions or how much a payee would be willing to pay. **When voters are informed, they will have to pay at the pump, the metric**

**flips with 2/3rds opposed to this program**, especially considering any future non-emission related gasoline or diesel fuel tax increases. As we are the only front facing organization experiencing first-hand a consumer's frustration over fuel prices, we can tell you that the public's acceptance of these cost increases will be met with strong resistance, frustration, and anger. The 2030 CECP needs to robustly address overall public acceptance of this and other emission reducing initiatives.

### **Design Flaws within TCI,**

A primary concern for NECSEMA is with TCI's decision to set the point of regulation at *position holders*, an inelegant attempt to capture companies that own product in terminals, rather than *state licensed distributors*. The criticism is simple as is the solution: Each month, state licensed distributors remit excise tax to the state in which motor fuels were delivered into gas station underground storage tanks. It would be very simple to have TCI allowance fees follow this process as the credit is imposed in the state where the gallon is combusted. In fact, we are unaware of any other state within the entire TCI jurisdiction that does not handle their excise tax in a similar manner. Instead, position holders, which sell to dozens of distributors crossing state lines multiple times each day, will be required to monitor where every gallon is ultimately delivered. It is not hard to see the burdensome divide between the two options.

As motor fuel wholesalers and retailers operating across New England, we are the only organization with the expertise and full range of experience on fuel supply logistics, distribution, purchasing, selling, storing, tax reporting, and exchanging this fungible commodity in a hypercompetitive marketplace. Since TCI was first officially revealed in 2019, we have had issue with its proposed architecture defining regulated entities as "position holders" and "enterers". We can trace the program's decision to a July 13, 2018 report titled Reducing Transportation Emissions in the Northeast and Mid-Atlantic: Fuel System Considerations, by Drew Veysey, Gabe Pacyniak, and James Bradbury of the Georgetown Climate Institute. Whereby they state:

***"6) Of the three possible points of regulation, Prime Suppliers provide the best balance of administrative ease and consistency across multiple states. On the other hand, both Prime Supplier and the state points of taxation are potentially viable options. State points of taxation is viable because these are already established for all states. However, Prime Supplier is preferable for several reasons. EIA's Prime Supplier is a lower complexity option because it provides a consistent definition that is already understood by the potentially regulated entities – since they currently report to EIA as Prime Suppliers. Prime Supplier would apply further upstream than most points of taxation, so fewer small entities would have a compliance obligation. Also, Prime Supplier reports apply to finished fuel products, not fuel components, and it allows for relatively easy addition or subtraction of states from the multi-state program."***

**It is our strong belief Georgetown Climate Center officials made a crucial mistake of oversimplifying Prime Supplier. In doing so, it will unnecessarily impose upon the fuel marketplace: (i) a new complex and duplicative regulatory tracking system encompassing 160 pages<sup>2</sup> of new regulation; (ii) upset longstanding business and marketplace practices that have been in place for over 100 years; (iii) require the allowance fees and the unnecessarily duplicative compliance costs to be passed through at the pump, thereby increasing consumer costs; and (iv) discriminates against regulated participants based on size and/or volume under this program. A program that would upset one of the most critically important distribution systems in the state should have priorities beyond "administrative ease" and not attempt to stuff a square peg in a round hole in the name of "state programmatic consistency".**

We recognize the pressure to address transportation related GHG emissions and the need to raise transportation revenue. However, cap and invest programs are not unique, and there are certainly

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<sup>2</sup> <https://www.transportationandclimate.org/sites/default/files/TCI-P-Draft-Model-Rule-March-2021.pdf>

other more streamlined approaches with safeguards for policymakers to consider for equitably generating and dedicating revenue to programs aimed at reducing emissions, rather than a convoluted and overly complicated funding mechanism, and added state and regional bureaucracy TCI-P portends.

### **Lack of Program Efficacy, Undesirable Results, and Diesel Fuel Failure**

1) TCI-P is less about reducing GHG emissions in a meaningful or least-cost manner. Its more about establishing a long-term funding mechanism for complimentary policies, public transit infrastructure, and road and bridge maintenance. Pre-covid, in December 2019, TCI<sup>3</sup> proposed fee increases of 5, 9, and 17 cents per gallon to achieve 20%, 22.5%, or 25% reductions from the transportation sector. Massachusetts was poised to receive over \$500 million per year from TCI. At that time Governor Baker facing mounting pressure to alleviate congestion, address service failures and crumbling MBTA infrastructure remained a vocal supporter of this program. While that need remains unmet, and upset by the pandemic we thoroughly appreciate and understand the Governor's willingness to consider all approaches, including TCI-P.

According to a report titled "Estimating the Regional Environmental, Health, and Economic Benefits and Costs of the Transportation and Climate Initiative Program" released by the Georgetown Climate Center in March 2021, it reveals updated reference case modeling results conducted in December 2020 (see table on page 4). These reference case modeling runs are predicated on continuous improvements on CAFE fuel economy standards, EV purchase incentives, and adoption of MD/HD ZEV emission standards. Georgetown official's Reference Case Modeling: Alternative Reference Case #2 most closely resembles our current day situation. Under this modeling run it is calculated to achieve a 25.7% reduction in GHG emissions from the transportation sector across the entire TCI footprint not just CT, MA, and RI if we do absolutely nothing (no TCI-P). So, of the 26% reductions projected under TCI-P, only .3 % will be attributed to implementing this program. We believe this underachievement is a non-starter for this program, lacking any meaningful reductions and certainly not a least cost value per ton of reduction. Where we conservatively estimate a \$120,000 cost per ton, over ten years, to remove 8,333 metric tons of CO<sub>2</sub> from the transportation sector in Massachusetts.

A second report referenced in the same December 2020 report released in March 2021 identifies an initial allowance price of \$6.60/metric ton in 2023, and then accelerating to \$12.50 metric ton by 2032. Almost doubling of the allowance price over the next ten years. This link is found on page 3 of the December 21, 2020 via a link titled "cost containment and emissions containment reserves". In this report it shows a table illustrating the projected cost containment reserve (CCR) price triggers rising annually from \$12/metric ton in 2023 to \$30.16/ton in 2032; and the emissions containment reserve (ECR) pricing triggers rising annually from \$6.50/ton in 2023 to \$12.50/ton by 2032.

In 2023, if allowance prices fall below \$6.50 per metric ton, the emissions containment reserve (ECR) would tighten the cap by up to 10 percent to take advantage of the opportunity to reduce emissions at lower-than-expected cost. If allowance prices rise above \$12 per metric ton, the cost containment reserve (CCR) will release additional allowances equal to up to 10 percent of the cap to mitigate higher than expected prices. Based on their own data, the TCI-P architects are anticipating that TCI pricing will not remain constant within the 5-9-cent range throughout the decade.

According to the most recent model for TCI described by Georgetown in its March 2021 "Elements of Program Design", the auction clearing price of emission reduction costs paid by "State Fuel Suppliers" is bound by an upper ceiling and a lower floor, between which this price can freely trade at auction. However, if the price exceeds the upper limit, this triggers the Cost Containment Reserve (CCR) which releases allowances into the market that will have the effect of lowering the

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<sup>3</sup> <https://www.wbur.org/earthwhile/2019/12/17/tci-transportation-emissions-regional-plan-gas>

price back down to the upper limit. Likewise, if the price of emission costs falls below the floor, an Emission Containment Reserve (ECR) can withhold allowances from auction until the price rises back to the floor.

Here are the CCR and ECR price ceilings and floors in dollars per metric tons as presented in the Georgetown paper, and the equivalent price per gallon of gasoline/diesel that we calculate for the first year, 2023, and the last year, 2032.

Price Ceiling	2023	2032
\$/metric ton	\$12.00	\$30.16
\$/gallon	\$.103	\$.260
Price Floor	2023	2032
\$/metric ton	\$6.50	\$12.30
\$/gallon	\$.056	\$.106

These updated figures shows that TCI-P architects claim that the price will fluctuate between five and ten cents per gallon in 2023 and will not exceed ten cents per gallon is essentially correct – these updated numbers show the upper and lower bounds to be slightly different, at 5.6 cents and 10.3 cents per gallon.

**What is not explained clearly is that these number all go up in the intervening years up to 2032, at which year the lower bound is 10.6 cents/gallon and the upper bound is 26 cents per gallon, again according to Georgetown.**

In other words, TCI has no price control over emissions costs paid by State Fuel Suppliers as the auction price fluctuates between these upper and lower limits, which costs they will pass on “downstream” to motorists. However, if demand is greater than supply for these allowances, the price of emissions costs in 2032 could rise to 26 cents per gallon, above which the Cost Containment Reserve is triggered, and the price reduced by increasing the supply of allowances from the CCR Reserve. The failure to disclose this possible cost of 26 cents/gallon paid by gasoline/diesel suppliers that is then passed on to the public is a material omission.

**In 2019 TCI officials readily admitted in the reference case modeling that 19% of the 25% emission reduction estimate, would be accomplished by existing federal and state laws regulating new car fuel economy standards, without implementing the TCI-P.** Now as of March 1, 2021, TCI officials indicate that gasoline fees will only be raised no more than 5 to 9-cents to achieve a 26% emission reduction from the transportation sector, despite earlier projections of far higher costs per gallon and lesser total emission reductions. **In March of 2021, as part of their revised reference case modeling, they further reveal that 18.8% to 25.7% of the total 26% reduction will be achieved under existing federal and state law establishing new car fuel economy standards without implementing TCI-P.**

Using the most current projection by TCI officials of 5 to 9-cents per gallon, Massachusetts **would collect \$243 million in 2023, and \$2.43 billion by 2032 assuming a 9-cent fee remains constant. All bets are off if the fee, as expected rises annually, then this figure would easily exceed \$7 billion. Which makes the minimal decreases in emissions an even worse value, and not a “least cost approach” to reducing emissions.**

2) TCI officials have yet to publicly announce the cost impacts on diesel fuel, which is critical because all goods and services across the economy are delivered using diesel fuels. Conceptually, **we expect the diesel fuel fee to be higher than 9-cents per gallon given it contains more carbon, and therefore produces more CO2 emissions when combusted.**

3) Every product in and around your home spent time on a truck fueled by diesel. The produce you bought at the supermarket, the milk from the convenience store, and the lumber at the building supply company were all transported via diesel powered engines. Like gasoline this fuel is proposed to become tightly regulated by TCI-P. But a stark misunderstanding of fuels marketing by TCI architects will put diesel in jeopardy in a way that cannot be overlooked.

The federal government and each state impose an excise tax on all transportation fuels to fund road, bridge, and highway maintenance projects. The assessment and remittance of gasoline excise taxes works well since most of that fuel is used close to where it was purchased. Therefore, accounting accurately for road usage wear and tear and corresponding need for road repair are balanced for each state. However, given the 1,000-mile range for diesel powered trucks, this is not the case.

Prior to 1983, diesel fuel excise taxes were allocated based on where the fuel was purchased, not necessarily where the trucks traveled. In 1996, the International Fuel Tax Agreement (IFTA) was passed and required all 48 contiguous states, along with all ten Canadian provinces, to pool and proportionally allocate excise tax revenues based on truck miles traveled in each state. A welcome fix for trucking companies fed-up with a patchwork of reporting requirements. The states and Canadian provinces each received their fair share of excise tax revenue for fixing roads and bridges based on where trucks travel and not where they purchase fuel. A practical fix for trucking companies and a win for pragmatic public policy making.

TCI-P will require all diesel sales to be reported and charged an allowance fee for the emissions the fuel will create when combusted. For gasoline, TCI-P architects promise no more than a 9-cent increase in the first year. While TCI-P modelers have not publicly revealed an allowance fee for diesel, considering the higher carbon content, the allowance fee will likely be higher.

By designing TCI-P as a fee and not a tax, it circumvents likely unwittingly, IFTA. The trucking industry is a highly competitive business with razor-thin margins that employs sophisticated logistics technology to find the best daily fuel prices for every truck to fill its dual 150-gallon saddle-tanks with fuel. TCI-P will not affect excise tax revenues, but it will alter the regional diesel fuel supply and distribution locations in these states, and irreparably harm the livelihoods and businesses of truck stops and rest areas across this three-state corridor. It is expected that diesel fuel sales within Connecticut, Rhode Island, and Massachusetts, will precipitously plummet once TCI-P is implemented, as trucking companies employ their logistic tools to avoid TCI-P states and paying their extra per gallon “fee”.

**Contrary to its goal of generating revenue for complimentary policies to lessen emissions, TCI-P will become a self-defeating public policy as it relates to diesel fuel. It will be unable to capitalize on diesel fuel allowances because most diesel fuel purchases will migrate toward non-participating TCI-P states.** The trucking industry is not a captive audience as a gasoline passenger car owner, they will seek out better deals in other states, and throw cold-water on the burgeoning cleaner biodiesel offerings.

4) TCI officials have stated that the program will involve an emissions cap, and a quarterly public auction of allowances, both of which will decline over time. We are alarmed that this program will, by design, create rationing or temporary closure of retail outlets for gasoline and diesel fuel. For example, what will happen if gasoline or diesel demand remains at or just above the cap set by the environmental regulators, and allowances become scarcer and scarcer, and the retail price of fuels become more costly. This scenario is not hypothetical, but a desirable result to change consumer behavior. **For station operators, there may not be enough allowances available at auction or in the secondary market that are held by speculators which are affordable. We ask again – will gasoline stations need to ration or close to avoid being in non-compliance with these requirements?** The notion that regulators will have time to *figure it out* is not believable nor responsible. They have not engaged with the regulated community in deep-enough fashion to have contemplated the countless scenarios that are likely to exist. Fuel distribution is a

24/7/365, fast paced, hyper competitive business. There is not time to wait on government when a company is out of business due to unavailable allowances. This is too important to figure out *on the fly*.

### **Border Concerns**

TCI-P disregards state motor fuel import and export networks, with an emphasis on border state dynamics. The overlap between these two variables has the potential to decrease fungibility for transactions, the potential for market disruptions, or worse shortages. The Northeast's lack of refineries, close proximity to other states, and existing transportation routes from surrounding bulk terminals to in-state storage facilities has created a dynamic and fungible marketplace for petroleum transactions, which also encompass exchange agreements between bulk storage facilities to minimize supply fluctuations and unnecessary added transportation costs and resultant emissions.

For example, in Massachusetts, fuel is routinely imported from Providence, RI, Portsmouth, NH, and Maine, Vermont to supply retailers throughout Massachusetts. The marketplace is generally balanced and does not experience major disruptions or shortages. Now apply the TCI-P in Massachusetts, but not in New Hampshire or Maine which remain out of this program. The marketplace may become unbalanced. **In addition to TCI state customers crossing state lines to purchase fuel without the added TCI-P fee, state suppliers and exchange agreements may also be influenced where they choose to purchase or exchange fuel in response to these dynamics.** Granted that the fee collection required by TCI-P will not be affected as proposed, it is the dynamics of an uneven playing field among participating and non-participating TCI states that will emerge and possibly erode the stability of the current marketplace and introduce supply disruption and/or major price imbalance.

We respectfully request that you consider our constructive criticisms of TCI-P and urge you to not implement it in Massachusetts as currently constructed. As always, we remain willing to lend our expertise to this process and forging together a workable program toward reducing emissions from the transportation sector.

### **Specific Comments:**

#### *T4 Strategy Actions:*

- *EEA and DOER will explore a utility-based residential charging incentive program.*
- *EEA, DOER, and MassCEC will address how to improve DCFC financial viability through pilot projects and seeking to resolve alter current punitive rate structures.*
- *DOER will analyze and propose potential revisions to rate structures (e.g., demand charges) that may represent barriers to public charging.*
- *EEA and DOER will explore and support Time Varying Rates (TVR) and Active Demand Response (ADR) programs, including as part of demand response programs in the next Mass Save® Three-Year Plan (2022-2024)*

1. As an initial matter, the 2030 CECP should clearly establish the goals that it seeks to achieve through the rate designs for residential, private, and publicly available commercial and industrial EV charging. Only by first establishing such goals and objectives can designs, feasibility evaluations, or policy options be evaluated based on their effectiveness and overall costs and benefits. In particular, the plan should state with specificity its goals with respect to data collection, impact on customer behavior, and impact on EV adoption metrics such as EV miles traveled and, in accordance with Massachusetts polices and guidelines, and ensure any rate impacts are fully investigated by the Department of Energy Resources (DOER) for reasonableness.

Other goals, such as reduced peak-usage of the distribution system, should also be clearly identified, measured, and implemented in the best interest of all ratepayers before new policies are adopted. Further, the plan should clearly outline the metrics by which it will evaluate the effectiveness of various rate designs proposed for deployment. When determining whether rate design proposals for EV customers is appropriate, the DOER's decision-making should be governed by certain core principles

that have previously guided its policy with respect to grid modernization and the development of EV charging infrastructure.

2. The MADOER should only approve such programs if they are demonstrated to be in the public interest; second, it should not approve any rate designs, policies or programs that will hinder the development of competitive markets. These guiding principles are further developed in the specific considerations described below:

Policies aimed at supporting EV growth should be based on the best available data and best practices. The DOER should consider the data and information currently available from Massachusetts and other jurisdictions. It should also ensure that it reviews and continues to review a complete and balanced record of such information and is not overly reliant on theoretical information provided by electric distribution companies and EV infrastructure providers. That may require the DOER to periodically review time of use (TOU) EV rates as more actual (versus theoretical) data is collected by the utility and analyzed. The Commission must ensure i) TOU rate effectiveness is benefitting ratepayers, ii) the price signals in the TOU rates lead to increased EV adoption and economical charging discipline, and iii) TOU rates and EV use lead to the desired environmental benefit to society:

- Any benefit-cost analysis put forth in support of proposed TOU EV charging rate design proposals should consider the benefits, costs, and risks to include but limited to the following stakeholders: electric utility customers (residential and commercial); EV drivers; competitive EVSE market participants (public Level 2 and Direct Current Fast Charge (DCFC) site hosts); and the electric distribution company shareholders.
- When evaluating whether a proposal is in the public interest, the DOER should consider its finding that it is in the public interest for the distribution companies to prioritize EVSE site locations that are publicly accessible and that serve the public at large. In addition, DOER should review any proposed TOU rates in the context of the current hypercompetitive vehicle fuels market, with emphasis on customer adaptation, ratepayer benefit, and rate transparency.
- Regulatory policy, including the methods by which rate designs are authorized should not favor particular technologies, charging locations, market participants, rate classes, or EVSE ownership models—especially utility ownership models—over others.
- For any use of ratepayer funds, the DOER should ensure that such use does not displace market activity, and that it is not used to advantage electric distribution companies and their shareholders over market participants, or certain technologies, sectors, market participants, or business approaches over others.

3. The DOER should consider the ways in which any TOU rate i) impacts the competitive transportation markets including EVSE and ii) provides consistent treatment and opportunities across rate classes, charging locations, and EVSE hosts. While consistent treatment may be accomplished by offering equivalent rates across rate classes, the distribution companies might also develop proposals that offer equivalent ratepayer benefits to different groups of ratepayers, according to their specific needs. For example, where design options may provide benefits to residential customers with EVs, the distribution companies should be encouraged to also develop offerings that would provide comparable benefits to C&I ratepayers and to site hosts who support different EVSE technologies. See, e.g., National Grid Rate Case, D.P.U. 18-150, at 340 (describing the proposed DCFC Demand Charge Discount). Further, there should be no special rates or utility investment incentives that would unfairly benefit utility shareholders and the expense of other competing EVSE providers, even on a limited or pilot basis.

4. If the DOER authorizes TOU rates in connection with a targeted deployment of metering capabilities, it should only make those rates available to customers with separate EV meters, metering

technology embedded in EV smart chargers, or otherwise, implement procedures that would allow the distribution companies to measure EV-specific electricity use. EV segregated usage information is critical to i) evaluate the effectiveness of the TOU rate design and actual load profiles in connection with EV use and ii) assess transportation-specific charges and taxes, like gasoline taxes that currently fund roadway infrastructure.

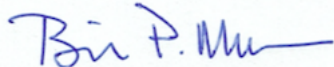
5. NECSEMA notes that utility rate structure is only one component of a comprehensive statewide strategy to facilitate private investment in EV public charging infrastructure. The cost of installation and operation of the EV charging facility is the primary barrier for private investment in DCFCs. Demand charges are an important cost causation component but initial infrastructure investment and installation costs, including any new TOU metering requirement, are upfront charges that impact decision-making.

NECSEMA members do not oppose reducing greenhouse gas emissions, rather our business model is to provide the products and services our customers want, often when they need them the most. As customer demand for fuel choice evolves, we will adapt along-side them ensuring we meet their needs. It is incredibly important for NECSEMA to continue being part of current and future discussions on the transportation fuels for the future. We offer a unique and valuable perspective forged by our experiences owning and operating the best street corners in the state and across the country, deep knowledge of transportation fueling logistics, and customer behavior in a hyper-competitive market.

6) NECSEMA notes that the plan does not address the utilities' role in the ownership of and payment for the equipment associated with electric charging stations. As we have stated in proceedings before other New England states, NECSEMA continues to recommend that any direct infrastructure investment by electric utilities does not negatively impact any market-based incentives for private investment in that same EV market. This includes but is not limited to downstream of the meter investments in electric charging stations. Allowing utilities to use ratepayer funds to own and operate charging infrastructure or EVSE downstream of the meter would i) negatively impact, at ratepayer expense, what is currently a very competitive industry, ii) impact the customer experience and adaptation, iii) potentially undercut technological innovation that is generally funded and expanded through private, not utility investment, and iv) undermine the cumulative hundreds of years of experience of NECSEMA's member companies' employees in serving the fueling needs of its New England's customers. NECSEMA, under certain transparent conditions, could support the so-called "make-ready" model for utility investment in EV infrastructure, allowing private investment access to the electric grid for transportation fueling (the electric grid infrastructure upgrades and enhancements are funded by the utility while enabling privately funded EVSE installations at host sites).

Thank you again for the opportunity to provide general and specific comments on the 2030 CECP. NECSEMA members believe they can make a significant contribution to the development of the meaningful, reductions in the transportation sector and in the emerging electric transportation markets.

Respectfully submitted,



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Zero-Point Development appreciates the opportunity to provide comment on the interim Clean Energy and Climate Plan (“CECP” or “Interim Report”) for 2030. Specifically, “E6: Incorporate GWSA into Distribution-Level Policy Considerations.”

Zero-Point is a local small business and renewable energy development company committed to advancing renewable energy solutions. We believe strongly in the independent and sustainable energy production-capacity of the Commonwealth and feel the future of renewable energy should be focused on offshore wind generation. To support offshore wind, we began developing Stand-Alone Energy Storage systems in strategic locations across the Commonwealth, which is the current focus of our business model. Below, please find our comments.

On August 9, 2018, Governor Baker signed into law An Act to Advance Clean Energy, which required the DOER to develop a program requiring retail electricity providers to meet a baseline minimum percentage of sales with qualified clean peak resources that dispatch or discharge electricity to the electric distribution system during seasonal peak periods, or alternatively, reduces load on said system, resulting in the Clean Peak Program<sup>1</sup>. This philosophy must be an integral part of the CECP.

With the transportation sector currently producing more emissions than any other sector—42% of the Commonwealth’s total statewide GHG emissions<sup>2</sup> and residential households generate 60% of emissions from buildings<sup>3</sup> the state envisions the electrification of these sectors as a major component of reaching the CECP goals stating “The core elements common across pathways and most critical for consideration in the 2020s include a balanced clean energy portfolio anchored by significant offshore wind resources, more interstate transmission, [widespread electrification of transportation and building heat]<sup>4</sup>”

Although significant investment in the electric transportation infrastructure is integral to this vision in the long term, it misses the mark without the incorporation of both transmission level energy storage resources and local distributed energy storage resources at the distribution level. Massive upgrades to transmission infrastructure to supply a shorter-term peak load at the end of the day that could have been supplied by energy storage resources is not only costly for rate payers, but typically takes at least 7 years from the time the engineering designs are complete to implement before any major electrification of transportation and building heat can begin. Transmission level energy storage can enable a lower cost and faster timeline to meet these demands within the aggressive timeline set by the CECP.

None of the above accomplishes widespread electrification of transportation and building heat by 2030 without the inclusion of granular energy storage resources and the distribution level. Transmission level peak and minimum loads to not always align with every distribution feeder peak and minimum load. Even in cases where those loads align, and regardless of charging rate incentives, bulk substation and local substation equipment along with its transmission source would need to be sized for the maximum peak load possible at any time unless there is a distribution level energy storage resource that can supply the peak demand. Unlike building heat loads, EV loads move to different locations based on changing human behavior patterns and

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<sup>1</sup> (225 CMR 21.01)

<sup>2</sup> (MassDEP (2020). Appendix C: Massachusetts Annual Greenhouse Gas Emissions Inventory: 1990-2017, with Partial 2018 Data.)

<sup>3</sup> (interim-clean-energy-and-climate-plan-for-2030-december-30-2020, at 8)

<sup>4</sup> (*id.*, at 5)

Monday Mar 22, 2021

seasonal travel requiring a granular level of distributed energy storage. Time of day rates will not be sufficient to incent all EV owners to charge only during restricted hours. Time of day rates may also disadvantage essential workers and other populations who may need to share charging resources throughout the day or who work evenings and nights.

The Clean Peak program does not currently provide a sufficient incentive to sacrifice ISO Market revenue in favor of cleaning the peak or providing these benefits. Developers that have moved into energy storage with the intent to execute on the CECP and Clean Peak initiative have done so on faith that the Commonwealth will ultimately provide sufficient incentives to allow these resources to enable the CECP to reach its goal in the desired timeframe, participate in cleaning the electric grid peak load, and shift existing solar generation to high peak hours. If private developers cannot afford pay for a portion of that by using their energy storage resources, then the rate payers will ultimately pay the full cost. With the speed at which private developers can develop and deploy energy storage resources the Commonwealth has a true opportunity to meet its goals in the electrification of transportation and building heat component of the CECP plan.

Sincerely,

Zero-Point Development.





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March 22, 2021

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100 Cambridge Street, Suite 900  
Boston, MA 02114

Dear Secretary Theoharides:

The Springfield Climate Justice Coalition (SCJC) thanks the Executive Office of Energy and Environmental Affairs (EEA) for the opportunity to comment on the Clean Energy & Climate Plan (CECP) 2030. SCJC is an informal coalition of 38 community organizations in the Springfield area working for clean air, sustainability, health and equity.

### **Strengthen emissions reduction target**

As such we are concerned that the reduction of emissions be swift, scientifically designed and focus particularly on protecting health and living conditions in environmental justice communities. From that perspective, we make **the following recommendation:**

**The overall emissions reduction target (Chapter 1.4) must be raised from 45% to 50% by 2030** in keeping with Massachusetts legislative directives, United Nations guidelines and the dictates of climate science. Decreasing emissions more rapidly will eliminate the excess mortality from particulate matter and other toxic pollutants that particularly affect people in poor, black and brown communities such as Springfield. To ensure this new target is reached, the state should require an interim limit to be set for 2025.

### **Eliminate all incentives for burning biomass and garbage**

More specifically, though, we demand that, in order to reach target emissions reduction and the state's "Commitment to Equity" (Chapter 1.3) and to public health in general be achieved, Strategy E3 be modified to eliminate all incentives for burning biomass and garbage.

We represent the citizens of Springfield who have fought for over twelve years to reject plans by Palmer Renewable Energy to construct an inefficient wood-burning biomass plant in East Springfield. It is to be sited in a diverse, low-income neighborhood located in a City that was twice deemed the "Asthma Capital of the Country" by the Asthma and Allergy Foundation of

America. Springfield already is overburdened by unhealthy levels of air pollution, including from the garbage incinerator located in nearby Agawam. One in five children in the city suffer from asthma, a disease provoked by the particulate matter, nitrous oxide, sulfur dioxide, and other pollutants that will spew from the smokestack of that plant which is scheduled to burn nearly a ton of wood chips per minute.

The Springfield biomass plant and others like it are too expensive to construct and operate without subsidies or artificial markets ginned by the state. The plant's construction was stalled due to citizen resistance and lack of profitability without those supports. Now the Department of Energy Resources' proposal to amend the Renewable Portfolio Standard – violating the principles of the Commonwealth-sponsored Manomet Study – to allow inefficient biomass to qualify has breathed life into the Palmer proposal. The resistance, though, has only grown. At a hearing on the new rules in 2019, over 200 local people forcefully expressed their opposition to the Baker proposal in a lopsided debate. Yet the Department of Energy Resources nonetheless went forward with the proposed amendments, defying climate science and public health tenets.

The Manomet Study found that burning biomass contributes to, rather than mitigates, the climate crisis. Net carbon dioxide emissions from biomass plants, even when burning wood waste residues, exceed oil or gas-fired power plants for at least thirty years. International climate scientists agree we need to dramatically reduce carbon emissions by 2030. We don't have time to wait. Plus, it removes the trees needed to capture and store excess carbon from the atmosphere.

Despite the science, the 2050 Decarbonization treats burning wood wastes for energy as “zero carbon.” The Palmer plant, which is permitted to only burn “non forest derived residues” must not be allowed off the hook for its carbon emissions. Out the stack, this plant will emit nearly a ton of carbon dioxide a minute, and more than 400,000 tons of carbon dioxide a year.

Moreover, biomass is more polluting, more of a health hazard, than coal. Its emissions will force more child and adult asthma-sufferers into our local emergency rooms and likely to their graves. And that public health burden will fall particularly hard (as it has historically) on low income people of color in our city and surrounding areas, violating the tenets of equity that are presented as core to the 2030 CECP.

Finally, recent studies have shown that exposure to increased levels of particulate matter in low income communities like East Springfield increases the mortality rates of COVID-19.

We are outraged that the Baker Administration is proposing RPS regulation changes that will allow Palmer Renewable to qualify for millions of dollars each year in ratepayer subsidies. The proposed subsidy increases the likelihood that this plant will be constructed, and our city and its residents will continue to be treated by the government as a sacrifice zone for private interests. We dread the thought that Springfield will become a model for siting and building other climate-damaging, polluting biomass plants throughout the Commonwealth, should these RPS amendments stand.

Therefore, AT A MINIMUM we adamantly demand that the biomass standards in the MA RPS not be rolled back to allow inefficient biomass plants like Palmer to qualify. We also support removing biomass and garbage incineration entirely from the Alternative Portfolio Standard (APS), the Renewable Portfolio Standard (RPS), the Clean Energy Standard, and the Clean Peak Standard by 2022. In order to protect communities, public health, and the climate, the Administration must eliminate all funding for state programs that promote biomass burning.

The following illustrates just some of the support for this demand:

February 17th letter to Governor Baker opposing biomass RPS regulations changes, signed by 37 local community organizations: <https://www.notoxicbiomass.org/letter-to-baker>.

March 12, 2021:

In response to the state's proposed Clean Energy Climate Plan, the AGO wrote a [letter to the Secretary of Energy and Environmental Affairs](#), which states, among other things: "The Plan's reliance on clean energy policies and programs will only achieve the required emissions reductions if those policies and programs incentivize truly low- or non-emitting generation. The AGO remains concerned, however, that the Department of Energy Resources' recent effort to expand eligibility criteria for biomass generation units under the Commonwealth's Renewable Energy Portfolio Standards (RPS) would increase—not decrease—greenhouse gas emissions and incentivize polluting generation in an EJ community in Springfield, the asthma capital of the nation." [https://3e6ef185-94ba-47ed-82bf-adac3f5e5561.filesusr.com/ugd/f79d29\\_8593c5358c344fbaed43230c87e84f4.pdf](https://3e6ef185-94ba-47ed-82bf-adac3f5e5561.filesusr.com/ugd/f79d29_8593c5358c344fbaed43230c87e84f4.pdf)

12/21/20 Springfield City Council Resolution against biomass subsidies and RPS changes: [https://drive.google.com/file/d/1BE\\_9R\\_EOU4jxIfEk7ZXpBHUFNldJspNz/view](https://drive.google.com/file/d/1BE_9R_EOU4jxIfEk7ZXpBHUFNldJspNz/view)

Longmeadow, Northampton and Reading resolutions against biomass subsidies and RPS changes: <https://www.notoxicbiomass.org/municipal-sign-on-campaign>

Petition to stop Springfield biomass plant (with 7700 signatures) <https://www.change.org/p/state-senator-michael-barrett-tell-the-massachusetts-legislature-don-t-subsidize-pollution-in-springfield>

At least 779 individuals, mostly from the Springfield area, submitted letters to Governor Baker requesting that he not implement the proposed amendments to the RPS to include inefficient biomass. We are including a copy of one of those letters with this submission.

Respectfully submitted,

Martha A. Nathan MD, Steering Committee Member, Springfield Climate Justice Coalition

Dear Governor Baker,

I urge you to withdraw proposed changes to the Renewable Energy Portfolio Standard that would allow dirty and inefficient wood-burning power plants to qualify for renewable energy subsidies in Massachusetts.

Weakening Massachusetts' best-in-the-nation standards will increase climate-damaging emissions at a time when scientists are telling us we need to slash emissions urgently. Furthermore, this proposal will harm communities where air pollution is already a significant health hazard.

Low-income communities of color in and around Springfield will be impacted first and worst by the Department of Energy Resources' proposed rule changes. Weakening Massachusetts' stringent biomass standards will allow a large-scale commercial biomass power plant proposed in East Springfield to qualify for more than \$13 million a year in renewable energy subsidies. Springfield already has some of the most polluted air in the nation, and has been named "the Asthma Capital of the Nation." Building a power plant in this community would exacerbate the problem, adding damaging fine particulates and hazardous air pollutants where they can least be afforded. These pollutants are linked to a wide range of serious health problems, including increased risk of death from Covid-19.

Your administration aims to achieve net zero emissions by 2050 equitably and affordably, but this proposal does the opposite. Burning wood to produce electricity results in far more carbon emissions per kilowatt than fossil fuels. This proposal would force Massachusetts ratepayers to pay a higher premium on this polluting energy. And it will directly benefit a power plant that will worsen air quality in an environmental justice community that is already suffering disproportionately from environmental degradation and adverse health impacts.

Massachusetts is in a unique position to continue to be a leader in environmental and climate justice in the nation. Please withdraw your proposed changes to the Renewable Portfolio Standard.

Thank you.

Sincerely,

# Solar<sup>®</sup> Turbines

A Caterpillar Company

Solar Turbines, Inc.  
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March 2021

Massachusetts Executive Office of Energy and Environmental Affairs  
100 Cambridge St, Suite 900  
Boston, MA 02114

**Attention:** *Ms. Kathleen A. Theoharides*  
*Secretary of Energy and Environmental Affairs*

**Reference:** *Interim Clean Energy and Climate Plan for 2030*

Dear Ms. Theoharides,

We respectfully submit this letter for your consideration which contains the comments from Solar Turbines Incorporated (Solar) on the Interim Clean Energy and Climate Plan for 2030 (2030 CECP).

These comments address the proposed phase-out of incentives for fossil-fuel heating systems between 2022 and 2024, and the benefits of Combined Heat and Power (CHP) systems even as the electric grid decarbonizes. We urge the Executive Office of Energy and Environmental Affairs to revisit its proposal to end incentives for CHP, and continue rewarding high efficiency, environmentally superior CHP systems.

Solar is an American manufacturer of power generation equipment founded in 1927 and is a world leader in industrial combustion gas turbines from 1 MW to 23 MW. Solar has sold more than 16,000 combustions gas turbine systems with over 3 billion operating hours experience. These systems provide clean, efficient, and reliable power for base-load electricity, combined heat & power (CHP), standby power, and mechanical drive applications.

Solar has over 4,000 combustion gas turbine packages installed for electrical power generation and CHP in North America; all of which were manufactured in the USA. In 1981 Solar was purchased by Caterpillar Tractor Co. (now Caterpillar Inc.) from International Harvester Company. Solar is a wholly owned subsidiary of Caterpillar Inc.

Since the 2009 Solar has supplied and/or installed the following highly efficiency & reliable combustion gas turbine based CHP or power generation plants in the Commonwealth of Massachusetts:

- 8 MW CHP - public university medical center in Worcester MA
- 5 MW CHP - paper plant in western MA
- 3.5 MW CHP – paper plant in north central MA
- 16 MW CHP – district energy plant for multiple medical facilities in Boston MA
- 8MW CHP – private university in Cambridge MA
- 4.5 MW CHP – public university medical center in Springfield MA
- 4.5 MW CHP – manufacturing facility in Worcester MA (in progress)
- 8 MW CHP – manufacturing facility in Boston MA
- 44 MW CHP – private university in Cambridge MA
- 16 MW Power Plant – utility in Nantucket MA

Some of the above listed projects are US EPA CHP Award winners that have self-certified significant CO<sub>2</sub> reductions as well as dozens of Massachusetts businesses that have made public statements on the CO<sub>2</sub> reductions from their CHP investments.

Based on the information provided above we believe that Solar is a valid stakeholder to the 2030 CECP, as such we have respectfully provided the enclosed comments for your review and consideration.

CHP systems participating in Mass Save and the Alternative Portfolio Standard programs provide a suite of benefits to ratepayers that will still be realized up to, and potentially beyond 2050. They reduce the emission of CO<sub>2</sub> and other criteria pollutants, as well as providing on-site electric and thermal resiliency. We suggest as one resource examining the benefits that are quantified for CHP projects that have received the Mass Save incentive, and urge that the Executive Office of Energy and Environmental Affairs utilize program information on CO<sub>2</sub> reductions from CHP in their decision of whether to continue incentivizing projects.

CHP provides a significant CO<sub>2</sub> savings relative to current Massachusetts grid emissions. The NE-ISO Load-Weighted Marginal Unit (LMU) marginal emission rate for 2018 was 745 lbs. CO<sub>2</sub>/kWh, and the eGRID Non-Baseload emissions rate for the NE ISO, which is used to calculate CO<sub>2</sub> savings from Mass Save projects, is 931 lbs. CO<sub>2</sub>/kWh. According to a 2019 study by ICF, *As the Grid Gets Greener, Combined Heat and Power Still Has a Role to Play*, CHP emissions are estimated at 652 lbs. CO<sub>2</sub>/kWh when accounting for offset boiler emissions. Using either 745 lbs. CO<sub>2</sub>/kWh or 931 lbs. CO<sub>2</sub>/kWh, CHP provides a significant CO<sub>2</sub> savings, and will until marginal grid emissions are drastically reduced.



This savings relative to marginal grid emissions, combined with CHP's high capacity factor, leads to significant CO<sub>2</sub> savings, even compared to the same MW of installed wind and solar. According to a study by Entropy Research, LLC. 10MW of CHP with an 85% capacity factor can provide 33,533 tons of CO<sub>2</sub> savings compared to eGRID non-baseload emissions on an annual basis. For comparison, the same study found that 10MW of solar with an average capacity factor of 26.1% saved 17,159 tons of CO<sub>2</sub> annually, and 10MW of wind with an average capacity factor of 37.4% saved 24,501 tons of CO<sub>2</sub> annually. CHP can provide nearly double the carbon savings of solar and a 50% increase in savings compared to wind, for the same number of MW installed.

CHP systems also provide savings in the wholesale energy and capacity markets, and by decreasing energy imported from outside Massachusetts, keeping dollars in the state economy. CHP systems can reduce transmission and distribution costs, both for reduced capital expenditure in congested areas and in reduced O&M costs, benefiting ratepayers and increasing grid reliability. Investing in CHP also provides direct and secondary economic benefits to the state economy through industry design and construction jobs, as well as service jobs. We suggest that the FULL picture of the benefits of CHP, vis-à-vis all other clean heating and cooling technologies, ought to recognize these important ratepayer and societal benefits. CHP uniquely provides a suite of benefits to ratepayers that include the following:

- Reduction in criteria pollutants,
- Reduction in CO<sub>2</sub> (greenhouse gas) emissions,
- Power and Thermal Energy **resiliency** for appropriately designed CHP systems,
- Economic multiplier benefits (importing less energy) keeping dollars in MA economy,
- Local job creation, direct industry jobs, service jobs,
- Critical infrastructure support including health-care, hospitals, research, pharmaceuticals, key supply chain products and services,
- Energy and capacity savings,
- Reduction in utility transmission and distribution (T&D) capital costs benefiting ratepayers,
- Reduction in utility T&D operating and maintenance costs benefiting ratepayers, and
- Reduction in local T&D congestion, enhancing the network reliability.

We believe that reciprocating engine and combustion gas turbine based CHP is an important technology that is critical to many businesses and institutions in MA.. CHP provides energy resiliency and reliability, low energy costs, higher efficiency with incrementally low emissions. CHP will continue to be a very important element to maintain existing and attract new business to MA.

Your thoughtful review and consideration of our comments above is greatly appreciated. Should you require any further information, please contact the undersigned.

Very truly yours,  
Solar Turbines Incorporated

A handwritten signature in dark ink, appearing to read 'J. Coleman', written over the company name.

Johnathan Coleman, P.Eng.  
Principal Engineer and  
Senior Account Manager Power Generation



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The Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs  
Secretary Kathleen A. Theoharides  
100 Cambridge Street, Suite 900  
Boston, MA 02114

March 22, 2021

Dear Secretary Theoharides,

As an energy professional who has been certified as a building analyst by the Building Performance Institute and who has long been active on my town's energy committee and other climate-related organizations, I thank you for the opportunity to comment on the Interim Clean Energy and Climate Plan for 2030.

While my comments share a good deal in common with those submitted by Climate Action Now (CAN), of which I am a member, they are also informed by my long professional and volunteer experience in climate crisis-related and environmental issues. Therefore, **I have included additional recommendations and resources, with [links](#), getting deeper into the proverbial weeds in some areas, especially in the sections, Transforming Our Buildings, Transforming Our Energy Supply and Mitigating Other Sources of Emissions. My recommendations differ from CAN's recommendations in the Protecting Our Natural & Working Lands section.**

With the need to rapidly cut emissions by 2030, the plan's greenhouse gas (GHG) reduction targets should shift from 2025-2029, to earlier targets, as noted in my comments below. I strongly support the legislature's commitment, in the Next-Generation Roadmap, to raise the emission reduction goals to at least 50% by 2030 and recommend that this goal be incorporated into the final 2030 CECP. Strong climate policy and emission reduction targets avoid costly disaster recovery while expanding economic growth and jobs in energy efficiency and renewables and lowering statewide healthcare costs because of cleaner, healthier air.

For the plan to be implemented in a way that reflects its stated commitment to equity, it should be focused on addressing environmental injustice among minority and low-income communities who bear the burden of fossil fuel pollution. The plan should use the Climate Justice Working Group, with representatives who have environmental justice and equity expertise, as a model for the ongoing participation in the implementation of the plan, combined with prioritizing robust funding for clean technology transitions and workforce development for EJ residents who have been most affected by the long-term impacts of fossil fuel emissions.

I recommend additional guiding questions: How will this plan frontload emission reductions to accelerate a rapid drop in GHGs earlier in this decade, as needed to reach the 2030 targets? What methods will EEA use to track current progress every 2-3 years at most, to allow for adjusting policies and implementation? What alternative strategies will EEA develop to draw from if needed to meet its emission targets? How will the vast statewide investments in planned strategies be funded?

I recommend that the following approaches, policies and programs below be added to the plan, to identify and specify more clearly how and when to attain its many targets.

### **Transforming our Transportation Systems**

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By 2023, equitably implement the Transportation and Climate Initiative (TCI):

- For TCI to be equitable and not negatively impact lower and middle income (LMI) residents, codify that these residents are protected from spending a greater percentage of income on fossil fuels than residents with higher income.
  - By summer 2021, establish and empower the equity advisory board to shape TCI implementation and create a public engagement/decision-making process, with representation across income, race, and other demographics, on how TCI revenue will be spent.
  - Invest at least 70% of TCI-P funds in resources for transit-dependent and overburdened communities, such as expanded electric regional public transportation, electric rail, EV rebates, EV charging stations in EJ neighborhoods, and improved access to broadband that would decrease the need for additional vehicle miles traveled (VMTs) for work, education, healthcare, and other needs increasingly available online.
- Allow TCI funds to be allocated only to measures that address transportation-related emission reductions.
- Establish the conditions and interim targets for reducing the TCI emission cap, to ensure that it provides adequate incentives to achieve 2030 and future GHG emission reduction targets.
- Set policies to ensure that the emission cap does not allow extra fossil fuels to enter the state, particularly since some neighboring states have not committed themselves to joining TCI.



### General transportation-related recommendations:

- Develop and implement policies and programs to accelerated EV adoption in the next 5 years, to facilitate reaching the 2050 Roadmap goal of 1 million EVs by 2030.
  - Recommend specific EV rebate levels to achieve GHG emission reductions by 2030, 2040 and 2050.
  - Educate consumers, using a wide variety of methods, such as workshops at community centers and events, and social media, to reach varied demographics about the benefits of EVs; charging at a home, in urban areas, & on the road; EV range; lower upkeep costs, etc.
- Adopt California Advanced Clean Cars II Standards by 2021.
- Commit to 100% electrification of transit bus fleets and school buses by 2030, state and municipal fleets by 2035, and all commuter rail by 2035.
- Evaluate additional options for generating revenue needed to support the enormous transportation transition to meet emission targets, such as congestion charges in urban areas.
- Reduce, rather than stabilize, vehicle miles travelled (VMT) through 2030.

### Charging EVs

- Invest in grid infrastructure to enable widespread EV charging which would encourage more rapid EV adoption and specify funding required to provide electric vehicle supply equipment (EVSE) incentives to build out the charging infrastructure.
- Include an up-front rebate to consumers of up to \$1,000 for the installation of a smart, Vehicle to Grid (V2G) Level II charger, tied to participation in the off-peak charging program or managed charging program.
- In 2021, analyze alternative electric utility rate structures and barriers to installing Direct Current Fast Charging (DCFC) stations.



- Since demand for EVs will depend on access to charging stations at homes, workplaces, commercial locations, transit hubs, long-term parking facilities and along highways, establish targets for 2025, 2030 and 2035 for the number of charging stations available to the public, including goals for residential, multifamily, public and workplace locations and funding needed to build out this infrastructure quickly.
- Because landlords have little financial incentive to install EVSE, provide incentives for multi-family property owners to purchase and install EVSE at a target percentage of parking spaces provided for their tenants and pair these incentives with penalties for non-compliance.

#### Group purchasing to reduce EV costs

- Establish a group purchasing program to lower costs for state/municipal EV procurements by the end of 2021.
- Expand group-buy programs, such as Drive Green, to lower consumer EV prices.
- Prioritize electrification of medium and heavy duty ZEVs, delivery vehicles and other fleets with high VMTs.
- To accelerate EV adoption especially among LMI residents, in 2021:
  - Expand eligibility for MA rebates to used EVs.
  - Provide rebates at the point of sale by the end of 2021, as being piloted by DOER, to ease the financial burden of more costly EVs.
  - Because LMI residents are less likely to be able to take advantage of federal tax credits for EVs, by 2022, set MA rebates at higher levels for LMI residents.
  - Include vehicle exchange programs (e.g., cash for clunkers) for LMI residents.
- Require utilities to establish and promote cost-saving Time-of-Use rate structures that enable EV owners to charge their vehicles at times when the electricity is cheaper and cleaner (e.g., off-peak

or periods of high renewable power generation), and disincentivize charging during peak power demand.

- Offer time-of-use rates without placing an upfront cost burden on participants. Since off-peak charging saves money for consumers and the entire system, EV drivers should be able to easily switch rates without paying to upgrade their own meter or pay a customer fee.
- Educate consumers about the benefits of and how to take advantage of off-peak charging.
- Implement a robust education and outreach program to encourage consumers to buy EVs.
- By 2024, to reduce VMTs:
  - Expand and improve regional transit, MBTA, commuter rail, and micro-mobility (i.e., on-demand transportation, reservable transportation in small vans), combined with policies such as development near commuter rail lines into EJ communities, multi-family zoning, walking and biking options.
  - Expand broadband access in EJ and rural communities, which will allow people to access employment, educational, health and other resources without traveling.
- Invest in east-west rail across the Commonwealth, an alternative to driving.

### **Transforming Our Buildings**

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- Establish a permanent Commission & Task Force on Clean Heat by May 2021 to set mandatory, statewide GHG emission limits in the building sector by 2022, and enforcement starting by 2025, with a declining limit on CO<sub>2</sub>e from heating suppliers.
- Require investor-owned utilities to take climate into account when determining the cost-effectiveness of their energy efficiency programs (i.e., Mass Save and Community Action).
  - Align the Mass Save and Community Action program with emission goals, removing incentives for fossil fuel appliances by 2022 and adding incentives to replace appliances before end of life.
- By the end of 2022, prioritize establishing a comprehensive program, with annually-increasing targets, for deep weatherization and related health and safety repairs and upgrades, and

heating/cooling electrification, targeting LMI and EJ residents and businesses, renters, and non-English speakers. Expanded incentives to lower barriers to electrification for this population will likely be necessary.

- Address the localized public health impacts of other fossil fuel combustion pollutants (e.g., PM2.5, ozone, NOx, etc.) by conducting annual reviews of tracked emissions from the electric sector and using these reviews to compare impacts in EJ communities relative to non-EJ communities, to inform policy implementation.
- Require Green Communities to adopt a non-combustion, high efficiency net zero stretch energy code no later than 2022. **Establish net zero as a statewide base code adoption by 2025 and assure GHG emissions of building materials are included in the net zero calculation.**
  - Postponing statewide adoption of this code until 2028 will result in buildings with high emissions for many decades to come, which will add future retrofit costs and slow GHG emission reductions when urgently needed this decade.
  - **Take into account the lifecycle GHG emissions of high Global Warming Potential (GWP) building materials when calculating the GHG emissions of a new building and of retrofits (e.g., including the high GWP emissions of hydrofluorocarbons [HFCs] in some spray foam and other insulation products and air source heat pumps (ASHPs) and of concrete).**
    - **If the GHG emissions of building materials are not accounted for, the upfront GHG emissions from these materials can cause a building to add significant and immediate GHG emissions that are not recouped for many decades by the building's operational emission savings.**
  - **Passive house level building performance required by the plan may not be necessary to meet net zero or better performance, as Passive House is a prescriptive methodology and other techniques can yield net zero and even net positive building emissions, where a building produces more power than it uses on an annual basis.**
    - For example, net zero can be achieved using low GHG building materials, high R-5+ windows, high efficiency air sealing and insulating (with insulation levels of R-60 in the roof/attic, R-40 in the above grade walls, and R-20 in basement walls, and R-10 under basement slab), passive solar orientation, structural overhangs and landscape shading, high efficiency electric heating/cooling, and a roof designed for solar power, to offset greatly reduced energy demands (see deep energy retrofit 2009



[article](#) from the highly regarded Building Science Corporation and Net Zero Energy building [case studies](#) compiled by the Northeast Sustainable Energy Association).

- As noted in the [Building Science Corporation article](#) on deep energy retrofits, when constructing or retrofitting a building to be extremely energy efficient, the building also **must include the following for the safety and health of its occupants**:
  - Mechanical ventilation for safe and healthy indoor air quality and moisture control, to prevent mold which can cause allergies and asthma, and to avoid premature decay of the building structure.
    - Ventilation levels should be established **based on health targets** (such as protection from viruses such as Covid-19), not solely based on energy efficiency.
  - Combustion safety, to prevent any appliances that exhaust carbon monoxide from backdrafting into the building.
- As written in the 2021 climate bill, appliances should be required to meet efficiency standards set in that bill, and the standards should be updated as often as necessary to reflect the highest efficiency standards nationally.
- Replacing windows for retrofits, unless the ones being replaced are single-paned, is one of the least cost-effective building envelop measures and should not be incentivized, except for replacement of single-paned windows.
- Establish a workforce development program to train architects, builders, home performance contractors, and building inspectors to install and operate electrified, highly energy efficient buildings.
  - With the need for massive workforce expansion to rapidly accelerate the weatherization of buildings “driving the most aggressive pace possible in the building sector” and the rapid installation of electric heating, recognize and make specific plans to focus workforce training opportunities in LMI and EJ communities.
- Create workforce development and training programs with labor partners, to ensure good paying, union certified jobs in the building energy upgrade sector.

- Increase consumer incentives for clean heating technology.
- In 2021, direct the Department of Energy Resources to add 4 seats for energy efficiency experts to the Board of Building Regulations and Standards.
- By 2025, establish a large-scale statewide financing program or green bank for the building sector, that includes funding support for, but not limited to, the extensive costs for deep energy retrofits, equitable workforce development, local and district-scale projects, renewable energy generation, and projects that advance both GHG reductions and climate adaptation or resilience. Also require removal of barriers to building decarbonization in other state funding/financing programs, such as the Community Preservation Act and Massachusetts School Building Authority.

### **Transforming Our Energy Supply**

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- By 2028, conduct a review of the impact of clean energy incentive programs on the ability of the Commonwealth to meet 2050 net zero mandates, to guide necessary adjustments.
- Fully execute and expand the Commonwealth’s solar programs and offshore wind procurements and raise the clean electricity standard to 100% by 2035.
  - Set a minimum target of 6 GW offshore wind installed by 2030.
  - Set a minimum target of 9,300 MW of solar by 2030, incentivizing solar development near existing loads and on disturbed or built property.
- By 2022, given the enormous need for expansion of solar in order to achieve the plan’s goals, further incentivize development of solar on “built” or disturbed land and on rooftops, while decreasing or eliminating incentives for solar development on undeveloped land, in order to severely deter solar development that replaces forestland, agricultural land, and other ecosystems such as wetlands, which are insufficiently protected under the SMART program.
- Increase the RPS by 3% annually, and by 5% 2025-2030, as in climate bill S.9.
- By 2022, remove clean energy incentives for biomass and solid waste (waste-to-energy) combustion for all EEA programs, including the RPS, APS, CES, and CPS.
- Revise the CES to reach 100% electricity from non-emitting sources by 2035.

- Ensure that MLP electricity sources are decarbonized on pace with investor-owned utilities.
- By 2022, assess grid infrastructure upgrade needs for electrification of buildings, transportation and significant additional renewable generation, and start upgrades in 2023, prioritizing investment in low income communities, at no costs to these residents.
  - The Department of Public Utilities (DPU) should ensure that LMI customers do not experience increased energy costs as a result of investments in grid modernization.
- In 2021, remove all net metering caps to drive rapid expansion of solar power and its local, high quality jobs, jobs which have been lost due to the existence of net metering caps.
- Adopt PV panel and battery storage recycling regulations, as both contain hazardous materials that will need recycling at end of their useful life, especially as the life expectancy of PV panels is becoming shorter.
  - PV owners should be provided with incentives for decommissioning and safe handling and recycling of the hazardous and re-usable materials in these products.
- Require utilities to cover or drastically reduce the charges for solar interconnections.
- Immediately identify and commit to ways to expand access and incentives for solar power and solar hot water to EJ and LMI residents and affordable housing units, removing financial barriers to access for these customers.
  - Reserve at least 50% of the financial incentives, at no-cost, for clean energy investments for use by EJ and LMI electric customers and create and enhance incentives and regulatory carve-outs to encourage development of community shared distributed energy resources, such as microgrids, and other clean energy options serving these consumers.
- Revise EEA regulations to stop additional procurements of large scale Canadian hydropower as a clean energy source, due to its destructive impact on indigenous communities and on forests.
- To incentivize widespread consumer electric use outside of peak and high demand periods, require electric utilities to implement Time-of-Use (TOU) electricity pricing. TOU pricing reduces electric costs, so utilities should provide consumers with home energy monitors at no cost.

- For the huge expansion of offshore wind, make specific plans to focus workforce training opportunities in LMI and EJ communities who will benefit from the increase in local jobs.
- Accelerate approval by the DPU of Community Choice Aggregation (CCA) plans choosing Class I renewable energy at a higher rate than required of utilities.
  - Require DPU to approve ambitious CCA plans that include building local renewable generation as a part of their mission and operations.
- Evaluate behind-the-meter energy storage for opportunities to reduce distribution system upgrades, increase reliability and reduce peak demand, both locally and state-wide.

### **Mitigating Other Sources of Emissions**

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- Evaluate the availability by the end of 2021 for low and zero- Global Warming Potential (GWP) alternative refrigerants for heat pumps and future technology, especially as the Commonwealth promotes electrification of heating and cooling, and, as soon as alternatives become available, promulgate requirements for use of these products.
- To achieve more rapid reductions of extremely high Global Warming Potential (GWP) hydrofluorocarbon (HFC) “F-gases,” support R&D of low GWP refrigerants, optimize paths to commercialization of needed new products and support job skill development associated with these products and safe handling practices, by the end of 2021.
- Establish regulations such as annual inspections, proper installation that checks for refrigerant leaks, repair, and disposal requirements, to minimize HFC releases in commercial and residential systems.
  - The [majority of HFCs](#) are released by system leaks and at the end of life of products with HFCs, when HFCs are not destroyed.
  - Involve EJ communities in the development of employment-ready skills for handling new and existing refrigeration products, as the heat pump installation market ramps up in the next decade.
- Eliminate methane leaks from natural gas distribution pipelines and eliminate the use of natural gas by 2050.

- Ensure best practices and enforcement regulations are in place around solid waste, wastewater, and agricultural emissions.

## Protecting Our Natural & Working Lands

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- Creating and funding a program for “no-net loss of forest and farmland” does not go far enough to protect and maximize preservation of existing functional forest ecosystems and forest soils critical for storage and sequestration of carbon.
  - The state should prohibit commercial, clear-cutting timber harvests on public lands and focus instead on protecting existing, functional forest ecosystems and habitats, while allowing for management of state lands for resilience to climate change (e.g., for changing habitats for at-risk species and for invasive species).
    - It would take decades for clear-cut lands to be re-forested and sequester and store carbon at the levels of existing forests and forest soils; therefore, allowing clearcutting and restoration in place of land that has been de-forested is not in keeping with the need to quickly draw down GHG emissions within this decade.
  - Place a moratorium on commercial logging on public lands (state and municipal), including advanced silviculture for selective harvesting of wood for engineered wood products like cross-laminated timber, until research on various logging impacts is comprehensively evaluated for carbon sequestration and storage and for ecosystems and habitats.
    - EEA should set targets for carbon sequestration and storage by state forest and forest soils for 2030.
  - Update forest management practices to reflect evolving understanding based on forest ecology versus an extraction model and establish and enforce oversight and evaluation of all forest management projects.
- Cellulose insulation can be produced from recycled paper. Virgin wood should not be harvested for this product, to keep as much forest intact as possible for carbon sequestration and storage and ecosystem and habitat values.

- Prioritize a just transition for people whose livelihoods depend on logging, including retraining and education based on evolving knowledge of forest ecology and possibly on advanced silviculture if research shows that it sustains forest ecosystems and their carbon sequestration and storage while allowing for limited wood harvesting.
- Compile data, such as [solar area maps](#) and other solar/prior land use data collected and developed by Clark University, on PV installations across the Commonwealth, including the acres of forest, wetlands, prime farmland and other green spaces and ecosystem habitats lost to solar development to-date. According to Clark University's research, almost 7,700 acres of land has been cleared for solar development, 49% of which was forested.
  - Data collection and analysis are needed to realign incentives and disincentives to prioritize solar development on the least environmentally sensitive land and on disturbed and developed sites, avoiding forests, other ecosystems, and agricultural land at risk because of heavy development pressures. New Jersey has developed a [solar siting analysis tool](#) that Massachusetts could use as a model for identifying preferred and not preferred sites.
- Review and implement voluntary incentive programs that provide benefits to landowners, such as conservation easements, tax incentives, land use policies, model zoning by-laws, and other tools with enforcement provisions.
- Use incentives to protect farmlands from permanent conversion to other uses.
- Develop significant incentives and educational programs for farmers to use carbon restoration practices such as regenerative and no-till farming, applying compost to enhance soil health and fertility, agro-forestry and silvo-pasturing, and minimizing or eliminating use of pesticides and conventional fertilizers produced with fossil fuels.
- Identify priorities for wetland protection and restoration, keeping in mind their important values for protection against climate change impacts, particularly flooding.



## Additional recommendations

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- Develop model zoning ordinances on:
  - How to site energy projects (solar and wind farms, energy storage, power lines, etc.)
  - Allowing housing in-fill, smaller houses (1,000 square feet or less), no development in floodplains, and smaller lot sizes to facilitate adding housing stock within communities.
- Develop improved guidance to towns for site planning review (such as using soil with adequate organic content, retaining/adding native trees and native plants, maintaining streams/wetlands and buffers, controlling runoff and reducing impervious surfaces).
- Include monitoring, reporting and enforcement provisions for carbon sequestration offset markets, in addition to the measurement, accounting, and market frameworks in the plan.
- Establish a workforce development task force to address employment needs, skills development and training, displaced worker retraining, public school education curricula, community college and 4-year college courses to support the transition to a clean economy.
- On an on-going basis, educate legislators, local officials, businesses and the public about the overall goals of the transition to a green economy, the rationale behind the steps being taken, the specific steps to be taken along the way, how they will affect them, and what the state is doing to include everyone in a successful transition.

Thank you for for your consideration of these recommendations.

Sincerely,

*Sally Pick*

SJP Environmental Consulting, LLC

## **Comments of the Northeast Clean Energy Council on the Massachusetts Interim Clean Energy and Climate Plan for 2030**

**March 22, 2021**

The Northeast Clean Energy Council<sup>1</sup> (“NECEC”) appreciates the opportunity to provide comment on the interim Clean Energy and Climate Plan (“CECP” or “Interim Report”) for 2030.

The Global Warming Solutions Act (“GWSA”) has been a foundational element to Massachusetts climate policy since its passage in 2008. It has established a clear direction for the Commonwealth’s greenhouse gas reductions and instituted a set of guideposts to ensure that the effort remains on course. The GWSA’s framework has helped to create a market for clean energy resources across a wide spectrum. But, as climate science is updated, so too must our ambitions. NECEC commends Governor Baker for committing to a net zero future in January of 2020 and to Secretary Theoharides for setting an interim reduction target of least 45% below 1990 levels by 2030.<sup>2</sup> In order to keep the state on track, hitting or exceeding this target will be essential.

While NECEC offers comments that, in places, identify room for improvement in the CECP, we note that the overall direction and breadth of the Interim Report generally reflects the scope of the work that lies ahead. Importantly, the CECP identifies the need to ensure that our drive to GHG reductions is centered around equity and environmental justice (“EJ”). Each Strategic Action laid out in the CECP must be viewed through an equity and EJ lens, and we strongly suggest that issues related to equity be more explicitly identified and addressed in each of the five chapters that identify specific policy actions.

### General Comments

Before addressing three of the key areas covered in the CECP (Transportation, Buildings and Energy Supply), NECEC offers the following general comments about the CECP and urges EEA incorporate the feedback in its final Plan. First, we encourage EEA to strengthen the CECP overall by embracing bold, clear, and time-bound commitments. The next 10 years must be a

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<sup>1</sup> NECEC is a clean energy business, policy, and innovation organization whose mission is to create a world-class clean energy hub in the Northeast, delivering global impact with economic, energy and environmental solutions. NECEC is the only organization in the Northeast that covers all of the clean energy market segments, representing the business perspectives of investors and clean energy companies across every stage of development. NECEC members span the broad spectrum of the clean energy industry, including clean transportation, energy efficiency, wind, solar, energy storage, microgrids, fuel cells, and advanced and “smart” technologies.

<sup>2</sup> We note that the Next Generation Roadmap bill currently pending may increase the 2030 target to 50%. While NECEC welcomes this more aggressive target, it will not change the content of our comments nor the recommendations contained herein.



decade of action and hitting the 2030 target will require bold action from the Commonwealth throughout the economy. Indeed, the very act of issuing a CECP is a sign of the scope of action needed. While the overall target reflects a boldness and ambition, the description of specific actions that EEA and its agencies plan too often lack the appropriate sense of urgency and commitment. Some of the Strategy Actions offered show clear direction and desired results (e.g., T2 “MassDEP will adopt and implement the California Advanced Clean Cars II Standard...”) but others offer less of a clear, decisive action or a definitive result. NECEC urges EEA to adopt stronger commitments throughout the CECP. For example, instead of noting that “EEA and DOER will *explore* a utility-based residential charging incentive system” (emphasis supplied), NECEC submits that it should read: “EEA and DOER will *establish* a utility-based residential charging incentive system *by December 2024 working with relevant stakeholders*” (emphasis supplied). Similarly, “EEA/DOER will continue working with other New England states to coordinate procurement and programming for new and existing clean energy resources” should read “EEA/DOER, working with other New England states, *will establish* a coordinated procurement and programming strategy that delivers at least **XX** MW of new and **XX** MW of existing clean energy resources *by the end of 202X*” (Emphasis supplied, specific MW and date targets to be determined).

Equity and environmental justice must be at the center of each element of the effort to meet the 2030 GHG reduction target. This prioritization, informed by a holistic, people-centered approach will deliver inclusive results that will drive a just transition to clean energy. While the core technologies we need to meet the 2030 goals exist, the diverse and skilled workforce needed to install and maintain systems does not. Additional support for the Massachusetts Clean Energy Center’s Workforce Development programs, such as the Clean Energy Internship and the Clean Energy Equity Workforce and Market Development Program,<sup>3</sup> is needed to ensure that we have a coordinated statewide effort to upskill the local workforce. In addition, EEA should support other workforce training and development efforts to ensure that our Transportation, Building, and Energy Supply initiatives have an adequate supply of diverse and skilled workers to achieve our GHG emission reductions targets.

In a similar vein, we encourage EEA identify the 45% GHG reduction target as a minimum that could be exceeded should changing circumstances create opportunities to accelerate our decarbonization. NECEC recognizes the considerable analysis and work undertaken by EEA in drafting the Interim Report which has provided a strong foundation for the next 10 years. We note, however, that the rapid and unpredictable pace of innovation, price reductions and other exogenous factors (e.g., Federal policy) are not fully known (or knowable) at this point in time. As a result, NECEC urges EEA to explicitly call out that should cost-effective opportunities to exceed the 45% target exist, the Commonwealth will indeed pursue them.

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<sup>3</sup> The Clean Energy Equity Program is proposed in SECTION 14 of Senate Bill 9, “An Act creating a next-generation roadmap for Massachusetts climate policy,” currently laid before the Governor.

## **Transportation Sector**

The CECP appropriately recognizes the transportation sector's outsized impact on the state's emissions profile. The CECP also recognizes that transportation emissions have not declined since 1990. This dynamic needs to be addressed in order for the Commonwealth to have any chance of meeting its climate commitments. The strategies and policies outlined in the CECP represent a commitment to reducing transportation emissions. However, the envisioned timelines should be expedited to set us on a path to 2030 and beyond. Decisive action must be taken to ensure that transportation emissions are reduced in the near-term. The Transportation and Climate Initiative is a commendable initiative that NECEC strongly supports, and we recognize that Massachusetts will need complementary policies in the near- and long-term that augment the emissions reductions in the program. A ton of pollution avoided today will not only help us reach our goals, but will, if appropriately targeted, begin to alleviate the historical burdens placed on Environmental Justice communities. Equity and EJ concerns and sensitivities must be woven into every policy decision to ensure that incentives and benefits accrue to overburdened and underserved communities. We recommend accelerating the timelines in the CECP and ensure that all strategies and policies undertaken are focused on creating scale, stabilizing markets, and encouraging a robust private industry. We must ensure that transportation sector actions move beyond pilots and demonstrations to allow industry to drive the transportation revolution. Below we provide comment on the specific strategies outlined in the CECP.

### *Strategy T1: Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions*

This strategy contains two recommendations: implement the Transportation and Climate Initiative Program ("TCI-P") and pursue the development and implementation of a Low Carbon Fuel Standard ("LCFS"). NECEC applauds the Baker Administration for its continued leadership to develop, gather support for, and implement the TCI-P. This program would be instrumental in reducing transportation emissions, while generating much-needed revenue that can be invested in further accelerating emissions reductions and ensuring equitable outcomes. NECEC stresses the importance of using a portion of TCI-P revenues to accelerate the development of innovative business, financial, and technological solutions that will be necessary to create deep reductions in transportation emissions. Without these new solutions, we will struggle to meet our climate commitments. Similarly, we encourage a focus on electrification for all transportation sectors to deepen emissions reductions. NECEC also supports a commitment to equity within the TCI-P to ensure that transportation pollution is actually reduced in overburdened communities and that revenues are being used to ensure that EJ communities are meaningfully participating in and benefitting from the transition to clean transportation. In order to truly address equity concerns, we urge additional detail and commitment regarding how the public will be engaged in the process to determine how TCI-P revenues are allocated. We are eager to continue supporting and providing recommendations for the implementation of the TCI-P.

The LCFS can provide a glide path for reduced emissions intensity from transportation fuels, especially those that will take longer to electrify, or may not be suitable for full electrification.

That said, we need not wait until 2026 to implement such a standard. The Commonwealth and its neighbors can draw upon lessons learned in other jurisdictions to expeditiously implement the LCFS. Further, since a biodiesel blend of 20% is generally possible without engine modification and without significant additional cost, there is little reason to delay capturing these low-hanging emissions reductions.<sup>4</sup> Again, the LCFS would advance equity by delivering health benefits to communities that bear the burden of medium- and heavy-duty vehicle pollution and we should not delay on delivering interim equity benefits as we work to deeply decarbonize transportation. We urge a commitment to the LCFS on a quicker timeline than is currently envisioned in the CECP.

### *Strategy T2: Implement Coordinated Advanced Clean Vehicle Emissions Sales and Standards*

This strategy contemplates adopting and implementing three California policies: the Advanced Clean Cars Program, the Advanced Clean Trucks (“ACT”) rule, and the Advanced Clean Fleets (“ACF”) regulations. NECEC strongly supports maintaining pace with California to be among the national leaders in promoting clean transportation. Particularly, the commitment to 100% zero-emissions new vehicle sales by 2035 will ensure that we are making progress towards our 2050 commitment. Similarly, the ACT and ACF programs will address market segments that face additional hurdles to electrification but that will have an outsized impact on emissions and will benefit from additional policy pushes towards decarbonization.

### *Strategy T3: Reduce Upfront ZEV Purchase Cost Burden*

This strategy acknowledges that DOER is working to pilot providing MOR-EV incentives at the point of sale and is working with MassCEC to develop a low- and moderate-income (“LMI”) program. Streamlining incentives, by providing MOR-EV incentives at the point of sale will make the process easier for customers and, ultimately, drive greater adoption. NECEC supports making the programs as simple to access as possible, and encourages a stable, guaranteed budget to continue the program.

NECEC also supports the development of an LMI program. Again, equity must be woven into all program designs. One way to increase LMI participation is to allow incentives and rebates to be applied to used zero-emissions vehicles. This allows for lower-income customers to take advantage of the transition to clean transportation by lowering the barrier to entry. NECEC looks forward to DOER’s proposed LMI program and we also encourage that rebates and incentives be available for used vehicles. NECEC supports additional strategies to ensure that the benefits of the clean transportation transition are accessible to all, particularly to EJ populations and underrepresented communities.

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<sup>4</sup> To be successful, any LFCS program must fairly and accurately account for the emissions profiles of all transportation fuels, including biofuels.

#### *Strategy T4: Deploy Electric Vehicle Supply Equipment & Enable Smart Charging*

This strategy includes a number of ideas that could increase deployment of electric vehicle supply equipment (“EVSE”) and optimize rates and charging behavior, both of which are essential to ensuring that EV adoption occurs both quickly and efficiently. However, there are no firm commitments to achieve this strategy. Without a plan to ensure the ZEV charging is cost-effective for the driver and aligns with favorable grid conditions, it will be difficult to convince drivers to switch to ZEVs and we will fall short of our goals. NECEC urges the final CECP include concrete plans and actions to better align ZEV charging behaviors and costs with the goals of reaching 100% ZEV sales by 2035. For example, the CECP could include targets for statewide charging deployment and a directive that utilities look beyond pilots and bring forward program proposals designed to achieve these targets.

#### *Strategy T5: Engage Consumers & Facilitate Markets*

Customer education is vitally important to building the market for ZEVs. NECEC supports the customer engagement and market facilitation efforts outlined in the CECP. We encourage additional partnerships and strategies that will complement the policies to incentivize the purchase of ZEVs and deployment of EVSE.

Strategy T5 focuses mainly on EVs, which explicitly excludes fuel cell vehicles. NECEC recommends that low and zero-emission fuel cell vehicles be promoted and incentivized in the same way as EVs in the CECP. Fuel cell vehicles should be given an equal playing field as EVs in order to be successful. The state should be promoting all strategies, including promoting charging infrastructure for fuel cell vehicles, that will help the Commonwealth reduce transportation emissions and diversify the options available to customers.

#### *Strategy T6: Stabilize Light-Duty VMT & Promote Alternative Transportation Modes*

While outside of our area of expertise, NECEC supports efforts to reduce VMT and promote public transit and alternative transportation. In order to meet our climate commitments, the state must take an “all of the above” approach to transportation emissions, recognizing the needs of different constituencies.

### **Building Sector**

Accelerating progress in the building sector is crucial particularly since, as the CECP notes, HVAC equipment has long lifetimes and inefficient or fossil installations today may remain in service until 2050. Making the most of end-of-life replacements and new construction today will ensure that the Commonwealth is not locked into a dirty building sector for decades to come. Similar to our comments above, NECEC urges EEA to accelerate the timelines provided in the interim CECP in order to kickstart the transition to clean buildings, while taking care to incorporate a commitment to EJ into each of the strategies. The equity element is especially critical in this area given that LMI customers and renters have had difficulties participating in the

energy efficiency programs to date. These barriers must be addressed to ensure equity. Below we provide comment on the specific strategies outlined in the CECP.

*Strategy B1: Avoid Lock-In of Building Systems that are Not 2050-Compliant*

This strategy includes three recommendations: require a new high-performance stretch energy code by 2028, work to eliminate incentives for fossil fuel equipment in new construction, and support establishing state appliance standards by statute. NECEC supports the aim of all of these objectives, however, EEA should accelerate these timelines to avoid locking-in building systems that are not 2050-compliant. First, a new high-performance stretch code that becomes mandatory only in 2028 will forgo years of efficient construction. The interim CECP notes that one billion square feet of new construction is expected by 2030 and that, absent improvements over the current building code, those buildings would result in annual demands of about 45 trillion additional BTUs of fossil fuels, and more than 2 MMTCO<sub>2e</sub> per year in additional GHG emissions by 2030. A stretch code that become mandatory for only the last two years of this decade will not avoid these outcomes. While we understand this cannot be implemented immediately, NECEC believes that the timeline must be significantly reduced.

NECEC also recommends that the CECP make a stronger commitment to phasing out fossil fuel incentives in Mass Save. Fossil fuel incentives serve to delay progress towards decarbonization and should be removed wherever feasible. While there may be equity issues for phasing out fossil incentives for low-income customers, there could be an exception for instances where electrification is not possible for equity reasons.

Lastly, NECEC appreciates the Administration's support for establishing state appliance standards through statute. We are hopeful that the Next Generation Climate Roadmap Bill will be passed in short order to institute these standards.

*Strategy B2: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems*

NECEC supports the initiative to phase out fossil fuel heating incentives in Mass Save by 2024. While some fossil resources will likely still be necessary in 2050, we should be working to incentivize electrification as much as possible. As such, NECEC also supports the desire to increase electrification through heat pumps paired with envelope measure to ensure optimal performance. As noted in the CECP, customer education will be vitally important to ensuring that heat pumps are actually installed. NECEC also recommends supply chain education and training. Specifically, we recommend working through contractor networks to ensure that contractors know how to market and install heat pumps to customers.

This strategy also contains a desire to work to improve equity in energy efficiency program outcomes. NECEC supports this goal, and the development of specific goals and targets for reaching low-income and EJ communities. Similarly, these efforts should include a focus on workforce development in low-income and EJ communities. Ensuring equity is important not only in program design, but in the workforce development context to ensure that we are

diversifying the clean energy workforce and making each part of the clean energy transition accessible to all populations.

*Strategy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions*

This strategy envisions that the Baker-Polito Administration will convene a Commission and Task Force on Clean Heating by May 2021, and which will propose, by 2023, statutory, regulatory, and financing mechanisms needed to ensure the development of equitable, reliable, and affordable clean heat solutions for the Commonwealth's buildings. While the Commission and Task Force on Clean Heat is commendable, the timeline to propose clean heating solutions is too long. The Commonwealth should move quicker to begin the transition to clean heat; we need the policies in place soon to be on a path to meeting our climate commitments. NECEC urges that the Commission recommendation timeline be condensed.

**Energy Supply**

As Massachusetts moves towards increased levels of electric transportation and heating, ensuring that our grid decarbonizes quickly and efficiently will be a key element to achieving the 2030 targets and positioning Massachusetts to reach its net zero goals. The expected increase in electricity demand as a result of transportation and building electrification will require a continued aggressive push for clean energy generation and energy storage. We cannot rely on an assumption that the current programs, procurements and regulations will deliver on their expected results without a dedicated and vigilant administration of each. Moreover, we see increasing stress on both the distribution and transmission systems that, if left unattended, will delay or even prevent the necessary interconnection of clean energy supply. A concerted, coordinated and large-scale effort will be needed in the near-term not only to meet 45% GHG reductions targets by 2030, but to provide the necessary infrastructure to get to net zero by 2050. The urgency and scale of the changes needed mean that Massachusetts must be aggressive in pushing clean energy supply, demand-side reductions, flexible storage options and the grid infrastructure to deliver reliable, clean power.

Moreover, each of the Strategic Actions identified in this Chapter of the CECP must be viewed through the lens of equitable access to the benefits of clean energy and avoiding placing the burdens on EJ communities. We believe that EEA must place more emphasis on ensuring access to affordable clean energy supply for EJ Communities, more active promotion of LMI Clean Energy programs to increase participation rates, and more innovation in project financing that opens the door to EJ community access to project ownership and all its associated economic benefits. Below NECEC outlines its recommendations and feedback on each element of Chapter 4 of the Interim CECP, "Transforming Our Energy Supply."

### *Strategy E1: Fill Current Standards and Execute Procurements*

The draft CECP states that the current “mix of procurements, standards, and regulations will largely support the Commonwealth’s electricity sector decarbonization goals for 2030” (p38). Even if this is correct on paper, we urge the Commonwealth to aim higher and avoid complacency. In 2021, there is a significant gap between (a) the MW of clean energy under contract and qualified under other programs (e.g., SMART) and (b) the MW interconnected and delivering power to the grid. Thus, it is critical that the Commonwealth approach the electricity sector elements of the CECP with vigilance. Simply put, absent dogged oversight of current efforts, we cannot assume that all of the clean electricity projected to come on-line will be built and interconnected. Of particular concern to NECEC is the modern grid infrastructure needed to deliver new clean electricity to the grid (see further discussion at E2 (transmission), E6 (distribution)).

In addition, NECEC suggests greater specificity in Strategy E1. NECEC recommends that EEA clarify how it is measuring the 7GW of “new clean energy projects deployed.” To ensure accurate tracking, it is essential to understand what constitutes new projects: does this include projects under the first 1600 MW of the SMART program? Does it include existing contracts for hydropower under 83D and wind under 83C? Will this also include the additional procurements under 83C?

NECEC recommends two additional Strategy Action under E1. First, EEA and DOER must ensure success of SMART program by diligently assessing program periodically and ensuring projects are being interconnected. To do this, we recommend that DOER record and publish program data that reflects (a) average time between preliminary SOQ and final SOQ/Authorization to Interconnect; (b) unused capacity (by Block) due to project forfeiture and withdrawal; (c) total capacity (MW) interconnected under SMART by year; and (d) % of overall capacity that is serving EJ communities. Should projections fall short at any time, we encourage an analysis of the program that identifies barriers and solutions to them.

Secondly, NECEC urges EEA to issue an annual scorecard on clean energy capacity interconnected onto the ISO-NE system that contributes to the 4.2 MMTCO<sub>2e</sub> reduction in GHGs from this sector (p.37) and the 7GW target identified in the CECP. This should be a simple breakdown of clean electricity MWs installed/interconnected/operating by technology type (both cumulative (from the period of beginning of the CECP tracking period) and added in the past 12 month period).

### *Strategy E2: Develop and Coordinate Regional Planning and Markets*

NECEC strongly supports EEA working to ensure that ISO New England governance, markets and planning processes enable the achievement of the 2030 targets. For too long, wholesale markets have served as obstacles for clean energy resources. The regional New England Energy Vision effort is a key example of Massachusetts coordinating with other states to lay the groundwork for clean energy success. Moreover, NECEC encourages EEA to continue to

engage with the ISO and various stakeholders to ensure that the implementation of FERC Order 2222 leads to meaningful integration of clean energy resources into the wholesale markets.

While NECEC wholeheartedly supports regional cooperation among the states in areas like large scale clean energy procurements (e.g., for offshore wind), this does not remove the need to continue to pursue state based efforts to bring offshore wind and other clean resources on-line. Despite the permitting challenges at the federal level and challenging siting efforts, Massachusetts has developed a successful model for procuring significant quantities of offshore wind and other types of clean energy. As a result, NECEC urges EEA to keep this tool in its arsenal as a way to bringing additional resources to bear this decade. We note that any coordination among New England states brings opportunity and risk; the key risks include delays in timelines and the lowering of ambitions due to neighboring states becoming the “lowest common denominator.” As a result, we urge EEA to continue to deploy state-based solicitations in order to ensure that we keep pace with the level of deployment necessary to hit our 2030 GHG reduction target.

#### *Strategy E3: Align Attribute Markets w/GWSA Compliance*

NECEC supports strengthening the existing Clean Energy Standards (CES and CES-E) to accelerate the decarbonization of the electric system. However, instead of “tuning” the Clean Energy Standard, EEA should establish a bolder vision for how much clean energy Massachusetts can bring into the grid. NECEC supports the CECP acknowledgement that the CES exists in the context of other programs (e.g., RPS, APS, etc.); however, EEA should be considering a significant increase to the CES targets for 2030 (and beyond) as a way of accelerating the clean energy transition and achieving additional GHG Reduction benefits as transportation and buildings become increasingly electrified. In addition, NECEC recommends that EEA and its agencies explicitly track emerging zero carbon technologies that may mature into viable participants in CES.

NECEC supports working with MLPs to create clean energy targets to leverage GHG reductions and accelerate clean energy deployment. As with all strategy actions, we encourage EEA to put a time frame around this activity and to refine the quantifications of reductions that can be achieved through this strategy.

#### *Strategy E4: Continue to Deploy Solar in Massachusetts*

EEA rightly identifies interconnection and siting as the two most significant issues facing solar and other distributed energy sectors in Massachusetts today. Both the distribution and transmission systems must be transformed for our clean energy future and this will require significant investment in the near term. While this will require considerable levels of investment, it will be necessary. To ensure cost-efficiency, we must engage in large-scale distribution planning, but not at the expense of time delays. Based on the DPU’s work in DPU 19-55 and the various interconnection studies conducted by the EDCs, NECEC has concluded that removing the barriers to DER interconnection will require significant investment in infrastructure



in combination with grid flexibility, curtailment and load shifting. This provides many opportunities for creative problem solving between the development industry, the utilities and the Commonwealth and may include broader design and construction networks and an evolution of the financial incentives for infrastructure deployment.

Similarly, Massachusetts (and many other states in the region) will need to solve the various challenges associated with distributed energy asset siting (as well as grid infrastructure). NECEC notes that this will require difficult choices and leadership from EEA on how to ensure that the preservation of the Commonwealth's Natural Capital and expansions in renewable energy development co-exist. As such, we are pleased to see reference to a planning effort for ground-mounted solar development and urge EEA to provide additional details and a specific timeline for this critical effort.

It is quite likely that at least an additional 2GW of solar (if not more) will be necessary between 2025 and 2030. To avoid the friction of program transition associated with the move from SREC-2 to SMART and between the first 1600 MW of SMART and the (yet unresolved) second 1600 MW, DOER must begin this process early and undertake a careful rollout to minimize market confusion. To that end, NECEC encourages EEA to identify a timeframe for this effort in the Final CECP. In addition, NECEC suggests that the Final CECP explicitly outline how DOER "will facilitate a path to market" for 2GW of clean DG between 2025 and 2030. It goes without saying EEA and DOER should ensure that the SMART program delivers on its promise to get projects built and interconnected, while looking ahead to future evolution of solar programs in the Commonwealth.

In addition, energy storage will play an increasingly important role in the next decade due to both the need to balance intermittent renewable resources in a decarbonizing electricity system and the need to ensure reliability and resiliency in the face of a changing climate and more severe and frequent extreme weather. The 2030 CECP, however, does not include mention of an explicit storage goal or a need to evaluate whether current policies (such as Clean Peak and SMART) are sufficiently incentivizing storage. The 2030 CECP should include an updated storage target for 2030 and identify strategies needed to achieve it.

#### *Strategy E5: Develop a Mature Offshore Wind Industry in Massachusetts*

NECEC supports this effort to build the offshore wind industry in the northeast; coordination and cooperation among neighboring states will be critical to achieve efficient market development while allowing for local economic activity. As discussed below, robust transmission infrastructure is *critical* and associated challenges of planning need to be confronted early due to long lead times, siting challenges and construction schedules. In addition, cost assignment is another challenge that EEA must address head on as the scale of necessary upgrades increase.

We encourage EEA to consider the benefits of pairing offshore wind with energy storage to ensure that potential excess renewable energy generated from ongoing wind development is

available when needed. One area in particular that requires study and policy support is the potential for renewable hydrogen to serve the medium- and long-term storage needs of the massive renewable energy buildout anticipated over the coming decade and beyond. This is particularly important in the context of increasing electrification of the buildings and transportation sectors, as renewable hydrogen provides long-term storage and, with the appropriate transport infrastructure, can be conveyed to a number of end-users in a variety of applications.

#### *Strategy E6: Incorporate GWSA into Distribution-Level Policy Considerations*

NECEC agrees with the premise of Strategy E6: our distribution system planning, grid modernization and ways of paying grid upgrades must undergo a transformative set of changes in order to usher in an era of clean energy deployment. However, the single Strategy Action under E6 of working w/agencies and legislature “to ensure ...distribution system [is] designed to maximize the ability of the Commonwealth” to meet net zero in 2050 misses the mark on several fronts. First, given that this the CECP for 2030, having a distribution system goal that targets 2050 is the incorrect time horizon. As we have seen in Dockets DPU 19-55 and DPU 20-75, there is a crisis in distribution and transmission infrastructure TODAY that threatens the achievement of the current SMART program and Offshore Wind procurements in the next 10 years. The focus of E6, like the rest of the CECP, should be on the next 10 years.

Second, EEA should take greater responsibility for *delivering* a distribution system that will allow Massachusetts to meet its 2030 clean energy supply targets AND lay the groundwork for the 2040 and 2050 targets. Merely “working to ensure” falls short of a plan to achieve the type of creating the dynamic grid we need in both the near and longer term.

Finally, EEA should drive not only “cost-benefit analyses (“BCA”)" but should ensure that the costs of recasting the distribution system are assigned in an equitable way that (a) ensures this critical infrastructure actually gets built and (b) recognizes the broad system, ratepayer and societal benefits of achieving the Commonwealth’s GHG reduction strategies.<sup>5</sup> NECEC has been an active participant in the DPU interconnection proceedings and urges near-term and bold action to set our grid on the right path.

#### **Conclusion**

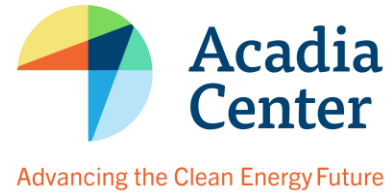
Again, NECEC commends EEA for the significant effort and care it has taken to develop the Interim Report and it appreciates the opportunity to offer these comments. NECEC urges EEA to incorporate the recommendations above into its Final CECP.

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<sup>5</sup> The Standard Practice Manual for BCA of Distributed Energy Resources (NSPM for DERs) to help guide distribution system and grid infrastructure investment decisions, and also refer to a recent LBNL report on the subject Benefit-Cost Analysis for Utility-Facing Grid Modernization Investments: Trends, Challenges, and Considerations.

# Beyond Gas

## Comments on Massachusetts' Draft Clean Energy & Climate Plan for 2030



March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy & Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

RE: Draft Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides:

The undersigned would like to thank the Commonwealth's Executive Office of Energy and Environmental Affairs (EEA) for the opportunity to offer comment on its draft Clean Energy and Climate Plan for 2030 (CECP). As Massachusetts prepares to implement an unprecedented policy program to reach zero net emissions by 2050, the targets included in the CECP are appropriately ambitious.

One topic which the CECP does not address at length is the use of natural gas in buildings. **Gas burned for space heating, water heating, and other uses in buildings accounted for more than 18% of Massachusetts' economy-wide emissions as of 2016.**<sup>1</sup> As long as the Commonwealth continues to consume this quantity of natural gas, it cannot meet its climate commitments. Yet gas companies continue to build new pipelines and solicit new customers, who install new gas equipment, increasing emissions, damaging public health, and locking in more stranded assets each year.

The Commonwealth's Department of Public Utilities (DPU), in Docket 20-80, has initiated a proceeding which could begin to address this issue. We thank the EEA, the Attorney General's Office, and the DPU for starting this investigation. At this moment, however, it is **more of an inquiry into the future of gas companies, conducted by the gas companies themselves**, than it is a holistic way to plan for the Commonwealth's energy future.

In light of that, the following pages offer some recommendations which we believe will **add clarity to the goals of the CECP as they pertain to natural gas**, in hopes that future gas system planning will more closely take account of the Commonwealth's climate targets.

We look forward to continued engagement with the Commonwealth on how best to reach our shared goals.

Sincerely,

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<sup>1</sup>This estimate dramatically underestimates the climate impacts of methane leaking from the gas transmission and distribution system, a topic which will be addressed later in this document.

Acadia Center  
 Arise for Social Justice  
 Back Bay Green  
 Berkshire Environmental Action Team  
 Boston Climate Action Network  
 Cape Downwinders  
 Ceres  
 Climate Action Now: Western MA  
 Climate Finance Action  
 Climate Reality Project: Boston Metro  
 Conservation Law Foundation  
 Environment Massachusetts Research and Policy Center  
 Environmental League of Massachusetts  
 Greater Boston Physicians for Social Responsibility  
 Green Sanctuary: Climate Justice Committee of the Unitarian Universalist Church of Reading  
 Health Care Without Harm  
 HEET  
 Institute for a Thriving Planet  
 Jewish Climate Action Network of Massachusetts  
 Living the Change Berkshires  
 Longmeadow Pipeline Awareness Group  
 Metropolitan Area Planning Council  
 Mothers Out Front: Massachusetts  
 No Ashland Pipeline  
 No Fracked Gas in Mass  
 Pipeline Awareness Network for the Northeast  
 Salem Alliance for the Environment  
 Sheffield Saves  
 Sierra Club of Massachusetts  
 Solstice Initiative  
 Speak for the Tress, Inc.  
 Sustainable Marblehead  
 Sustainable Middleborough  
 Sustainable Wellesley  
 Union of Concerned Scientists  
 Unitarian Universalist Mass Action  
 350 Central Mass  
 350 Berkshires

## **Recommendation 1: Massachusetts needs a cross-sector infrastructure plan.**

**Eliminating greenhouse gas emissions from buildings will require high levels of electrification. Increased electricity use and declining fossil fuel use must be dealt with together, because each affects the other.**

EEA created both the CECP and the 2050 Roadmap study from a system-wide, holistic perspective. These reports' wide-ranging and detailed analytical frameworks are the reason for their credibility. Such a perspective should drive all energy system planning in the Commonwealth.

To its credit, the CECP includes aggressive targets for building electrification. However, it leaves out the other half of the analysis: how the Commonwealth plans to decommission the fossil fuel infrastructure that electrification will displace. This is a serious issue; poor planning may mean that the last areas to electrify—which are likely to be environmental justice communities—are saddled with paying for the gas system's sunk costs.

The DPU's investigation in Docket 20-80 is, unfortunately, also a partial analysis. In asking the gas distribution companies themselves to oversee an evaluation of their own future—with limited input from the public—the proceeding is fated to favor the perspective of the gas industry over the public interest. More troubling, it will also, by design, exclude any concerted examination or planning with respect to the electric grid.

Massachusetts' gas utilities currently plan to invest more than half a billion dollars<sup>2</sup> in pipelines and other gas infrastructure annually for the next 20 years. Once this infrastructure is built, the Commonwealth will either fail to meet its climate commitments due to continued reliance on natural gas, or it will be forced to abandon billions of dollars in stranded assets. Neither of these options is desirable.

The Commonwealth's infrastructure plan must also consider the potential of networked ground source heat pumps, an electrification solution that could represent a way for gas utilities to evolve their business model. Massachusetts currently leads the nation in planning for this innovation—several pilot projects will break ground in the coming years. This type of utility-financed electrification would allow for a planned job transition process in line with best practices and labor standards, and could have positive equity impacts. It has the potential to reduce both emissions and heating bills with minimal impact on the electric grid.

A clear, enforceable plan to stop expanding gas infrastructure immediately and gradually wind down the distribution of gas—by investing in a cleaner, more resilient, and more affordable electric grid and transitioning gas utilities to a carbon-free thermal delivery system—can help the Commonwealth to meet its climate targets while reducing stranded assets.

## **Recommendation 2: EEA can provide balance by retaining its own gas planning consultant.**

**It is neither the responsibility nor the prerogative of natural gas utilities to determine the Commonwealth's climate policy. We ask that the EEA consider retaining its own independent consultant in order to balance the gas companies' Docket 20-80 analysis with unbiased analysis and information.**

The public must have access to reliable data about the costs, public health effects, equity considerations, and emissions impacts of continuing to invest in natural gas infrastructure. Gas companies themselves are not and cannot be a credible source of this information. The DPU has established, in DPU 20-80, a proceeding that will result predominantly in a series of studies conducted by consultants chosen by the gas companies themselves.

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<sup>2</sup> Conservation Law Foundation. "[Getting Off Gas: Transforming Home Heating in Massachusetts.](#)" December 2020.

Consequently, we fear that the DPU's 20-80 proceeding will be heavily shaped by the gas companies' foundational assumptions. Planning for the decline of the gas distribution system is a complex endeavor which ought to be conducted with care, transparency, and attention to the health and well-being of environmental justice communities.

EEA can provide an invaluable counterweight to the gas utilities' narrative by hiring its own consultant to conduct a parallel analysis, and to evaluate the gas companies' analyses upon their release in early 2022. It is essential that this process begin immediately, because this consultant will require an opportunity to examine and question the assumptions which the gas companies' consultants will take as a starting point.

### **Recommendation 3: Alternative fuels are an unrealistic way to reduce emissions in buildings.**

The CECP rightly acknowledges that real, verifiable emissions reductions can only be accomplished via electrification. Certain alternative strategies may have a role in other sectors, but the most cost-effective way to eliminate emissions from buildings is with clean, efficient electric equipment.

### **Renewable Natural Gas (RNG)**

Proponents of fossil fuels have begun to ask that states subsidize the growth of the biofuel industry, which they see as a way to comply with consumer and government demands for sustainability without having to change anything about their business model. Yet biofuels are not zero-emissions. These alternative fuels are also expensive and limited in quantity. To rely on them in the residential and commercial sectors—where air- and ground-source heat pumps, heat pump water heaters, and induction stoves are increasing their market penetration by the day—would be unwise. RNG is a shallow and futile justification for continuing to invest in gas distribution infrastructure.

RNG production capacity is limited. [According to the American Gas Foundation](#) (AGF), the amount of RNG that the industry could produce nationally by 2040 is between 1,910 and 4,510 tBTU per year. By comparison, the United States consumed 32,250 tBTU of natural gas in 2019, of which RNG could—by 2040—possibly account for between 6% and 14%. In other words, after two decades of investment and construction, during which gas companies envision that pipelines will continue to expand and emit greenhouse gas, RNG could still just barely cover 10% of the Commonwealth's 2019 demand for gas.

**Table 1: American Gas Foundation RNG Potential Estimates vs. Current Gas Demand**

Source	Low Estimate		Maximum by 2040	
	New England	United States	New England	United States
Anaerobic digestion	24.2	812.8	42.4	1,425.3
Thermal gasification	3.8	486.6	7.9	1,713.9
Municipal solid waste	14.4	256.2	32.4	694.8
Power-to-gas	0.0	357.7	0.0	678.7
All RNG sources	42.4	1,913.3	82.7	4,512.7
<b>2019 natural gas consumption</b>				
Massachusetts				439.6
United States				32,249.7

RNG is expensive. The same study also shows the unreasonable expense of RNG. According to the AGF's analysis, about half of RNG production potential could be accomplished at a cost of \$20/MMBTU or less, before being marked up for retail sale—after two decades of infrastructure investment. In the past five years, the residential

price of heating oil has been about \$19.90/MMBTU on average.<sup>3</sup> In other words, just the cost of making RNG—before it is marked up for retail sale, and before the huge cost of pipeline construction and maintenance—is more expensive than heating oil, which itself is expensive. The more RNG there is, the more costly it will be for consumers.

**RNG emits just as much greenhouse gas.** Finally, RNG is still methane. Whether the methane comes from an anaerobic digester or from a fracking well, burning it releases greenhouse gas. Leaked methane, which has a 20-year global warming potential that is 86 times that of carbon dioxide, is even worse.

If the Commonwealth chooses to adopt policies supportive of RNG, it will do so at a high cost to consumers and with tremendous logistical difficulty—all to procure the same chemical, with the same negative environmental impacts, from a different place.

## Hydrogen

Some end uses, such as certain industrial processes, are more difficult to electrify given current technology. For these uses, hydrogen may represent an attractive solution.

Globally, nearly all hydrogen produced for fuel (95%) is “brown” or “black,” meaning that it is produced using methane or coal.<sup>4</sup> By contrast, “green” hydrogen, which is made through electrolysis, can be considered safe and renewable when powered by renewable energy. However, the process of producing hydrogen through electrolysis commonly requires platinum or iridium catalysts, which may limit the supply and affordability of green hydrogen due to the rarity and expense of these compounds.

In rare cases, using green hydrogen to store renewably-generated electricity, or in high-volume situations that demand dedicated infrastructure, could help the Commonwealth deal with intermittent renewable electric generation as well as hard-to-electrify end uses. But it is deeply impractical as a substitute for natural gas in residential, commercial, and most electric power contexts, which together constitute 89% of the natural gas currently consumed in Massachusetts. Furthermore, injecting hydrogen into the Commonwealth’s old, deteriorating natural gas distribution pipelines could lead to catastrophic consequences: hydrogen corrodes metal pipes and can embrittle certain types of plastic piping.

While green hydrogen may have a place in the Commonwealth’s clean energy future, its role should be circumscribed to certain specific use cases.

### **Recommendation 4: More accurate ways of accounting for methane leakage are warranted.**

**The U.S. EPA’s method of accounting for gas leaks ignores most sources of leakage. The Commonwealth must adopt methods of tracking methane leaks that comport with the latest science.**

From the fracking well to the home furnace, natural gas leaks into the air in myriad ways. The United States Environmental Protection Agency (EPA) accounts for this leakage by assuming that 1% of all the gas that enters distribution pipelines leaks into the air before it reaches a building. However, recent studies have shown that

<sup>3</sup> U.S. Energy Information Administration. [Weekly Heating Oil and Propane Prices](#).

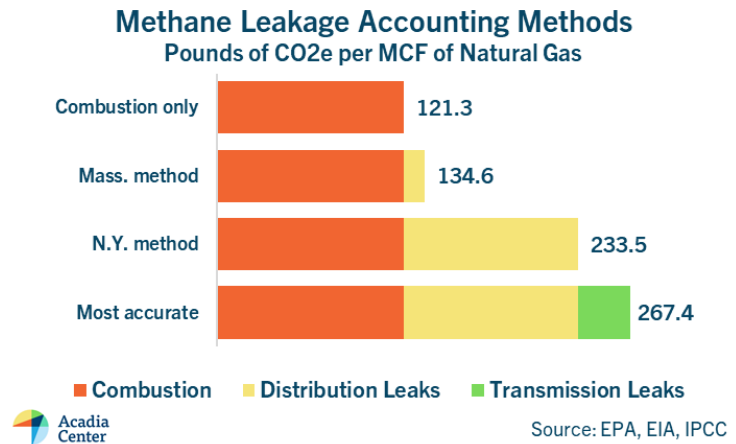
<sup>4</sup> Ivanenko, Alex. [“A Look At The ‘Colors’ Of Hydrogen That Could Power Our Future.”](#) *Forbes*, August 31, 2020.

methane leakage from the gas distribution system approaches 2.7% of all the gas that enters it.<sup>5</sup> This difference is equivalent to a 44% increase in the global warming potential (GWP) of natural gas relative to the EPA's values.

Additionally, the EPA's estimates—and, by extension, the Commonwealth's estimates—ignore all the methane leakage that takes place somewhere other than the distribution system. Compressor stations, transmission pipelines, production and processing facilities, abandoned wells, and storage tanks collectively emit 460 million tons of CO<sub>2</sub>-equivalent annually—seven times what Massachusetts emits each year across its entire economy. This leakage may not take place within the Commonwealth, but it takes place because of gas demand from the Commonwealth and other places like it.

The Commonwealth's GWP estimates for methane are also simply outdated, from a scientific standpoint. Massachusetts assesses the GWP of methane at 25 times the radiative forcing of CO<sub>2</sub> over a 100-year time frame; this estimate is from the IPCC's Fourth Assessment Report, which was released in 2007. The most recent Fifth Assessment Report recommends a global warming potential of 34 for methane.<sup>6</sup> Furthermore, accounting for the impacts of leaked methane on a 100-year time frame is misleading, as methane's impact occurs almost entirely in the first 20 years after release. The most truthful way to account for the GWP of methane is with the IPCC's recommended 20-year GWP of 86—a method that New York state recently adopted.

Ignoring these impacts and inaccuracies has made Massachusetts' greenhouse gas inventory less reliable. We fear that, without a more accurate accounting of emissions from methane leaks, Massachusetts may develop state policy based on incomplete or inaccurate information. New regulations or agency practices regarding leakage accounting would help to ensure that the Commonwealth remains effective and efficient in all its greenhouse gas reduction activities.



<sup>5</sup> McKain, Kathryn et al. "[Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts.](#)" February 17, 2015.

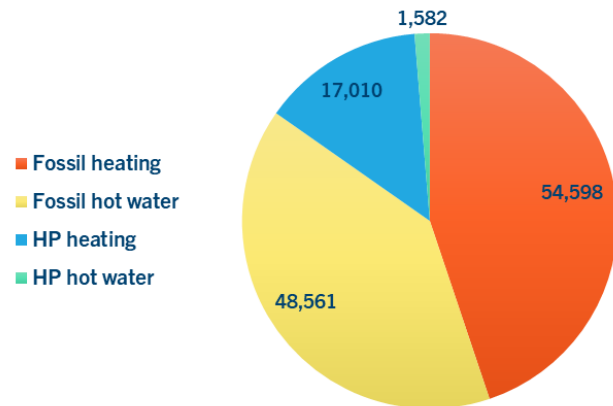
<sup>6</sup> Intergovernmental Panel on Climate Change (IPCC). "Fifth Assessment Report." [Chapter 8: Anthropogenic and Natural Radiative Forcing](#). P. 714 (Table 8.7).



**Recommendation 5: The 2022-2024 Plan must be designed with a gas phase-out in mind. To meet its climate commitments, the Commonwealth will need to slow and then stop the installation of new gas equipment in buildings. The 2022-2024 Three-Year Plan should be designed to start this process.**

According to Mass Save program administrators' benefit-cost ratio (BCR) models,<sup>7</sup> more than 54 thousand fossil fuel heating systems and more than 50 thousand fossil fuel water heating systems will have been installed in each year of the 2019-2021 Three-Year Plan.<sup>8</sup> Each of these heating systems will last well into the 2040's. All of these fuel-fired systems represent a missed opportunity to reduce emissions through whole-building electrification. To meet its climate commitments, the Mass Save programs should discourage the installation of new fuel-fired equipment starting now.

**Mass Save Equipment Installations**  
2019-2021 Plan: Average Per Year



Source: Mass Save BCR models

However, we recognize that ending incentives for efficient gas equipment in 2022, though highly desirable from a climate perspective, could lead to unintended consequences from an equity perspective. Gas energy efficiency programs also fund other measures—such as weatherization, Wi-Fi thermostats, and retrocommissioning—that cannot be said to lock in fossil fuel consumption in the way new furnaces and boilers do. It is particularly crucial that income-eligible programs prioritize weatherization and other fuel-saving measures that are not inconsistent with electrification, given the Green Communities Act's requirement that 20% of gas energy efficiency funds be spent on low-income households—a \$57 million investment in 2019.

The CECP anticipates that incentives for gas-fired equipment will cease starting in the 2025 plan year. The process of negotiating the 2022-2024 Three-Year Plan, which will take place this year, should be conducted with the knowledge of that sunset date in mind. Focusing gas ratepayer-funded programs on measures that do not lock in decades of emissions—most notably, weatherization upgrades that can reduce the capital cost of electrification—should be the overriding focus of gas program administrators in the 2022-2024 Plan term.

Finally, Mass Save program administrators, starting with the 2022-2024 Plan, should eliminate fuel-neutral consumer education materials in favor of educating their customers about the benefits of heat pumps and induction stoves. Educating the state's residents and businesses about electrification is a critical factor in ensuring that enough buildings electrify to meet the Commonwealth's targets set out in the CECP.

<sup>7</sup> The BCR models are available on the [Energy Efficiency Advisory Council's website](#). While the exact number of each measure may change during implementation of the Plan, the estimates in these models represent program administrators' best guess at the time the Plan was adopted in late 2018.

<sup>8</sup> Across all three sectors: residential, income-eligible, and commercial & industrial.



Acadia  
Center

### **Recommendation 6: The Commonwealth must consider natural gas' health impacts.**

**The Commonwealth should accurately and holistically account for the health impacts of maintaining or expanding natural gas infrastructure, and their associated costs.**

As the CECP recognizes, deep decarbonization will significantly improve air quality in environmental justice communities, helping to reduce health and economic disparities. Realizing these substantial benefits requires that the Commonwealth account for health impacts in all cost estimates and cost-benefit calculations related to energy infrastructure planning, in addition to the cost of long-term compliance with the Global Warming Solutions Act (GWSA).

Extending the life of the natural gas distribution system will ensure that negative health impacts due to air pollution will persist in frontline communities, who live closest to polluting fossil fuel infrastructure. Further evaluation and study could help to identify the degree to which extending the life of the gas distribution system will exacerbate health disparities in environmental justice communities.

### **Recommendation 7: Failure to plan will harm environmental justice communities.**

**The Commonwealth must provide realistic and well-publicized pathways away from natural gas for low-income and other marginalized households.**

More than 1.3 million households in Massachusetts currently rely on natural gas for space heating and water heating, including 55% of households receiving federal assistance and 52% of renters.<sup>9</sup> An unplanned collapse in the number of customers that the gas companies serve will lead to severe financial risks, which the most vulnerable residents will disproportionately bear.

We are seriously concerned that a building-by-building clean heating transition—such as the CECP envisions delivering primarily via consumer rebate programs—will increase inequity and lead to an unacceptable level of financial risk for low-income and otherwise marginalized residents of the Commonwealth. Currently, most electrification projects in both the buildings and transportation sectors take place at consumer request in affluent communities. As those with means disconnect from the gas distribution system, gas companies' rate base decreases, which increases fixed costs for the customers that are left over. This could lead to a death spiral, where the rising cost of heating with gas induces more people with means to electrify, leaving marginalized communities with excessively high energy costs. "Heat or eat" is already a common dilemma in winter for low-income residents of the Commonwealth; failing to plan for the decline of gas will exacerbate this injustice.

As the Commonwealth moves to transition away from fossil fuels in the coming years, policies and programs must be devised and adopted with these systemic factors in mind. Without a realistic pathway toward clean heating for low-income ratepayers, well-meaning climate policies risk harming the Commonwealth's poorest residents.

Thank you for the opportunity to offer these comments. We look forward to working with the Baker Administration to advance the Commonwealth's ambitious climate agenda by phasing out the use of natural gas.

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<sup>9</sup>U.S. Census Bureau. 2019 American Community Survey, 5-year estimates.



## SMART GROWTH AND REGIONAL COLLABORATION

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

The Metropolitan Area Planning Council (MAPC) appreciates the opportunity to submit the following comments on the draft Interim Clean Energy and Climate Plan for 2030 (CECP) released by the Administration for public comment on December 30, 2020. MAPC would like to thank the Administration for the opportunity to provide input at this critical juncture in the planning process.

As you know, MAPC is the regional planning agency serving the people who live and work in the 101 cities and towns of Greater Boston, which comprises roughly half of the state's population and two-thirds of the state's jobs. We are committed to smart growth, sustainability, regional collaboration, and advancing equity. MAPC has long recognized that making our Commonwealth more resilient to climate change for residents of all income levels will lead to healthier and stronger communities, and we have focused much of our work toward climate preparedness, adaptation, and mitigation.

Through our membership on the Global Warming Solutions Act Implementation Advisory Committee (GWSA IAC) since its inception and involvement on each of the sector-based GWSA IAC work groups (energy, buildings, transportation, and land use), MAPC is deeply involved in the implementation of the Global Warming Solutions Act and in forming the policy recommendations made to EEA for consideration in the Clean Energy and Climate Plan (CECP) update for 2030.

MAPC would like to first commend the Administration for making many of the necessary commitments to decarbonize our homes and businesses, connect our communities to renewable and clean sources of energy, and accelerate the adoption of carbon-free modes of transportation across the Commonwealth. MAPC would like to underscore our particularly strong support for the Administration's inclusion of the following strategies:

- Implementing the Transportation and Climate Initiative Program (Strategy T1).
- Requiring 100% Zero Emission Vehicle sales for light duty vehicles by 2035 (Strategy T2).
- Establishing a GWSA-compliant base building code by 2028 (Strategy B1).
- Imposing a statewide heating fuel emissions cap for buildings by 2023 (Strategy B3).
- Raising the Clean Energy Standard requirements for 2030 (Strategy E3).

The state's leadership on establishing a robust policy system of incentives and requirements to work toward net zero is essential to support both the state in attaining our 2030 and 2050 commitments and our cities and towns in achieving their local climate goals. In these comments, we wish to highlight the gaps and areas that merit strengthening within the draft CECP to ensure we can accelerate the Commonwealth's path to

an equitable and inclusive net zero future. In the final version of the CECP, MAPC strongly urges the Administration to:

- **Make equity and environmental justice central in each of the proposed strategies.** The effects of climate change systemically impact Environmental Justice communities and communities of color inequitably. While the CECP’s overview articulates a commitment to apply an equity and justice lens to programs and policies, the draft CECP lacks rigorous and measurable tactics and strategies to ensure an equitable and just transition to a net zero future. The Administration took a critical first step in this regard by including “climate change” within the state’s definition of environmental burden for Environmental Justice populations in Governor Baker’s proposed amendments to S.9, which have been retained in the final bill. This holistic consideration of the benefits and impacts on Environmental Justice communities should underpin all that is put forth in the CECP.
- **Enhance the role of public transportation and land use planning in achieving net zero.** Increases in vehicle miles traveled (VMT) across the state will increase greenhouse gas (GHG) emissions, and as those miles are electrified, increase demand for electricity. As such, improvements to public transportation and strategic land use planning decisions will play an important role in mitigating substantial increases to VMT and supporting the Commonwealth in achieving its net zero target. As with environmental justice, the plan should therefore include rigorous and measurable tactics and strategies to improve public transit infrastructure, increase the use of transit, bicycles, and walking, and encourage land use that is transit-oriented and lessens the demand for personal vehicular trips.
- **Include a comprehensive approach to build a green and equitable workforce.** Explicit policy actions that ensure a rapid and equitable expansion of the green workforce in Massachusetts are even more essential in the coming years as our state and national economies recover from the devastating impacts of the COVID-19 pandemic. The Commonwealth is poised to reshape the clean energy and climate industries, where women and people of color are currently underrepresented, through targeted measures to support economic advancement and access.
- **Advance policy to account for the social cost of carbon economy-wide.** Cost-effectiveness and least-cost solutions are underscored throughout the strategies proposed by the Administration. We instead need to shift our economic framework to appropriately account for the true cost of GHG emissions and assess the co-benefits of climate mitigation across all state decision-making processes.
- **Create a dedicated funding source to support climate mitigation efforts across the state.** Aside from the Transportation Climate Initiative Program, the draft CECP makes no mention of new funding sources or mechanisms to support agencies in moving forward with the policies and programs specified. Successful and just implementation of the CECP requires the identification of additional new sources of funding sufficient to meet the need.
- **Incorporate contingency plans to address the inherent uncertainties around the potential GHG impacts of each strategy.** There is consensus on the urgency of achieving the state’s targets for 2030. The sooner we act to dramatically reduce emissions, the more able we will be to avoid the worst impacts of climate change and provide the benefits of better air quality, better buildings, and less traffic congestion to all, and particularly those most vulnerable. Accordingly, the final CECP should reckon with how the Administration intends to be nimble and overcome unanticipated changes in the next ten years that may diminish the scale of emissions reductions.

The following comments specify MAPC’s recommendations within each chapter of the CECP and highlight areas that connect with these six overarching areas for improvement. We provide recommendations in the final section on potential funding sources for greater consideration.

## **Transforming Our Transportation Systems**

### **Role of Land Use and Transit**

Both the draft CECP and Decarbonization Roadmap (“Roadmap”) contain bold strategies for achieving ambitious goals for mitigating climate change through emissions reductions. Centerpieces of the plans include rapid electrification of the vehicle fleet, massive increases in renewable energy production, electric grid improvements, stronger energy efficiency standards, and deep building retrofits. With the emphasis on equity, robust scenario analysis, and stronger targets, there is much to admire about the Roadmap and CECP documents. However, MAPC strongly urges the Administrative to take a more comprehensive approach to transportation sector emissions reductions that appropriately addresses the role of land use and transit in mitigating climate change.

MAPC recently released a research brief entitled *The Impacts of Land Use and Pricing in Reducing Vehicle Miles Traveled and Transport Emissions in Massachusetts*.<sup>1</sup> The report describes our analysis of forecasted household VMT in the MAPC region out to the year 2030 under a baseline scenario, two alternative land use scenarios (sprawl and smart growth), and multiple roadway pricing scenarios. To conduct the analysis, we used our detailed land use allocation model, UrbanSim, to prepare census block-level household and employment forecasts, and another Vision Eval modeling tool called RSPM, which operates at a much more detailed level than the EERPAT model used by the EEA consultants.

Based on the results of our analysis and our other research on VMT reduction policies, we find the treatment of VMT in the Roadmap and CECP to be inadequate. The following sections detail MAPC’s primary concerns with the analysis and recommendations for comprehensively addressing VMT in the final CECP. EEA should revisit its analysis in the Roadmap and develop more robust VMT reduction strategies for the CECP.

***Dismissal of the Role of VMT in Reducing Emissions:*** The Commonwealth’s plans are predicated on rapid electrification of the vehicle fleet, which will reduce the per-mile energy demand due to the greater efficiency of electric vehicles, and production of sufficient renewable energy to power those vehicles with no net carbon emissions. This rapid fleet turnover will not be easy, or cheap – billions of dollars in subsidies may be needed. Notably, the CECP and Roadmap assume that this reduction in energy demand and GHG emissions can be achieved while still experiencing substantial growth in VMT from light-duty vehicles, 22.6% statewide and 25% in the MAPC region between 2015 and 2050.<sup>2</sup>

The Roadmap expressly dismisses efforts that seek to reduce transportation energy demand by reducing growth in VMT, choosing to rely solely on electrification of the fleet. Using the modeling tool EERPAT, EEA and its consultants evaluated the effects of density, improved transit, and roadway pricing. The results suggest that land use policies promoting greater density could reduce the growth in VMT by only 0.5 percentage points over 2015 VMT, and that a 10-cent VMT fee would reduce VMT growth by 7.6 percentage points over 2015. Ultimately, the Roadmap report concluded that VMT reduction was “limited in opportunity;” that land use policies would have only a “modest potential impact;” and that pricing

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<sup>1</sup> *The Impacts of Land Use and Pricing in Reducing Vehicle Miles Traveled and Transport Emissions in Massachusetts*, MAPC, January 2021, <https://www.mapc.org/resource-library/vehicle-miles-traveled-emissions/>

<sup>2</sup> “Transportation Sector Report: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study,” December 2020, page 41, <https://www.mass.gov/doc/transportation-sector-technical-report/download>

policies or transit improvements “would have to be substantial” in order to have an impact.<sup>3</sup> The Roadmap report concludes these strategies do not merit inclusion, even as complementary strategies.

The draft 2030 CECP takes a somewhat less dismissive approach regarding land use, retaining the “Smart Growth Policy Package” which has been a part of each CECP since 2010, and assuming a 25% reduction in single-occupancy vehicle commuting. The Smart Growth Policy Package (SGPP) consists of a range of activities, including technical assistance, infrastructure programs, and other unspecified “new, complementary policies.” To achieve a 25% reduction in commuter VMT, the CECP proposes “broadening the scope of [existing] regulation[s] or utilizing a complementary policy approach,” without further detail. Together, these policies are posited to “stabilize” light-duty VMT at about 56 billion miles per year, approximately 3% higher than the annualized figure for 2015 VMT reported in table 14 of the Roadmap Report. The CECP posits that implementation of the SGPP will reduce GHG emissions by 0.1 MMTCO<sub>2e</sub> by the year 2030, or 0.5% of the total light-duty vehicle GHG emissions in 2015. A reduction in single-occupancy commuting is projected to reduce light-duty emissions by 0.6 MMCO<sub>2e</sub> over the same period, or 3.5% of 2015 emissions. In other words, these two policies are together asserted to reduce VMT growth by 4 percentage points. The precise rationale or technical justification for the reduction attributed to the SGPP and commuter VMT reduction is not explained.

***Underestimation of Future Growth in VMT:*** While VMT growth is uncertain, it is almost certainly underestimated by the EEA analysis. EEA’s consultants estimated 25% growth in the Boston MPO region over the 35-year period from 2015 and 2050. MAPC’s analysis using more detailed land use forecasts and a more detailed version of the VisionEval modeling tool suggests much more rapid rates of VMT increase: a 21% increase in Boston MPO-region VMT over a 20-year period. This would roughly equate to a 42% in VMT for that same 35-year period. Our projections are much more consistent with historical trends, which show a roughly 25% increase in on-road VMT since 2000 (Transportation Sector Report, Figure 10.)

There are also many reasons to believe that future availability of autonomous vehicles will further accelerate VMT growth as they reduce the “time cost” associated with driving. While the COVID-19 pandemic has dramatically suppressed commuting for those who can work from home, and may have ushered in a new age of remote work, continued teleworking is by no means a foregone conclusion, and it is highly likely that the changes in commute VMT will be marginal or negligible, especially if flexible work schedules encourage workers to live in outlying areas with longer commutes. Furthermore, the CECP provides no clear policy mechanisms to achieve the targeted reduction in commuter VMT.

If VMT does increase more rapidly than forecasted by EEA, then the proposed rate of EV adoption and grid decarbonization will be insufficient to meet the transportation sector emissions reduction targets without additional, and costly, investments in EV subsidies and renewable production. While the number of additional EVs needed to close the gap may be relatively small, as the adoption rate target climbs, the marginal cost of each additional EV increases, reaching \$12,000 per EV.<sup>4</sup>

***Underestimation of the Effects and Benefits of Compact Land Use Patterns:*** EEA’s consultants estimated that compact land use patterns could reduce VMT growth between 2015 and 2050 by only 0.5 percentage points. MAPC’s analysis, conducted using more detailed land use forecasts and EERPAT analysis, indicates

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<sup>3</sup> Ibid, page 5.

<sup>4</sup> “Transportation Sector Report: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study,” December 2020, Table 9, <https://www.mass.gov/doc/transportation-sector-technical-report/download>

this is a substantial underestimate, especially when compared to a potential ‘sprawl’ scenario in which land uses become substantially more dispersed.

In the Metro Boston region, MAPC found that the VMT growth in a Sprawl scenario, in which suburbs see the majority of new growth, is over five percentage points higher than in a Smart Growth scenario, in which growth is more focused in the region’s Inner Core: 24.2% versus 19% growth over a 20-year period. Moreover, our modeling should be considered a conservative estimate of the effects of smart growth, since it does not target growth to specific transit-rich municipalities or transportation-efficient locations.

Compact growth can reduce VMT and emissions and can “eliminate the need for a trip altogether or by shifting the mode of travel from a personal vehicle to a shared vehicle or non-motorized mode such as walking or biking.”<sup>5</sup> Yet, other pathways through which compact growth can reduce emissions are not modeled or addressed in the Roadmap. Even if people do drive on occasion, compact growth can make trip lengths shorter. Amenity- and transit-rich locations can also enable more residents to live without owning and leasing a car, thereby averting all the energy and carbon embedded in a vehicle, especially one with a massive battery. As noted in the Roadmap report, septic systems are more emissions-intensive than modern wastewater treatment facilities are, and so locating more growth in sewered areas also reduces emissions. Sprawling land use has permanent impacts on the carbon sequestration potential of the affected land, impacts that last well beyond the 2050 horizon. Compact growth can also reduce building energy demand, a topic not addressed in the Roadmap or CECP. Multifamily housing has a more efficient building envelope and shared systems, enabling more cost-effective implementation of high-efficiency technologies during construction.

It is clear that the Administration understands the benefits of compact growth. Only two weeks after the Roadmap was released, Governor Baker signed the Economic Development Bond Bill into law, which included the Housing Choices legislation and a provision that requires all MBTA-served communities to provide zoning for multifamily housing by-right near transit. MAPC urges the Administration to include in the CECP not only the likely impacts of this newly enacted legislation, but also additional land use and transit-oriented development (TOD) policies that will reduce auto-ownership, boost transit ridership, and slow growth in VMT while also opening up new housing opportunities.

***Plan for Complementary and Multi-Benefit Pathways to Net Zero:*** While the Roadmap and CECP define pathways to meet the state’s emissions reduction targets, those pathways are dependent on many assumptions about technology and consumer behavior. Any deviation from the target EV adoption rates or availability of zero carbon electricity could cause the state to fall short. The analysis makes rather optimistic assumptions about when EVs will reach cost parity with internal combustion engine (ICE) vehicles. For example, battery electric vehicles are assumed to reach cost parity with ICE vehicles in 2023, fully 12 years before anticipated by the MA3T model. Failure of the auto industry to meet these vehicle costs may either suppress adoption or require even more subsidies to achieve target adoption rates. Only a small decline in ZEV adoption would likely cause Massachusetts to exceed its population-weighted share of imported bioenergy fuels.<sup>6</sup>

Given this uncertainty, the importance of VMT reduction is even more important. VMT reduction strategies can be effective at reducing emissions even when EV shares are still low.<sup>7</sup> VMT reduction also

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<sup>5</sup> Ibid, Page 39.

<sup>6</sup> Ibid, Page 13.

<sup>7</sup> Ibid, Page 46.

lowers the demand for clean electricity, helping to moderate prices and reduce the amount of generation needed. As noted in the Transportation Sector report, “reducing VMT supports ambitious decarbonization targets by easing some requirements in the electricity sector and by reducing emissions in interim years.” The CECP cites “Guiding Principles for policy development and implementation;” robust VMT reduction strategies fulfill all of these principles. **No matter the strategy, VMT reduction yields less congestion, fewer crashes and injuries, less polluted roadway runoff, less land for parking, and less demand for energy.** Strategies to achieve those reductions can have other co-benefits.

For instance, compact growth, especially near transit, not only reduces VMT, but also it enables more affordable housing and reduced transportation costs, improves efficiency of delivery services, and fosters active transportation. Roadway pricing reduces congestion and associated wasted hours, improves worker efficiency, and improves quality of life. Improved transit yields greater ridership, resulting in a virtuous cycle in which higher ridership prompts improved service benefitting transit-dependent populations. These are no-regrets strategies. Notably, they also can be implemented with public expenditures that are a fraction of the proposed investment in EV subsidies. They can also be designed equitably so that low-income and Environmental Justice residents are benefitted and not harmed by changes in land use, pricing, and transit.

***Invest in the State’s Public Transit System:*** Using pricing signals and developing more housing and job centers near transit will only be an effective pathway forward if we also have long-term investments in a robust, reliable, and affordable public transportation system. There is only one mention in the CECP of “maintenance and expansion of the Commonwealth’s public transit system.” **We strongly urge EEA to elevate the importance of investing in a robust, reliable, and affordable public transportation system in the final CECP.** In addition to electrifying the system, we must also increase frequency, ensure fares are affordable, and expand routes of our trains, buses, and ferries. The Governor’s own Commission on the Future of Transportation, in which MAPC was pleased to participate, noted that the “transportation system needs to move more people in fewer vehicles.”<sup>8</sup> The primary way to achieve this is to move more trips from single-occupant vehicles to public transit. By eliminating the need to take certain trips by car, investments in transit would not only reduce emissions, but also alleviate some of the pressure to rapidly electrify personal vehicles and lessen the strain on our grid.

### **Smart Growth Incentives and Policies**

The draft CECP’s goal of a 15% reduction in commuter VMT is an important first step. However, commute trips only represent about 25% of all trips taken in our region.<sup>9</sup> While we are eager to work with the Administration on a range of strategies to exceed this goal, we also urge EEA to think beyond telecommuting to achieve this reduction. The rapid and prolonged shift in our commuting patterns will likely have some level of permanent impact—some percentage of employees will almost certainly continue to work from home on a regular basis once we enter a new normal. Instead of focusing mainly on policy interventions that support more white-collar employees continuing to telecommute, efforts to achieve a reduction in VMT must also focus on employees who do not have the option to work from home.

Adjustments to the way we work are not the only economy-wide shifts impacting VMT and GHG emissions across the state. A report recently released by MAPC, *Hidden and In Plain Sight: Impacts of E-commerce in Massachusetts*, found that the rapid rise of e-commerce is having an impact on both VMT and vehicle GHG

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<sup>8</sup> <https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download>.

<sup>9</sup> [https://www.ctps.org/data/pdf/studies/other/Exploring\\_2011\\_Travel\\_Survey.pdf](https://www.ctps.org/data/pdf/studies/other/Exploring_2011_Travel_Survey.pdf).



emissions. As of 2018, approximately five percent of e-commerce was same-day delivery. Same-day delivery is forecast to increase to 15 percent within five years. A study by the World Economic Forum concluded that without policy intervention, the number of delivery vehicles will increase 36 percent from 2019 to 2030, along with a 32 percent increase in carbon dioxide emissions.<sup>10,11</sup>

In addition to impacting GHG emissions and transportation networks with increased vehicle traffic, the dramatic increase of e-commerce is also having major effects on land use. The pressure to maintain dependable and quicker delivery times has resulted in e-commerce companies adding smaller warehouse and distribution centers closer to consumers as part of their regional networks, a trend that shows no signs of changing.<sup>12</sup> The following sections identify a range of policy solutions the Administration can pursue to incentivize smart growth development and reduce VMT.

***Strengthen Existing State Programs to Increase Smart Growth Development:*** The Commonwealth already has programs in place to foster smart growth development, most significantly the Chapter 40R Smart Growth Overlay District program. Over the life of the program more than 50 districts have been created and approximately 3,800 residential units permitted/built. The Commonwealth should build upon this success by improving the program to increase its utilization and the quality of development. Some possible changes to 40R include:

- Simplify the program’s requirements and application process, reducing the cost and bureaucracy of establishing these districts.
- Clarify that the mission of 40R districts is not just housing production, but also to facilitate a broader range of smart growth principles, such as increased walkability and a sense of place.
- Enact a series of incentives to encourage the designation of larger 40R districts covering multiple parcels and the fuller build-out of these districts once designated. Many 40R districts are presently “one-offs,” created to facilitate only a single development.
- Increase funding for the program as well as 40S, the companion program, to account for increased costs associated with growth in the school-age population.

***Provide Municipal Resources to Prioritize Walkability and Affordability:*** Land use decisions largely fall to local governments. Through programs like the Housing Choice Initiative, the Administration has already created important incentives to encourage housing production aligned with smart growth principles. The Administration should build upon this effort by providing additional resources and incentives for municipalities to advance further improvements, including:

- **Reduce or eliminate minimum parking requirements for multifamily housing:** MAPC’s Perfect Fit Parking research found that the more off-street parking provided at multifamily developments, the greater likelihood the site will attract car-owning households.<sup>13</sup> Excessive off-street parking provisions undermine the goals of equitable transit-oriented development, spurring more driving and less transit use. They also drive up the cost of housing, create excess impervious surfaces, and

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<sup>10</sup> Miguel Jaller, Anmol Pahwa, Seth Karten, “Keeping e-Commerce Environmentally Friendly—What Consumers Can Do,” Blog post on U.C. Davis Institute of Transportation Studies, December 1, 2020.

<sup>11</sup> World Economic Forum, “The Future of the Last-Mile Ecosystem,” January 2020.

<sup>12</sup> Deloitte Real Estate, “The Shed of the Future. E-commerce: Its Impact on Warehouses,” 2014.

<sup>13</sup> <https://perfectfitparking.mapc.org/>.

reduce space available for other amenities like open space. The Commonwealth should take a more active role in helping cities and towns to reduce parking requirements within zoning.

- **Require that local zoning allow for mixed-used development in transit centers:** Equitable TOD is about creating complete communities near transit that allow for a mix of residential and commercial uses near transit, with an emphasis on creation and preservation of affordable housing. Local zoning should be updated to allow mixed-use development, including vertical mixed-use development (a mix of uses in the same building) and horizontal mixed-use development (a mix of uses across multiple buildings in a parcel). Site plan approval should incorporate principles that allow for walkability and foster a sense of place, such as sidewalks, safe pedestrian crossings, and roadway design that discourages high-speed vehicle travel.

***Expand the Role of Employers in Reducing Commuter VMT:*** MAPC was pleased to see the reference to broadening the scope of DEP's Rideshare Regulations in the draft CECP. The Administration could employ a number of strategies to strengthen this program, expand its reach, and help ensure measurable reductions in commuter VMT. Potential changes include:

- Reduce threshold to 500 applicable employees/students.
- Locate facilities within one mile of transit and pay for transit passes up to a certain dollar amount for employees, rather than just offering passes for purchase on-site. At a minimum, offer pre-tax transit benefits.
- Require membership in a Transportation Management Association (TMA) if in a TMA service area.
- Require employers to measure VMT, not just number of drive-alone commute trips.
- Replace the goal of reducing drive-alone trips with either a mode-shift or a VMT reduction goal.
- Require DEP to post reporting information online, with at least a summary of data gathered

***Allow Municipalities to Create Regional Mitigation Funds:*** A regional mitigation fund (RMF) is a mechanism used to levy and pool mitigation payments from multiple developments over time and sometimes across municipal boundaries. In Massachusetts, RMFs could serve as a mitigation requirement triggered by MEPA review or through local permitting processes. Funds should be prioritized for projects that will expand walking, biking, and public transit infrastructure in the Commonwealth. Mitigation payments from new development could then be used in high-priority development areas to ensure expanded bus service and other transit modernization without placing the financial burden of providing increased transit service on the MBTA or Regional Transit Authorities (RTAs). Similarly, RMFs could improve pedestrian and cyclist mobility by expanding trail networks.

***Require New Development Sites to Measure VMT Impacts and Use Local Data:*** MAPC recommends that the Administration require new development sites that trigger MEPA to measure transportation impacts based on VMT rather than level of service (LOS). Current development review practices characterize transportation impacts using inherently auto-centric LOS metrics, which describe vehicular flow and driver delay. Replacing LOS with a metric that measures the impact of driving will better align transportation impact analysis and mitigation outcomes with goals to reduce GHG emissions, encourage infill development, and improve public health through more active transportation.

MAPC also recommends requiring developers use local data to more accurately estimate trip generation and avoid overestimating impacts. To forecast trip generation as part of local and state permitting,

developers most frequently cite models established through the Institute of Transportation Engineers (ITE), which provides vehicular trip estimations based on a development's size and land use. However, the bulk of ITE's data is from suburban auto-oriented locations across the country with relatively unconstrained parking availability and primarily single land uses. As a result, ITE routinely overestimates trips generated by new development in Greater Boston by 25% to 35% or more. MassDOT should develop a database composed of local post-development trip counts to better forecast future trip generation rates and more accurately account for walking, biking, and public transit.

### **Transportation and Climate Initiative**

MAPC is deeply appreciative of the leadership that the Administration has demonstrated to advance the Transportation and Climate Initiative (TCI) among participating jurisdictions. We remain committed to continuing to partner with the Administration and to work with both fellow regional councils across the TCI region and our cities and towns to support robust and equitable implementation. TCI is one of several transportation revenue-raising efforts that the Commonwealth needs to pursue in order to build a robust, reliable, and resilient transportation system.

Now that Massachusetts has signed onto the final Memorandum of Understanding (MOU), there are several steps we can take to ensure TCI investments maximize carbon reduction benefits while serving residents who have historically been most burdened by transportation inequities. These include:

- **Increase the investment in underserved and overburdened communities:** The TCI MOU indicates that not less than 35% of TCI investments must benefit underserved and overburdened communities. We strongly urge the Commonwealth far exceed this threshold, with a majority of investments benefiting underserved and overburdened communities. Furthermore, we urge clarity about what it means for an investment to benefit these communities. We encourage the Administration to work with the Equity Advisory Boards to guide this distinction.
- **Empower Equity Advisory Boards (EABs) to guide program implementation and make investment decisions:** MAPC supports the creation of the EABs and endowing them with sufficient power to bring in voices from communities most impacted by TCI. The Administration should give the EABs decision-making authority regarding how the dollars are invested, whether investments benefit underserved and overburdened communities, and what interventions are needed should the program fall short of its equitable investment goals. EAB membership should represent all regions of the Commonwealth, and members should be residents of underserved and overburdened communities.
- **Program results and progress toward goals must be transparent:** MAPC strongly encourages the participating jurisdictions to publicly post the annual report and all metrics and goals devised in concert with the Equity Advisory Boards. Should the goals not be achieved, the annual reports should lay out steps that will be taken the following year to get back on track.

Finally, we encourage the Administration to continue its strong partnership with regional councils to guide successful implementation of the program. Regional councils conduct long-term transportation modeling that can help guide future investment decisions. We also serve as conveners and facilitators for our cities and towns, helping municipal officials work through challenges together. MAPC and our fellow RPAs are committed to work with you to advance robust and equitable implementation of the program.

## **Transportation Electrification**

MAPC strongly supports the Administration's commitment to adopting the Advanced Clean Cars (ACC) II regulations upon finalization by California that would commit the Commonwealth to ramp up Zero Emission Vehicle (ZEV) sales to 100% of new light duty vehicle sales by 2035. As we transition to electrify light-, medium-, and heavy-duty vehicles, it is vital that the Commonwealth's strategies simultaneously make this transition accessible to low- and moderate-income residents across the Commonwealth and a viable alternative for residents across all community types, whether urban, suburban, or rural.

***Equitable Access to Transportation Electrification:*** MAPC would like to see the Administration strengthen the commitment to a low- and moderate-income (LMI) consumer program for ZEVs to surpass investigation and commit to program development. This program should be designed in consultation with community partners by the end of 2022 (Strategy T3). At the request of EEA, MAPC has been convening a Ride for Hire Electrification Working Group to develop recommendations on how to support ride for hire drivers in electrifying their vehicles. The importance of developing complementary incentives to make electric vehicles an accessible option for LMI consumers has surfaced during the working group conversations with industry and advocacy stakeholders.

Recommendations to reach this goal include establishing a dedicated funding source for LMI consumer programs, creating a statewide program for low- or zero-interest vehicle loans, developing a program with auto dealerships to issue rebates at point of sale, and incorporating an option to purchase used ZEVs. Until robust incentives are implemented along with community outreach and education, the transition to electrify the light duty vehicle fleet in Massachusetts will continue to remain available only to those with means. There is overlap between LMI residents in the Commonwealth and drivers participating in the ride for hire industry (e.g., Uber, Lyft, and taxi and livery companies). As trips taken by transportation network company (TNC) drivers represent a growing segment of VMT in Massachusetts, it is increasingly important that we electrify these miles to achieve the state's net zero commitment. As such, MAPC recommends that the Administration consider an incentive structure that provides additional incentives for the replacement of high-mileage ICE vehicles with ZEVs.

***Accelerate Mechanisms to Deploy Charging Broadly:*** MAPC would like to underscore the Administration's acknowledgement of the need for revisions to our utility rate structures; these revisions are crucial to support the full-scale deployment of direct current fast-charging (DCFC) infrastructure and accelerate electrification of vehicles across the state. MAPC strongly urges the state to enact policy that would require the Commonwealth's Electric Distribution Companies to develop and put in place a rate structure for DCFC infrastructure by the end of 2022 that includes both time-varying rates and removal of punitive demand charges (Strategy T4).

MAPC supports the Administration's commitment to explore a utility-based residential charging incentive program. A particular challenge for more densely urban communities is the lack of access to off-street parking. MAPC recommends that any residential charging incentive program include mechanisms to support the deployment of on-street charging in partnership with municipal governments.

***Strategic and Equitable Consumer Awareness:*** Ongoing efforts of MassEVolves and Drive Green highlighted in the CECP have been foundational in promoting greater consumer awareness of EVs. MAPC would like to encourage the Administration to target consumer awareness toward dealership education and outreach and to education initiatives tied to the LMI program proposed in the CECP.

## **Transportation Network Companies**

Trips taken in rideshare companies, such as Uber and Lyft, are steadily increasing and significantly impacting our transportation system. In 2019, rideshare companies provided 91.1 million rides in

Massachusetts, approximately 12% more than in 2018 and 40.6% more than in 2017.<sup>14</sup> This increase has taken place statewide and in towns and cities of all sizes and types. A Fehr & Peers study<sup>15</sup> commissioned by Uber and Lyft estimated that additional miles driven while a driver waits for a ride request or is driving to pick up a passenger account for an estimated 40% of TNC vehicle miles in the Boston metro region.

However, TNCs are well positioned to help state and local governments meet pollution and emission reduction goals and increase use of ZEVs. Since ride-hailing vehicles travel more miles than personal vehicles do, a study by the University of California – Davis determined that replacing a gas-powered ride-hailing vehicle with an electric vehicle can deliver three times the carbon benefits of a personally owned electric vehicle.<sup>16</sup> MAPC encourages the Administration to implement regulations that discourage inefficient mileage, encourage EV usage, and require TNCs to establish climate-smart goals and targets. Such regulations are in effect in other cities and states. In San Francisco, for example, TNCs are required to pay a 3.25 percent tax on an individual ride, and the tax drops to 1.5 percent for a shared ride or a ride in a ZEV.<sup>17</sup> In California, with the enactment of the Clean Miles Standard and Incentive Program in 2018 (SB1014), GHG emissions-per-passenger-mile reduction targets for TNC providers will be set. Targets will include increasing passenger miles traveled using ZEVs, and TNCs must create plans on how they will meet these goals. Similarly, a proposed bill in Washington State would mandate reduction targets for TNCs.<sup>18</sup>

## **Transforming Our Buildings**

As the CECP notes, decarbonizing buildings is essential to complying with the Commonwealth’s emissions limits for 2030 and 2050. The transition to better buildings presents tremendous opportunities beyond GHG emissions reductions alone, from improving public health, strengthening local economies, and increasing resilience to extreme weather to redressing environmental injustices. Thousands of well-paying jobs and expanded workforce opportunities, lives saved through reduced pollution, and better housing developments will result from constructing and retrofitting our buildings to be green, healthy, efficient, and affordable. MAPC’s experience working to expand access both to clean energy and affordable housing across the Greater Boston region has shown us that the goals of mitigating climate change and addressing the housing crisis are not mutually exclusive. The Commonwealth must move quickly to facilitate this transition by massively scaling up its investments in the policies, programs, and incentives necessary in the near term to decarbonize the Massachusetts buildings sector by 2050.

### **Building Code**

MAPC applauds EEA for committing to a new high-performance stretch code with passive-house level efficiency for Green Communities by 2022 (Strategy B1). Yet, this does not reflect the full need from cities and towns. Massachusetts communities seek both a higher-performance stretch code for the existing stretch code, which over 80% of municipalities have adopted, and a code that they can opt into now, if they choose, that enables new construction to be built to net zero. In this, the net zero definition should be inclusive of high-performance buildings, which are constructed to meet robust energy efficiency requirements likely on par with Passive House standards, while also including the needed shift to electrification and renewable energy. Since many of the 288 cities and towns on the current stretch code

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<sup>14</sup> Department of Public Utilities, 2018 Data Report – Rideshare in Massachusetts. <https://tnc.sites.digital.mass.gov/>

<sup>15</sup> Estimated TNC Share of VMT in Six US Metropolitan Regions (Revision 1), Fehr and Peers, August 6, 2019.

<sup>16</sup> Ride-Hailing Electric Vehicles Offer Triple the Emissions Benefits, University of California – Davis, June 2020

<sup>17</sup> Traffic Congestion Mitigation Tax (San Francisco Business Tax and Regulations Code - Article 32) [https://codelibrary.amlegal.com/codes/san\\_francisco/latest/sf\\_business/0-0-0-48642](https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_business/0-0-0-48642)

<sup>18</sup> Uber, Lyft would Need to Cut Emissions under WA State Plan, Crosscut.com, February 1, 2021.

may not opt into the new net zero code for several years, the new opt-in net zero stretch code pathway for all new construction should be available in addition to an updated existing stretch code in 2022.

MAPC further commends EEA for proposing to consolidate the higher-performance opt-in code into the base building energy code by January 1, 2028 (Strategy B1). We are supportive of integrating the opt-in high-performance net zero code pathway into the base code by this date. As noted, MAPC contends that the existing stretch code should also improve between 2022 and 2028. This progress would send the needed market signals and enable a smoother transition to the base code update by 2028. Moreover, it would address the demand by stretch code cities and towns for the stretch energy code to be updated at the same rate that the base building code as well as the International Energy Conservation Code are. MAPC therefore recommends that, by 2025, the updated stretch code should be consolidated with the new net zero opt-in code pathway into one net zero stretch code that replaces the basic stretch code and does not require an existing stretch code or net zero code municipality to re-adopt it. By 2028, we recommend that this - or an updated version - become the base building code, thereby aligning with the timing put forward in the draft CECP. Such code pathways and accelerated timelines are both feasible and necessary in order to reach high levels of energy efficiency, electrify buildings, and maximize renewable energy, either onsite as practical or offsite.

### **Benchmarking and Building Performance Standard**

As the majority of the 2.5 million buildings in Massachusetts will still be standing in 2050, the need to decarbonize existing buildings is critical (Strategy B2). The Building Sector technical report asserts that heat pumps must be adopted in at least one million households and 300 to 400 million square feet of commercial buildings by 2030.<sup>19</sup> Current incentives and program structures are not sufficient to achieve the deep energy savings called for in the CECP, and existing buildings are by far the greatest challenge in decarbonizing the sector that we will confront. MAPC recommends establishing a strong building energy and emissions benchmarking requirement and building performance standard statewide. This action will enable buildings to meet a declining heating fuel cap while accelerating the shift from fossil fuels to energy efficiency, electrification, and renewables. Rather than exempting certain building types, uses, or populations, the state should provide ample funding, financing, resources, and technical assistance to support all community members, especially low-and-moderate income and Environmental Justice communities, to reap the benefits of better, more resilient, healthier buildings as soon as possible, looking to the models of Energiesprong and RetrofitNY as starting points.

### **Energy Efficiency Programs**

Reducing building emissions by at least 45% by 2030 and to net zero by 2050 will require a major transformation of markets (Strategies B1 and B2). Reaching our climate goals and avoiding the worst of climate change necessitates a paradigm shift from our fossil fuel-driven present to a clean energy future. The Mass Save program is one of the most important tools available to reduce emissions from buildings, new or existing, and it is cited throughout past and current CECPs. However, the current statutory and regulatory frameworks in which the Mass Save program is administered create barriers to alignment with GWSA goals. We know this firsthand from our appointment on the Energy Efficiency Advisory Council representing Commonwealth cities and towns. We were pleased to see and fully support the strategy to limit fossil fuel incentives in the 2022-2024 Three-Year Energy Efficiency Plan and eliminating them completely in the

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<sup>19</sup> "Building Sector Report: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study," December 2020, <https://www.mass.gov/doc/building-sector-technical-report/download>

2025-2027 plan (Strategy B1). This will require not just DOER, but also leadership, support, and guidance from EEA and cooperation from DPU.

To reach this objective, the CECP wisely relies heavily on heat pumps to achieve its goals, referencing the need to install at least 100,000 per year on average in residential dwellings plus a large number in commercial spaces. The current Three-Year Energy Efficiency Plan for 2019-2021 aims for roughly 15,000 heat pump installations per year. The gap is notable. We recommend that the final CECP and subsequent policies demonstrate how the state will achieve the annual level of heat pump installations needed. The plan put forth should be clear, begin early, and transparently chart out progress with benchmarks and milestones for success, and alternate pathways if installation levels lag. Additionally, we urge EEA to institute sufficient training, education, and incentives to enable whole-home conversions that do not retain back-up systems.

To support clean heating and cooling, and many other benefits, our buildings must have robust and deeply energy efficient envelopes and enclosures. During the pandemic, the Mass Save Program Administrators initially offered no-cost weatherization, an offer that continues for moderate-income customers and renters. In addition to preserving this offer in future plans, we recommend that Mass Save additionally offer the 100% incentive for weatherization to buildings that agree also to electrify their space heating or water heating equipment. Moreover, we urge full funding for pre-weatherization and pre-electrification barrier mitigation for low-and-moderate income customers and Environmental Justice communities.

### **Cap on Heating Fuel Emissions**

MAPC applauds EEA for proposing the heating fuel emissions cap (HFEC); it is essential to reaching the 9.4 MMTCO<sub>2</sub>e reduction in emissions from buildings by 2030 contained in the draft CECP, the largest cut by sector (Strategy B3). In order to ensure that the critical role that the HFEC will play is effective and expedient, DOER should convene the Commission on Clean Heat and Task Force on Clean Heat by June 2021 in order to meet the CECP's timeline of recommendations on the "structure and levels for long-term emissions caps on heating fuels consistent with the findings of the 2050 Roadmap, the 2030 emissions limit, and this plan" by the end of 2021 and the "statutory, regulatory, and financing mechanisms needed" by end of 2022 (CECP, page 33). Moreover, the two bodies must be endowed with a strong mandate that enables them to implement the cap beginning in 2023, with declining cap levels over time.

With these declining caps, we must not miss the opportunity to utilize the likely revenue collected through alternative compliance payments or fees once the caps are in effect to equitably protect low- and -moderate income people and Environmental Justice communities. For both owners and renters, rebates, incentives, and technical assistance must be made available to support them in making their buildings more energy efficient and in converting their heating to non-fossil fuel systems, particularly in rental properties. To this end, the cap must be structured to drive fossil fuel customers toward no- or low-carbon renewables and to phase out fossil fuel combustion in buildings. Fossil fuel use in buildings, even blended fuels, risks extending the life of fuel oil and propane infrastructure and the gas distribution system, leading to billions of dollars of leak and age repair and resulting in stranded assets funded by ratepayers.

The Commission must likewise be empowered to design the complementary policies, incentives, and regulations that are needed to decarbonize existing buildings, including development of a statewide building performance standard, benchmarking and disclosure requirements, and significant funding and technical assistance for low-and-moderate income building owners and Environmental Justice communities. While we have witnessed firsthand the interest in advancing policies such as these at the municipal level, we

strongly encourage the state to leverage the impactful scale and reduced barriers that result from coordinated statewide policy.

### **Workforce Development and Upskills Training**

Transitioning the buildings sector to a decarbonized future requires training workers in deep energy efficiency measures and climate-smart building technologies, especially related to HVAC, onsite solar, building operations, and heat pumps. The expansion of this industry offers tremendous opportunities for the creation of thousands of long-term, sustainable, good paying jobs installing and maintaining new technologies. However, Massachusetts' current workforce is ill-equipped for this challenge, both in terms of numbers and diverse representation.

Key demographics, including people of color and women, are underrepresented in the current workforce, and minority, women, and disadvantaged business enterprises (MWDBEs) are consistently excluded – unintentionally or not – by the structures presently in place. Our transition to a decarbonized building sector will also likely displace workers from fossil fuel-related jobs, and the Commonwealth must plan for retraining these workers to participate in the clean energy economy. MAPC agrees with the Administration's acknowledgement of workforce availability as a potential barrier to adoption of the clean energy solutions necessary to decarbonize our economy, and we encourage the Commonwealth to seize the opportunity to address workforce shortages while also redressing current inequities in workforce representation and access to economic opportunity in the clean energy sector (Strategy B2).

### **Embodied Carbon**

The manufacturing of many construction materials is inherently carbon-intensive, including many foam products used in high-performance buildings. Too many carbon-intensive decisions can create a building with a multi-year carbon debt that delays the project's contribution to our net zero carbon goals. MAPC recommends that considerations for embodied carbon for new buildings be integrated within the net zero code pathway, relevant Mass Save initiatives, and other pertinent utility and state programs, and that appropriate regulations to this effect be promulgated by mid-decade (Strategies B1 and B2).

### **Transforming Our Energy Supply**

MAPC strongly supports the Administration's commitment to increase the Clean Energy Standard (CES) requirements to at least 60 percent by 2030 (Strategy E3). Deep decarbonization of our energy supply is the backbone to achieving near-term emissions reductions across sectors as we seek to electrify our transportation and heating and cooling systems. As such, MAPC would like to recommend that the Administration increase its commitment of 60 percent by 2023, and 100 percent by 2030 under the CES. Additionally, MAPC strongly recommends that the Administration address the IAC Electricity Work Group's recommendation to construct a strategy review and alignment of the RPS, APS, CES, and CPS regarding the participation of biomass, landfill gas, and municipal solid waste "waste-to-energy" generators.

### **Equity and Clean Energy Workforce Development**

As the Commonwealth transitions to a fully decarbonized energy supply, our strategy needs to support both a just transition and equitable access to the benefits of this transition. Across all six strategies included in the draft CECP for the energy sector, MAPC strongly encourages the Administration to incorporate the recommendations from the IAC Climate Justice Working Group regarding accountability, transparency,



and inclusion of EJ populations in the decision-making processes.<sup>20</sup> In particular, MAPC recommends that the Administration include tactics within its efforts to deploy solar in Massachusetts in order to expand the deployment of microgrids and renewable energy cooperatives that serve EJ populations.

***Ensure Equitable Siting Practices:*** MAPC encourages the Administration to commit to develop a transparent process with robust community involvement to inform the siting of new transmission or energy-related infrastructure (Strategy E5) and distribution system changes (Strategy E6). This, paired with the incorporation of the social cost of carbon into state decision-making processes, should aid in protecting against disproportionate siting of facilities in EJ communities and ensuring that related cost savings and health benefits result for EJ communities.

***Grow an Equitable Clean Energy Workforce:*** The expansion of the clean energy industry in Massachusetts will continue to offer expanding economic opportunities for a growing green workforce. As the Commonwealth executes large-scale procurements (Strategy E1) and expands the solar and wind markets (Strategies E4 and E5), MAPC sees this as a fundamental opportunity to connect MWDBEs with these growing economic opportunities and increase representation within the clean energy industry. MAPC strongly encourages the Administration to include provisions within the final CECP that commit to developing equitable procurement practices and bolstering workforce and market development resources to greatly expand the participation of MWDBEs in the clean energy economy.

### **Solar and Wind Development**

The draft CECP commits to executing existing solar programs and wind procurements and supporting “on pace” deployment of clean energy. MAPC recommends that the Administration further define what “on pace” means for Massachusetts and make bold commitments to maximize the deployment of solar and accelerate offshore wind development by 2030. While we are deeply supportive of the state’s existing commitments to accelerate the deployment of renewable energy resources, we strongly urge the Administration to exceed these commitments to ensure our best chance of mitigating the worst impacts of climate change and commit to a goal of 10 GW of installed solar capacity by 2030.

Bold commitments to accelerate solar and wind deployment should be paired with appropriate siting practices that minimize the use of greenfields. MAPC recommends the development of a statewide geospatial plan for siting solar, determining what is feasible on specific sites, and eliminating barriers to building on brownfields and other multi-benefit co-uses.

### **Grid Modernization**

Regional coordination on electricity system planning across the ISO New England states and collaboration across Massachusetts agencies and departments on grid modernization is fundamental to achieving a decarbonized and resilient energy supply. However, MAPC is concerned that the draft CECP, and consequently the projected emissions reductions for 2030, may be over-reliant on regional processes, like the New England States Committee on Electricity, to make substantive progress. MAPC encourages the Administration to identify tactics now to ensure grid resiliency and reliability and provide market-based incentives for energy supply decarbonization. In particular, MAPC would like to see a more aggressive

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<sup>20</sup> The IAC Climate Justice Work Group’s memo providing recommendations to improve the IAC’s 2019 list of recommended policies can be accessed at <https://www.mass.gov/doc/climate-justice-working-group-policy-recommendations/download>.

commitment to incorporating GWSA compliance into distribution-level policy decisions (Strategy E6) in the near term. MAPC recommends requiring substantive implementation of grid modernization efforts by DPU, DOER, and EEA by 2025, and comprehensive electric and gas utility reform ideally by mid-decade and by no later than 2030.

### **Mitigating Other Sources of Emissions**

The CECP acknowledges the importance of reducing emissions from methane leaks from the natural gas distribution network and suggests that existing policies such as MassDEP's Reducing Methane Emissions from Natural Gas Distribution Mains and Services regulation will be sufficient. While DEP and the gas distribution companies deserve credit for the strides that they are making to replace leak-prone pipes, calling for emissions to remain steady misses a critical opportunity to accelerate this progress. The pace of pipe replacement under the utilities' Gas System Enhancement Plans (GSEPs) should be accelerated, and the utilities should be required to prioritize "super-emitting leaks" – the 8% of leaks which make up nearly 50% of total emissions – to improve the safety of the system while significantly reducing emissions from leaks by 2030.

Just as the CECP acknowledges the current DPU investigation of the future of the natural gas industry within the buildings section, so too should the plan reflect the inherent tension between our transition to clean heating fuels and the infrastructure and systems in place that support the current energy economy. Continued investments in natural gas infrastructure, like those called for in the utilities' GSEPs, may reduce emissions in the short-term. However, they may also lead to unnecessary expenditures of ratepayer funds for pipes that become stranded assets in the near future. The CECP should acknowledge the importance of mapping a pathway away from all fossil fuels, including natural gas, as soon as possible and with minimal impact to ratepayers, residents, and businesses.

### **Protecting Our Natural and Working Lands**

Reducing fossil fuel emissions is the number one strategy in our fight to mitigate climate change. Preserving and increasing the capacity of land to sequester and store carbon is therefore critically important. Natural and working lands also provide important climate resilience and other co-benefits, including cooling and shade, clean air and water, flood protection, production of food and fiber, and recreation, scenery and quality of life. The Commonwealth should accurately and effectively leverage natural and working lands as a part of the state's climate change strategy using best management practices aligned with international standards for carbon accounting and GHG inventories.

It is vital that the Commonwealth's climate change strategy include provisions to preserve and increase the presence of healthy and mature street trees and the urban tree canopy overall. MAPC urges the Administration to establish a goal for the planting and preservation of a specific number of urban and suburban trees by a certain date, with a focus on EJ communities, along rivers, streams and meadows (Strategy L1). To aid the expansion of the urban tree canopy, MAPC further encourages the state to identify priority locations in EJ communities to convert impervious surfaces to green spaces. The reduction of gas leaks from leak-prone pipe will further enhance the preservation of street trees, enabling them to support urban GHG reductions and improved air quality.

MAPC also recommends that the Administration allocate a set amount of funds for climate adaptation projects that create public health benefits in EJ populations (Strategy L2). Current formulas and pending legislation are based on property value instead of minimizing harm from extreme weather events, climate

change, and air and water quality. The cost-benefit formula of adaptation measures should consider public health benefits, reduced heat island impacts, reduced flooding damage, and prioritization of EJ populations.

### **Funding Options to Advance Climate Mitigation and Resiliency**

The Commonwealth will need to utilize a suite of funding mechanisms to ensure a swift and equitable transition to net zero emissions. While the draft CECP importantly identifies TCIP as a funding source for some of the investments we will need in the future, a range of other tools must be deployed and at the ready. This includes sector-wide carbon pricing, building off the TCIP framework.

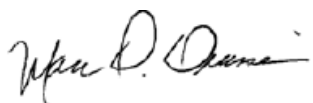
One proposal currently before the Legislature is *An Act providing for climate change adaptation infrastructure and affordable housing investments in the Commonwealth*, filed by Representative Nika Elugardo (HD.1252) and Senator Jamie Eldridge (SD.611). This legislation, also known as the Housing and Environment Revenue Opportunities (HERO) bill, is modeled after the Administration's S.10 proposal. It would increase the real estate excise tax to fund climate and housing needs, and likewise deserves the Administration's support.

An additional mechanism to undertake is the creation of a Climate Bank, which could provide capital for several of the infrastructure investments, upgrades, and systems identified as necessary in the draft CECP. The Climate Bank could be established and initially capitalized by the Commonwealth or through federal recovery funds. This mechanism could include debt financing, where appropriate paybacks exist, for measures related to clean energy, transit, and water infrastructure and technology investments, and institute a revolving loan fund and other financing tools where paybacks can be more challenging. Substantial funding and financing, from the state directly and indirectly, will be required quickly and at scale to advance deep energy retrofits, long-duration battery storage, district heating and cooling, and other large-scale decarbonization and resiliency measures. The Climate Bank should prioritize funding innovative, emerging, and transformative climate and energy technologies and programs as well as regional or multi-municipal resilience infrastructure, both green and grey, especially in Environmental Justice communities.

Regardless of the funding options pursued, we encourage the Administration to structure these mechanisms in a way that minimizes the impact on low-income individuals and maximizes investments that prioritize underserved and overburdened communities.

Thank you for the opportunity to provide comments and for the Administration's consideration of our recommendations. MAPC looks forward to continued collaboration with the Administration on its efforts to achieve net zero emissions by 2050 and to make great progress toward this commitment by 2030. We would be particularly interested and well suited to continue our leadership on building decarbonization and resilience as a member of the Commission on Clean Heat. Please contact Rebecca Davis, Deputy Director ([rdavis@mapc.org](mailto:rdavis@mapc.org)), or Cammy Peterson, Director of Clean Energy ([cpeterson@mapc.org](mailto:cpeterson@mapc.org)), with any questions or for further discussion regarding MAPC's comments.

Sincerely,



Marc Draisen  
Executive Director



Rebecca Davis  
Deputy Director

# MASSACHUSETTS FOREST ALLIANCE

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March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
626 E Wisconsin Ave  
Milwaukee, WI 53202

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Secretary Theoharides:

The Massachusetts Forest Alliance (MFA) represents forest landowners, foresters, timber harvesters, and forest products companies in Massachusetts. We applaud the efforts of EEA on the Decarbonization Roadmap and the Clean Energy and Climate Plan for 2030 and recognize the major effort that the creation of these documents entailed. We believe our members can make valuable impacts on the Commonwealth's ambitious climate change goals, and we stand ready to provide support, feedback, and assistance.

We were glad to see that the CECP recognizes the significant science behind mass timber construction. We need 185,000 housing units just in greater Boston by 2030. Building some of these using mass timber technology can represent a major carbon emissions reduction – both in lower embodied carbon in raw materials and in the carbon that continues to be stored in the mass timber panels used for construction – as much as 50% of the dry weight of the wood.

We have concerns about some of the policy recommendations in the Healthy Soils Action Plan, which we don't believe are well-supported by science and could have a devastating effect on forest landowners and timber harvesters. That plan still has not been publicly released and we hope you will consider accepting public comment on it and carefully consider the science and economic effects of potential policies stemming from it.

We are strong believers in the science supporting modern wood heat – from the state-funded research in the *Manomet* report to peer-reviewed journal articles – that show a significant carbon saving by offsetting fossil fuels with modern wood heat. These automated boiler systems run on wood pellets or dried wood chips largely made from sawmill residues, which have an extremely favorable carbon profile. The Massachusetts Clean Energy Center's [GoClean website](#) offers details of the major carbon savings realized through modern wood heat compared to fossil fuels.

While the CECP quotes the Decarbonization Roadmap about carbon being released from burning wood, it neglects to include the two sentences that follow in the Roadmap, which contain the important qualifier that science shows that using modern wood heat to offset fossil fuel use can *reduce* overall emissions.

*Advocating for a Strong, Sustainable Forest Economy*

This is a curious omission in the CECP, and we would encourage you to clarify the science in the final version.

As for concerns around pollution from modern wood heat, a UMass Amherst air-sampling study showed that modern wood heat systems (which emit 99% less particulate emissions than an older wood stove) have comparable or better emissions compared to the oil systems they replaced, and the emissions are likely less toxic. Add an emissions control device such as an electrostatic precipitator, and you can reduce the remaining particulate emissions by an additional 98-99%, making them super-clean.

We hope that the Commission on Clean Heat and/or the Task Force on Clean Heat will follow the science and continue the support of modern wood heat found in the Alternative Portfolio Standard.

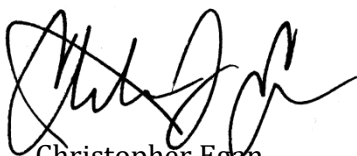
We have also been concerned about representation in the state's climate change planning. While forests are a key part of climate change planning, and the CECP recognizes that the majority is held by private landowners, there has been little to no representation from those that work in the forest or from private landowners, with the exception of large nonprofit organizations that own tens of thousands of acres and who have little in common with families that own 200 acres of forestland.

The CECP calls for practice-based forest management programs designed to increase forest resilience and improve carbon storage. But these programs are meaningless without licensed consulting foresters and licensed timber harvesters to apply them to privately-owned forestland and carry out management to achieve the goals. If we want these experts to be available to conduct the work, we have to pay attention to the economics of forest management and the human capital needed to enter the field.

We believe having foresters, harvesters, and family forest landowners as part of planning groups would help EEA make better-informed decisions with the full picture of how policy choices affect the long-term sustainability of forests and the economic impacts on rural areas, which are often glossed over. We hope you'll consider broadening your reach with groups such as the GWSA Implementation Advisory Committee and others to include this representation.

Thank you for the opportunity to comment on the CECP.

Sincerely,

A handwritten signature in black ink, appearing to read 'Chris Egan', written in a cursive style.

Christopher Egan  
Executive Director

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March 22, 2021

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Via gwsa@mass.gov.

Re: Interim Clean Energy and Climate Plan for 2030 (December 30, 2020)

**Pursuant to the request of the** Secretary of Energy and Environmental Affairs for public comment “particularly on the specific ‘strategy actions’ identified in the Plan for each major sector of our economy” (December 30, 2020), this is the Comment of the Low-Income Energy Affordability Network (LEAN) and the Massachusetts Energy Directors Association (MEDA), collectively “The Network.” It is focused on low-income aspects of heating in the Building sector and a related portion of the Transportation sector.

The Low-Income Network offers these Comments in the spirit of looking forward to working with the Secretary and stakeholders to support the Plan’s goal “to equitably and cost-effectively reduce GHG emissions through 2030” (at 6, see 5, 10-11), including designing policy around “how to insulate low- and moderate-income consumers from excessive cost burdens” (14).

#### The Low-Income Network

G. L. c. 25, sec. 19(c) (Green Communities Act, St. 2008, c. 169, sec. 11) provides that “The low-income residential demand side management and education programs shall be implemented through the low-income weatherization and fuel assistance program network and shall be coordinated with all electric and gas distribution companies in the commonwealth with the objective of standardizing implementation.” LEAN is the organization of agencies that make up the low-income weatherization and fuel assistance program network that implement programs under the Act in coordination with Program Administrators (MassSave), including

distribution companies. MEDA is the organization of energy directors of those agencies.

The Network serves low-income utility customers, many of whom are people of color. Members of the Network counsel electric utility customers about low-income energy efficiency programs, rates and payment options, and arrange rate payment assistance (including LIHEAP, discount rates, arrearage management, and other forms of assistance) for customers. As reflected by sharply increased low-income arrearages, the low-income customers served by members of the Network and MEDA are currently having an especially difficult time paying their bills. This is expected to be exacerbated by the scheduled end of the moratorium on disconnections for nonpayment on July 1, 2021.

The Commenters have a substantial interest in this proceeding because the efficiency, weatherization, education, assistance, and counseling services they (or their members) offer are dependent on or affected by the outcome of this proceeding. Petitioners are also substantially affected by this proceeding because their clients (or those of the Network's members) depend on the aforementioned efficiency, weatherization, education, assistance, and counseling services, which will be determined or affected by this proceeding. Further, Commenters are substantially affected by the level of electric utility rates and bills because (a) their clients (or clients of their members) are more likely to require assistance as rates and bills rise, (b) the efficiency, weatherization, education, counseling and payment assistance services they (or their members) offer are less likely to result in affordable utility bills for their clients as rates and bills rise, (c) they (or their members) will be increasingly called upon to secure other means of assistance with utility bills as rates and bills rise, (d) they (or their members) will be increasingly called upon to assist clients who have had utility service terminated for non-payment, (e) they will be called upon by their members to assist them in helping members' clients as rates and bills rise, and (f) the efficiency and weatherization services needed to reduce bills, pursuant to Green Communities Act and other energy efficiency programs implemented by the Commenters, may be substantially affected by the rate change proposed in this proceeding. Commenters also represent the interest of their (or their members') clients in reasonable and stable rates that they can afford to manage and pay; clients are substantially affected by rates and bills that they cannot afford to pay because they are unreasonably high.

#### The Low-Income Network Energy Efficiency Programs

The Network has begun, in part with CEC funding, a program of installing whole-house air source heat pumps (ASHPs) in low-income single-family (including two-to-four units) and installed more than 4000 units (including those in-process) in low-income multi-family buildings, displacing existing electric resistance and oil heating systems. Installations include full weatherization and pre-weatherization measures where not already installed. A foam injection measure is under active development for masonry buildings. Alongside, a Strategic Weatherization program is under development to make low-income buildings ASHP-ready.

This is part of the Network’s comprehensive “quarterbacking” approach to low-income homes that includes soup-to-nuts general contracting service, 100% quality control, and no customer payment. The program reached, for example, 260,000 households in the period 2010-2018; 84% of them renters in 2019. The program has reached 84% of all state-identified low-income housing units in the Commonwealth, including all Public Housing Authorities. In most cases where The Network did not install ASHPs, it will be able to return to install them.

Workforce development is an important support for the low-income energy efficiency programs. In the year before the pandemic (2019), 79% of Low-Income Network workforce training graduates were hired by contractors -- 89% of them people of color, 59% Spanish-speaking.

### Building sector

The draft Plan notes the Roadmap goal of 60%-95% electrification by 2050 (at 27) and proposes a 48% decrease in emissions by 2030, primarily by adoption of electrification and envelope improvements (28), especially in oil-heated homes (30). Relying largely on MassSave (31) and an enhanced cost-benefit structure (32), tactics include focusing on equipment turnover points (28); targeted low- and moderate-income incentives, including for pre-weatherization measures (31) (i.e., repairs, such as replacements of deteriorated roofs, required as a pre-condition for effective weatherization (which includes insulation, air sealing, and windows); “ending all [MassSave] fossil fuel heating system incentives by the end of 2024” (31); and “Zero up-front capital solutions for low income and affordable housing residents.” (33).

Recognizing the current limited number of whole house HVAC installers (28), the Plan proposes to “refine and enhance workforce development programs related to building decarbonization and will investigate the need for air source heat pump certification and workforce training.” (31)

These are sound strategies in our view, provided they account for key differences between low- and moderate-income households and the majority of Massachusetts residential households, including:

\* For a low- or moderate-income household, lacking disposable income (by definition), “turnover” of heating equipment happens when the equipment becomes inoperable, so --

^ the opportunity to replace a heating system is most often a no-heat emergency without the luxury of the days it takes to design and install a whole-house heat pump system,

^ therefore a strategy in the low- and moderate-income sector cannot wait for natural “turnover” but rather must focus on a proactive approach to retrofitting systems before they fail,



^ incentives for low- and moderate-income customers need to involve no customer payments and be at sufficient scale to meet the Plan’s ambitious targets.

\* “Households ... currently using natural gas for heat may see marginal [sic] cost increases in the near term that in most cases can be fully offset by future operating cost savings.” (28) This is not a sound low-income financial strategy, for exactly the reason pointed out in the Plan -- “This consumer cost discrepancy is of particular concern regarding low-income households, where any increase in energy cost, even if temporary, has the potential to result in financial hardship.” (at 28) Thus:

^ The Plan’s unquantified assumption that “cost increases in the near term that in most cases can be fully offset by future operating cost savings” (28) does not address the realities of low-income economic life, which does not permit this kind of sophisticated financial planning.

^ The Plan’s observation that “Despite potential near-term impacts for current natural gas customers, widespread deployment of heat pump systems will translate to overall societal cost savings in the coming decades” (28) does not produce affordable low-income gas heating bills.

\* The scale of the unfunded retrofit opportunity is immense. Our preliminary analysis of a program just ***to replace every low-income fossil-fuel system, and weatherize every low-income home not yet weatherized, with current MassSave and federal weatherization budgets would require \$4.7 billion and 25 years (oil and propane) to 50 years (gas),<sup>1</sup> i.e., to 2046-2071.<sup>2</sup>***

^ Low-income households do not possess any of this funding.

^ The Plan’s goal of removing support for all fossil systems by 2024 (31) is inconsistent with any reasonable timeline for replacing low-income heating systems. As noted, current funding cannot reach all oil low-income oil systems until 2046 and gas by 2071. Alternatively, the expectation that biofuels, renewable natural gas, and/or hydrogen (33) can be ready at scale by 2024 is, at best, uncertain and certainly unproved.

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<sup>1</sup> The Plan does recognize that “There is not a one-size fits-all solution, and not every building in Massachusetts can currently be cost-effectively electrified. Nevertheless, the current level of natural gas use for building heating and the continued use of petroleum heating oil is inconsistent ... with ... a 45% reduction from the 1990 baseline in 2030.” (32) The Plan envisions “the statutory, regulatory, and financing mechanisms needed to ensure the development of reliable and affordable clean heat solutions for the Commonwealth’s buildings ... [including] Potential for sustainable and cost-effective market deployment of biofuels, renewable natural gas, and hydrogen for space heating. (33) See also the Department of Public Utilities future of gas docket, D.P.U. 20-80.

<sup>2</sup> This analysis does not include moderate-income homes and assumes no other energy efficiency measures, despite the significant opportunity to very cost-effectively retrofit inefficient low-income lighting, hot water systems, and appliances. The analysis also assumes no incremental federal funding will be available for the purpose and that no substitute for natural gas becomes available to obviate the need to convert natural gas heating to electric air source heat pumps.

For all these reasons, The Network recommends:

- \* Recognizing and planning to fund at needed scale, with no customer payment, the opportunity for proactive low- and moderate-income heat and weatherization retrofits,
- \* Continuing to provide funding for cost-effective efficient fossil heating system replacement for low- and moderate-income households in emergencies and when, as a practical matter, ASHPs cannot be installed, and
- \* Providing funding to support low- and moderate-income customers to cover all increased costs (e.g., for fuel and maintenance) due to electrification and other clean energy solutions.

### Transportation sector

At the core of the residential transportation energy policy is that “For the Commonwealth to achieve Net Zero, fossil fuel use must be all but completely eliminated in on-road vehicles by 2050. Given the cost and scarcity of low- or zero-carbon drop-in replacement fuels and the current market and growing availability of high efficiency battery-electric and other zero-emission vehicle (ZEV) alternatives, this likely means reaching near complete electrification of the light-duty fleet” and reducing vehicle-miles traveled. (at 17) The path to this end is based on the projection that, “Although EVs still have higher up-front purchase costs, trends in battery technology and vehicle markets have brought down these costs and increased vehicle charge range dramatically; continued improvements are likely to put EVs on the path to upfront cost parity by 2030. (18)

The Plan acknowledges that “EVs require the additional cost of installing electric vehicle supply equipment (EVSE) and Massachusetts residents who do not have access to overnight off-street parking in particular face challenges keeping their vehicles fully charged.” (19) However there is another major obstacle for low- and moderate-income households: even with current rebates (see at 22), a new EV at cost parity is not affordable for the vast numbers of households dependent on the used car market. We last checked Edmunds.com on August 11, 2020, which reported that the number of used EVs priced at or under \$15,000 within 200 miles of zip code 01610 (Worcester) is 0.6% of all locally listed cars for sale -- 253 in an area that covers an area beyond Massachusetts.

While there are many low-income transportation issues relevant to the Plan, including EV charging rate design (see filings in D.P.U 20-69), we focus in this Comment on one that can relate to the Building sector in which The Network operates: EV charging. The Plan notes funding of EV chargers at multi-unit dwellings by MassDEP (pursuant to a settlement with Volkswagen), Eversource, and National Grid (23).

The Network encourages more such funding, via or in coordination with MassSave, directed specifically to EV charging stations at low- and moderate-income dwellings.

## CONCLUSION

For all these reasons, The Network recommends:

- \* Recognizing and planning to fund at needed scale, with no customer payment, the opportunity for proactive low- and moderate-income heat and weatherization retrofits,
- \* Continuing to provide funding for cost-effective efficient fossil heating system replacement for low- and moderate-income households in emergencies and when, as a practical matter, ASHPs cannot be installed,
- \* Providing funding to support low- and moderate-income customers to cover all increased costs (e.g., for fuel and maintenance) due to electrification and other clean energy solutions. and
- \* Providing additional funding, via or in coordination with MassSave, directed specifically to EV charging stations at low- and moderate-income dwellings.

Respectfully submitted,

The Low-Income Energy Affordability Network, and  
Massachusetts Energy Directors Association (MEDA)

By their attorney,

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978-283-0897  
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Dated: March 22, 2021



Via email

March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy and Environmental Affairs  
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gwsa@mass.gov

Re: Mothers Out Front Massachusetts Comments on the Draft Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides:

Mothers Out Front Massachusetts submits these comments on the draft Clean Energy and Climate Plan for 2030 (“CECP”) related to **environmental justice for heat pump installations** and the **net zero stretch code** for your consideration as you finalize the Interim Plan. Mothers Out Front is a grassroots non-profit organization of mothers, grandmothers, and others inspired by the urgent need to act meaningfully on climate. In Massachusetts, we are 7,000 volunteers and supporters who advocate to protect our families and our communities from the serious negative impacts of greenhouse gas emissions (“GHG”) on their current and future health and well-being. Our interest in your work stems from our steadfast commitment to our ultimate goal: a healthy, sustainable planet, with a livable climate for all children and future generations. As mothers, we have a moral duty to our children and grandchildren to insist that the government, businesses, and individuals act in their interest by reducing these harmful emissions as swiftly as possible.

Mothers Out Front appreciates the thoughtful efforts by the Executive Office of Energy and Environmental Affairs to meet carbon reduction goals for 2030 while achieving environmental justice. We support the responses to the CECP report that are being submitted by the Gas Leaks Allies, as well as the Joint Comments on the 2030 Clean Energy and Climate Plan to Ensure Inclusion of Climate Justice and also the letter from Acadia Center to you. The comments submitted here urge the final plan to (1) make explicit a commitment to financially prioritize

mitigating the barriers to retrofitting housing in environmental justice communities,<sup>1</sup> including upgrading wiring, electrical service and insulation, and (2) ensure that the net zero stretch code becomes the base code well before 2028, that it is automatically adopted by existing Green Communities and required for new construction and substantial renovations.

### **The Heat Pump Conversion Challenge for Environmental Justice Communities**

The Interim Plan's goals include the installation of 1 million heat pumps<sup>2</sup> in residences and requires that its implementation be done with "a people-centered approach to reducing GHG emissions in ways that help close the health and economic disparities experienced in Environmental Justice communities." In addition, the Interim Plan (on p. 38) recognizes the need for both innovative utility business models to affordably deploy clean heating systems and deep energy retrofits, as well as zero up-front capital solutions for low income and affordable housing residents. More specifically, the Interim Plan acknowledges that "[s]ignificant funds must be devoted to deep energy retrofit programs, which will help to rightsize heat pumps and renewable systems to achieve optimal performance." **The final plan must financially prioritize retrofitting housing in environmental justice communities.**

In order for the plan to install 1 million heat pumps without a discriminatory impact on households in environmental justice communities, the CECP plan must make explicit that barriers to installation will be mitigated. Guaranteed financial support will be necessary to upgrade the wiring for the environmental justice community dwellings that have inadequate electrical service, since that is necessary before they are able to have heat pump technology.

Several hundred thousand dwellings in Massachusetts in environmental justice communities have antiquated knob and tube electrical wiring with 60-amp electrical service. Most of those homes are also uninsulated. Practically all are serviced with gas, some with oil and some may have electric heat or electric space heaters as well. Any cooling would be provided by window air conditioners. No home with a 60-amp wiring system can accommodate a heat pump system, whether it is part of a geothermal micro-district or is an air source or ground source heat pump for heating and cooling and a heat pump for hot water. These gas-free systems require at least a 100-amp, if not 200-amp electrical service. **The final plan must explicitly provide financial support for upgrading electrical service for dwellings in environmental justice communities.**

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<sup>1</sup> Mothers Out Front understands environmental justice communities to include underserved, low income, marginalized and frontline communities, as addressed by the IAC Climate Justice Working Group's guiding question of "How can this policy enhance environmental justice in the Commonwealth?" Interim Report, p. 15.

<sup>2</sup> Mothers Out Front regards the term "heat pumps" to include heat pump technology, and more specifically geothermal micro-districts that Eversource and National Grid are planning to install, as well as air source, ground loop and similar heat pump technologies that may be installed in individual buildings but not necessarily as part of a geothermal micro-grid.

It is likely that most of these environmental justice community dwelling units are rental units. Renters cannot take advantage of either MassSave rebates for insulation and system upgrades or no-interest loans because of their non-ownership status. Yet they still pay the fees and rates include funding for MassSave on their utility bills. The landlords of these environmental justice community dwellings have little incentive to upgrade electrical systems or to insulate if the energy cost of their buildings gets passed on to the renters. As wealthier homeowners convert from gas, the cost of the MassSave rebates and of no-interest loans provided to them will be included in the utility rates and borne by the remaining gas customers, who will include the low-income homeowners and the renters in environmental justice communities. **The final plan must provide incentives for landlords to upgrade electrical systems, insulate, and install heat pumps in their buildings.**

Conversion of the environmental justice community dwelling units would save substantial energy in the 3 million total units in the residential sector in Massachusetts. Uninsulated homes use up to three times as much energy to heat as insulated homes. They also use much more energy to cool than insulated homes. Therefore, 100,000 environmental justice community dwellings, which are inadequately wired and uninsulated, use as much energy to heat as 300,000 comparably-sized insulated and up-to-date wired homes. An added benefit is that conversion of those homes to heat pump technology would make their replaced gas consumption available to be used to generate electricity in the region, relieving demand spikes for gas at very cold times. **Conversion of environmental justice community dwellings would greatly boost the plan's ability to meet its goal to reduce energy usage and GHG emissions.**

### **The Passage of a New High-Performance Stretch Energy Code**

We applaud the commitment to a high-performance stretch energy code, focused on electrification and on deep efficiency at Passive House levels. Our understanding is that this new stretch code would replace the existing stretch code as of 2022. The Department of Energy Resources and the Bureau of Building Regulation and Standards should facilitate broad and swift adoption of the net zero stretch code. **The final plan should specify that current Green Communities will, without taking any action, be automatically opted in to the new stretch code, unless they choose to opt out.**

In addition, all new buildings and substantial renovations should be required to be fully electrified, with such exceptions as the agency deems appropriate by regulation, such as, if necessary, for laboratories and emergency generation. The Commonwealth cannot reasonably reach its GHG emissions objectives, not to mention its goals regarding numbers of heat pump installations, without this requirement. **The final plan must require all new buildings and substantial renovations be fully electrified before 2028.**

It is especially important that the net zero stretch code become the base code well prior to 2028, because of the new voting rules of the International Code Commission (ICC). As you know, Massachusetts by statute adopts the ICC energy code, with minor changes, as its base energy

code. The ICC has now changed its voting procedures in a way that virtually guarantees that future iterations of the code will be less progressive. **The final plan must set the base code to the net zero code before 2028 in order to meet its goal to reduce GHG emissions.**

Thank you for the opportunity to comment on the Interim Plan. We look forward to continuing to work with you and the Executive Office of Energy and Environmental Affairs in the implementation of this important Plan.

Sincerely,

Renu Bostwick and Mina Reddy, Co-Coordinator of the Leadership Team  
Mothers Out Front Massachusetts



Ms. Kathleen A. Theoharides  
 Secretary of Energy and Environmental Affairs  
 Massachusetts Executive Office of Energy and Environmental Affairs  
 100 Cambridge St, Suite 900  
 Boston, MA 02114

March 22, 2020

RE: Public Comment on the Interim Clean Energy and Climate Plan for 2030

The Combined Heat and Power Alliance (CHP Alliance) respectfully submits the following comments on behalf of 2G Energy Inc., AB Energy USA, Blue Delta Energy, Capstone Turbine Corporation, CEM Engineering, Curtis Power Solutions, Dalkia Aegis/ EDF Group, DT Energy Consultants, Durawatts LLC, Enginuity Power Systems, Integrated CHP Systems Corp., Kanin Energy, Kelly Generator & Equipment, Inc., Kinsley Energy Systems, Kraft Energy Systems, Martin Energy Group, Midwest Cogeneration Association, National Propane Gas Association, Northeast-Western Energy Systems, Northeast Clean Heat and Power Initiative, Sterling Energy Group LLC, Thermax USA, and Turbine Intel Cooling Association in response to the Executive Office of Energy and Environmental Affairs (EEA) open commenting period on the Massachusetts Interim Clean Energy and Climate Plan for 2030. Particularly, the CHP Alliance submits recommendations on the B2 Strategy Actions outlined in Chapter 3, Section 3.2: Transforming our Buildings, Getting to 45% in 2030.



The CHP Alliance is a diverse coalition and the leading national voice for the deployment of Combined Heat and Power (CHP). We are a coalition of business, labor, contractor, non-profit organizations, and educational institutions with the common purpose to educate all about CHP, and how CHP can make manufacturers and other businesses more competitive, reduce energy costs, enhance grid and customer reliability, and reduce emissions.

The B2 Strategy Actions states the *“DOER will work to phase out incentives for fossil fuel heating systems as soon as possible, limiting fossil fuel heating system incentives in the 2022-2024 Three Year Plan, and ending all fossil fuel heating system incentives by the end of 2024.”* The CHP Alliance strongly urges the EEA against phasing out said incentives, for it is proven that natural gas-fired CHP systems, eligible under the Mass Save® program incentives<sup>1</sup>, provide substantial emission reduction benefits.

CHP is a technology that when properly designed typically operates with an overall efficiency of 65-85 percent<sup>2</sup>, with some systems approaching 90 percent efficiency.<sup>3</sup> This efficient generation of energy reduces all types of emissions, including greenhouse gasses, criteria pollutants, and hazardous air pollutants.<sup>4</sup> In fact, a recent ICF report shows that CHP systems installed through 2035 and operating through 2050 are expected to cause a net reduction in carbon emissions over their system life.<sup>5</sup> Additional analysis conducted by the CHP Alliance denotes that through CHP and industrial efficiency measures, Massachusetts can reduce emissions nearly 3 million annual short tons of CO<sub>2</sub> emissions by 2030.<sup>6</sup>

CHP systems installed today running on fossil fuels can also be converted to use a variety of other decarbonized fuels in the near future, including biogas, biomethane or renewable natural gas, natural gas paired with Carbon Capture Utilization and Storage (CCUS), and hydrogen blended fuels.<sup>7</sup> Said conversions would add even greater carbon reductions to help Massachusetts meet its climate goals and could be implemented more broadly as decarbonized fuels become cost-effective.

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<sup>1</sup> Mass Save. “Combined Heat and Power (CHP).” <https://www.masssave.com/en/learn/business/combined-heat-and-power>

<sup>2</sup> U.S. Department of Energy. “Combined Heat and Power (CHP) Technical Potential in the United States.” March 2016, p. 3. [https://www.energy.gov/sites/prod/files/2016/04/f30/CHP\\_Technical\\_Potential\\_Study\\_3-31-2016\\_Final.pdf](https://www.energy.gov/sites/prod/files/2016/04/f30/CHP_Technical_Potential_Study_3-31-2016_Final.pdf)

<sup>3</sup> U.S. Environmental Protection Agency. Combined Heat and Power Partnership. “CHP Benefits.” <https://www.epa.gov/chp/chp-benefits>

<sup>4</sup> CHP Alliance. “CHP and a Changing Climate: Reducing Emissions and Improving Resilience.” January 2021. <https://chpalliance.org/resources/chp-and-a-changing-climate-reducing-emissions-and-improving-resilience/>

<sup>5</sup> ICF. “Combined Heat and Power Potential for Carbon Emission Reductions: National Assessment 2020-2050.” July 2020, p. 4. [http://consortia.myescenter.com/CHP/ESC\\_CHP\\_Emissions-Full\\_Study-ICF-071320.pdf](http://consortia.myescenter.com/CHP/ESC_CHP_Emissions-Full_Study-ICF-071320.pdf)

<sup>6</sup> CHP Alliance. “State Ranking of Potential Carbon Dioxide Emission Reductions through Industrial Energy Efficiency.” September 2016. [https://chpalliance.org/wp-content/uploads/2016/09/FINAL-AIE-State-Industrial-Efficiency-Ranking-Report\\_9\\_15\\_16.pdf](https://chpalliance.org/wp-content/uploads/2016/09/FINAL-AIE-State-Industrial-Efficiency-Ranking-Report_9_15_16.pdf)

<sup>7</sup> CHP Alliance. “CHP and a Changing Climate: Reducing Emissions and Improving Resilience.” January 2021. <https://chpalliance.org/resources/chp-and-a-changing-climate-reducing-emissions-and-improving-resilience/>

Another major benefit of keeping the incentives for CHP intact is the resiliency component, especially as the compounding effect of climate change is causing increased disruptions to the electricity grid.<sup>8</sup> CHP's ability to operate in island mode independent of the grid is an important metric in the preparation of climate-induced grid outages, which can be very costly as seen in the events that transpired in Texas in February. The resiliency and reliability of CHP systems are particularly vital for maintaining operations at critical infrastructure facilities—hospitals, universities, police and fire facilities, multi-family buildings, financial institutions, data operations—which are key components to not only the Massachusetts economy, but also provide essential services to the Commonwealth's residents during grid disruptions. Now is not the time to lessen incentives for a technology that is both clean and reliable.

The CHP Alliance strongly recommends that the EEA review the comments<sup>9</sup> submitted by Northeast Clean Heat and Power Initiative (NECHPI) to the Massachusetts Department of Energy Resources on December 4, 2020 in response to the Daymark Energy study conducted during the 2020 APS Minimum Standard Review. The study made claims that natural gas CHP does not reduce CO<sub>2</sub> emissions, and the NECHPI comments site numerous Massachusetts company testimonials as well as expert analysis to refute said claim and support the emission reduction benefits of CHP applications in the Commonwealth.

Lastly, the CHP Alliance urges the EEA to refer to our Smart Solutions to Reduce Greenhouse Gas Emissions Factsheet<sup>10</sup>, further outlining the significant opportunity to reduce emissions using CHP technologies and supporting the argument to maintain the fossil fuel incentives in Massachusetts under which CHP is categorized.

The CHP Alliance appreciates the opportunity to provide comments on the Massachusetts Interim Clean Energy and Climate Plan for 2030.

Respectfully,

2G Energy Inc.  
AB Energy USA  
American Gas Association  
Blue Delta Energy  
Capstone Turbine Corporation  
CEM Engineering  
Combined Heat and Power Alliance  
Curtis Power Solutions

Dalkia Aegis/ EDF Group  
DT Energy Consultants  
Durawatts LLC  
Enginuity Power Systems  
Integrated CHP Systems Corp.  
Kanin Energy  
Kelly Generator & Equipment, Inc.  
Kinsley Energy Systems

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<sup>8</sup> CHP Alliance. "CHP and a Changing Climate: Reducing Emissions and Improving Resilience." January 2021. <https://chpalliance.org/resources/chp-and-a-changing-climate-reducing-emissions-and-improving-resilience/>

<sup>9</sup> The NECHPI comments submitted to the DOER on December 4, 2020 are provided as an attachment in this set of CHP Alliance comments to the Executive Office of Energy and Environmental Affairs.

<sup>10</sup> CHP Alliance. "Alliance Factsheet on CHP and WHP as Smart Solutions to Reduce Emissions." February 2019. <https://chpalliance.org/resources/alliance-factsheet-on-chp-and-whp-as-smart-solutions-to-reduce-emissions/>

Kraft Energy Systems  
Martin Energy Group  
Midwest Cogeneration Association  
National Propane Gas Association  
Northeast-Western Energy Systems

Northeast Clean Heat and Power Initiative  
Sterling Energy Group LLC  
Thermax USA  
Turbine Intel Cooling Association



John Moynihan  
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PO Box 1000  
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Ms. Samantha Meserve  
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Massachusetts Department of Energy Resources  
100 Cambridge St #1020  
Boston, MA 02114

RE: 2020 APS Minimum Standard Review Comment

Dear Ms. Meserve,

The Northeast Clean Heat and Power Initiative (NECHPI) respectfully submits the following comments in response to the 2020 APS Minimum Standard Review. MA DOER has solicited comments to several stakeholder questions. To assist in the APS review, DOER hired an independent consultant, Daymark Energy, LLC, to undertake an assessment of the APS program.

DOER states that the primary areas of focus of the review include, but are not limited to:

- an examination of the costs and benefits of the program to ratepayers,
- an examination of the effectiveness of the program in meeting the energy and environmental goals of the Commonwealth, and
- an evaluation of whether the Minimum Standard or its rate of increase should be adjusted.

These comments address Stakeholder Questions with a particular focus on the three primary areas identified above by MA DOER. In addition, we comment upon several aspects of the Daymark Report that are relevant to understanding the benefits and costs of Combined Heat and Power (CHP) systems. We urge DOER to revisit some of the more controversial assumptions pertaining to CHP that are foundational to key conclusions reached about CHP in the Daymark assessment as well as to conduct a comprehensive analysis of the full suite of CHP (net) benefits as they compare to other APS eligible technologies and systems.

Appropriately designed CHP technologies and systems are tested, proven, reliable, and clean. The State of Massachusetts was a national innovator in the development of the Alternative Portfolio Standard that has rewarded high efficiency, environmentally superior energy technologies including CHP. The APS is a “smartly” designed incentive scheme insofar as higher

payments are made to the most efficient resources.

There are several assertions in the Daymark Alternative Portfolio Standard Review that are highly controversial. We urge that DOER revisit the empirical basis for the following claims:

- that there are no CO<sub>2</sub> savings from CHP,
- the capital costs of CHP systems assumed by the Daymark report,
- the Operations and Maintenance costs of CHP systems assumed in the report,
- the expected years to payback assumed in the report,
- the level of incentive that the CHP systems would receive from other (Non APS) programs, that assumed in the report, and to provide a more comprehensive picture, and
- list the full suite of environmental, societal, ratepayer, jobs and economic development benefits provided by CHP vis-à-vis other qualifying APS technologies.

The decision to prioritize resource technologies or continue CHP's full participation in the Alternative Portfolio Standard (APS) must be made on the basis of full and accurate information. The information provided by Daymark in the Alternative Portfolio Standard Review, with respect to CHP, is an insufficient basis for making decisions on CHP's role in the program. The report uses electric and natural gas emissions factors that are different from those used by the utilities and prescribed by the Massachusetts Department of Environmental Protection. The Daymark report uses a natural gas emissions factor that considerably overstates on-site combustion emissions, and an electric emissions factor that understates emissions from grid electricity. Both of these work to the detriment of CHP and do not describe its actual environmental benefit.

The Daymark report also assumes a total capital cost of CHP facilities that are not congruent with the experiences of sites that have invested in CHP. We urge that decisions on the continued economic support of CHP be made based on actual project data over the last 5 to 10 year period. This should include verified empirical information on initial capital costs and ongoing operations and maintenance (O&M) costs.

The incentive structure for CHP in the APS is particularly well designed and effective in promoting the public interest. Because it rewards systems more per kWh the higher their efficiency, it has driven installed systems to become more and more efficient. This has generated greater societal benefits through the reduction of CO<sub>2</sub> emissions and criteria pollutants, which is the goal of the APS. Any revision to the AEC market of APS eligibility should accurately account for the prior and ongoing achievements of program participants. We will address our concerns with how the Daymark report does this in answering the following questions posed by the Massachusetts DOER.

**1. What are the benefits of the APS program to ratepayers, including but not limited to economic, environmental, and societal benefits?**

CHP systems participating in the APS program provide a suite of benefits to ratepayers. They reduce the emission of CO<sub>2</sub> and other criteria pollutants, as well as providing on-site electric and thermal resiliency. To enter into the record empirical information. We suggest as one resource examining the benefits that are quantified for CHP projects that have received the Mass Save incentive. Several of the CHP benefits are measured and verifiable. The DOER could include the suite of CHP benefits that are identified by projects obtaining the Mass Saves incentive. In addition, we urge that DOER utilize program information on CO<sub>2</sub> reductions from CHP from Mass Saves funded projects. Another, albeit anecdotal, data resource are the several US EPA CHP Award winning projects based in Massachusetts that have self-certified significant CO<sub>2</sub> reductions as well as dozens of Massachusetts businesses that have made public statements on the CO<sub>2</sub> reductions from their CHP investments.

We feel that the conclusion that CHP has no CO<sub>2</sub> emission benefit has been reached in error. It's our understanding that the Daymark report used the 2017 NE ISO All LMU Time-Weighted emissions rate of 654 lbs CO<sub>2</sub>/kWh for their assumption of offset grid emissions. The Time-Weighted marginal emission rate assumes that when there are multiple marginal resources within a time interval, they split the load equally. However, when more than one resource is marginal, the system is typically constrained and marginal resources likely do not contribute equally to meeting load across the system. The NE-ISO added a new method for calculating marginal emission rates for 2018, which incorporates the percentage of system load a marginal unit can serve. This method, referred to as the Load-Weighted LMU approach, is based on the assumptions used by the ISO New England Internal Market Monitor (IMM) to report the percentage of the total system load that can be served by marginal units of a particular fuel or unit type. The 2018 Load-Weighted emissions rate is 745 lbs CO<sub>2</sub>/kWh.

Further, the EPA and Massachusetts DEP recommend using the eGRID Non-Baseload emissions rate for the NE ISO, which is used to calculate CO<sub>2</sub> savings from Mass Save projects. The eGRID 2018 Non-Baseload emissions rate for the New England subregion is 931 lbs CO<sub>2</sub>/MWh. Using either 745 lbs/kWh or 931 lbs/kWh has a drastic effect on the potential CO<sub>2</sub> savings of CHP systems, certainly making them non-zero.

On counting CHP emissions, Daymark utilized a lifecycle emissions rate for natural gas CHP of 158.1 lbs CO<sub>2</sub>/MMBtu. However, none of the NE ISO or eGRID emissions estimates discussed above include lifecycle emissions, only combustion emissions. A comparable emissions rate for CHP would be 116.9 lbs CO<sub>2</sub>/MMBtu. Combined with the corrected grid emissions rates, CHP can provide substantial CO<sub>2</sub> savings.

CHP systems also provide savings in the wholesale energy and capacity markets, and by decreasing energy imported from outside Massachusetts, keeping dollars in the state economy. CHP systems can reduce transmission and distribution costs, both for reduced capital expenditure in congested areas and in reduced O&M costs, benefiting ratepayers and increasing



grid reliability. Investing in CHP also provides direct and secondary economic benefits to the state economy through industry design and construction jobs, as well as service jobs.

We suggest that the FULL picture of the benefits of CHP, in the APS program, vis-à-vis all other qualifying technologies out to recognize (in addition to CO<sub>2</sub> reductions) these important ratepayer and societal benefits

The CHP component of the APS program provides a suite of benefits to ratepayers that include the following:

- Reduction in criteria pollutants,
- Reduction in CO<sub>2</sub> (greenhouse gas) emissions,
- Power and Thermal Energy **resiliency** for appropriately designed CHP systems,
- Economic multiplier benefits (importing less energy) keeping dollars in MA economy,
- Local job creation, direct industry jobs, service jobs,
- Critical infrastructure support including health-care, hospitals, research, pharmaceuticals, key supply chain products and services,
- Energy and capacity savings,
- Reduction in utility transmission and distribution (T&D) capital costs benefiting ratepayers,
- Reduction in utility T&D operating and maintenance costs benefiting ratepayers, and
- Reduction in local T&D congestion, enhancing the network reliability.

**2. What are the costs of the APS program to ratepayers, including but not limited to economic, environmental, and societal costs?**

The costs of the APS program to ratepayers are the increased cost of electricity that accrue as a consequence of the Alternative Portfolio Standard (APS) obligation. This is true for electric (or natural gas) utility programs that provide incentives to accelerate the market penetration of renewable energy, clean energy or energy efficiency technologies and systems. A fair accounting of the costs of the APS program must take into account the offsetting APS program benefits described in the answer to Question 1 above.

**3. Do you believe the APS program should prioritize technologies which provide the most benefits, such as greatest greenhouse gas emissions reductions?**

The APS should prioritize technologies that provide the most cost-effective benefits, that is, quantified benefits delivered on a dollar-per-benefit basis. Further, the APS program should *comprehensively* assess the entire suite of benefits provided by the different technologies that are eligible for the APS. Not all eligible technologies deliver the same set of benefits. The APS program might prioritize greenhouse gas reductions but should not ignore, for example, resiliency benefits, or avoided T&D capital costs, or reductions in local grid congestion

The APS program already prioritizes CHP projects based on their total efficiency, and therefore by their greenhouse gas emissions reductions. This is shown in the table below.

**Depends on the sale price per AEC and the HHV net electrical and thermal efficiency of the system – this example based on a gross value of \$19 per AEC.**

EFFICIENCY			c/kWh
Electric	Thermal	Overall	
0.25	0.35	0.6	1.48
0.3	0.3	0.6	1.8
0.25	0.4	0.65	1.85
0.3	0.35	0.65	2.08
0.3	0.4	0.7	2.45
0.25	0.45	0.7	2.3
0.35	0.4	0.75	2.83
0.25	0.5	0.75	2.75
0.3	0.5	0.8	3.38

Source: *The Massachusetts APS Incentive for CHP, Massachusetts DOER 2016*



<i>Qualified Technologies</i>		<i>Avoided CO<sub>2</sub></i>	<i>Avoided T&amp;D Capital Expense</i>	<i>Avoided T&amp;D O&amp;M Expense</i>	<i>Resiliency Benefit</i>	<i>Other Benefits</i>
<i>CHP, Fuel Cells, and WTE</i>	<i>Natural Gas CHP</i>					
	<i>Digester Gas CHP</i>					
	<i>Natural Gas Fuel Cell</i>					
<i>Thermal Technologies</i>	<i>Solar Thermal – Small</i>					
	<i>Solar Thermal - Intermediate</i>					
	<i>ASHP - Small</i>					
	<i>ASHP – Intermediate</i>					
	<i>GSHP - Small</i>					
	<i>GSHP - Intermediate</i>					
	<i>Biofuels Aggregations</i>					

While the State might determine that the greatest greenhouse reductions should be prioritized it would be imprudent to ignore important ratepayer and societal benefits that are provided by CHP and, not necessarily provided at the same level or at the same cost, as other qualifying APS technologies.

We suggest consideration of a table of benefits, **illustrated by the table below** addressing the level of and the delivered cost of a suite of ratepayer and societal benefits provided by the following APS qualifying technologies.

- a. The unit cost to ratepayers and society generally per unit of greenhouse gas emissions reductions, and
- b. Additional ratepayer and societal benefits that are provided in a widely varying range unit costs

<i>Qualified Technologies</i>		<i>Avoided CO<sub>2</sub></i>	<i>Avoided T&amp;D Capital Expense</i>	<i>Avoided T&amp;D O&amp;M Expense</i>	<i>Resiliency Benefit</i>	<i>Other Benefits</i>
<i>CHP, Fuel Cells, and WTE</i>						
<i>Natural Gas CHP</i>						
<i>Digestor Gas CHP</i>						
<i>Natural Gas Fuel Cell</i>						
<i>Thermal Technologies</i>						
<i>Solar Thermal – Small</i>						
<i>Solar Thermal - Intermediate</i>						
<i>ASHP - Small</i>						
<i>ASHP – Intermediate</i>						
<i>GSHP - Small</i>						
<i>GSHP - Intermediate</i>						
<i>Biofuels Aggregations</i>						

**5. Is the current APS minimum standard and the annual rate of increase adequate? Please include details and any data supporting why or why not, where possible.**

Given the recent collapse in the price of Alternative Energy Credits (AECs) it's apparent that there is an egregious imbalance between the supply of, and the demand for, AECs. On the supply side, there has been a significant increase in technologies eligible to supply the market. On the demand side, there has been no countervailing reaction to the rapid increase in supply.

This has created a drop in prices from the \$20 - \$22/MWH range to ~ \$5/MWH. The volatility considerably blunts the market incentive impacts of the APS program. It's imperative that this be corrected.

**6. Do you anticipate a growth or decline in the supply of AECs in the APS program over the next 5 years? 10 years? If so, how would you quantify this increase in growth rate? Please include details and any data supporting your conclusions.**

We expect a growth in the supply of AEC's in the APS program over the next 5 years and 10 years. We urge that MA DOER revisit the assumptions made in the Daymark report on the expected annual rate of growth in AECs supplied by CHP systems. The projection of CHP supply in the Daymark report is significantly biased by the addition of two extraordinarily large projects (Kendall Square 216 MWs and MATEP 68 MWs). Removing these two systems, that together account for nearly 70% of the MW's of that installed CHP capacity eligible for the MA APS program presents a more accurate picture of what future CHP additions are likely to be over the next 5 to 10 years. With these two projects removed and based on the history of project additions, the projected CHP annual installed capacity additions is likely to be in the 10-15 MW range per year.

**7. Are there modifications to the APS program that could be made to reduce the volatility of the APS market?**

Yes, there are several potential modifications to the APS program that could be made to reduce the volatility of AEC prices, and reducing volatility ought to be a primary objective of this proceeding. Volatility in the APS market significantly blunts the incentive benefit of the program, and the efficacy of the APS as a tool for accelerating renewable and clean energy investments is hampered by market volatility.

In the short term, we suggest that the APS adopt a price floor. This would put a lower bound on the projections that investors and financiers utilize when considering a qualified APS investment.

We then urge the Massachusetts DOER to adopt a market correction mechanism that would adjust the market demand to the market supply by scaling the obligated purchase requirement of AECs to their availability. As all technologies continue to proliferate in the AEC market a market correction mechanism, rather than an arbitrary "set and forget" annual percentage increment that takes effect irrespective of market demand and supply conditions, will ensure greater market stability.

**8. Has the APS incentive had an impact on the decision of system owners to invest in APS eligible technologies? Why or why not.**

Yes, the APS incentive is important for end user sites interested in investing in CHP. At one time, with the AEC's returning approximately \$20/MWH, this additional revenue stream helped end-user sites at hospitals, nursing homes, large multifamily complexes and manufacturing sites to invest with the confidence that a significant amount of the O&M costs of CHP would be covered by the AECs.

As noted above, properly designed and configured CHP systems can offer a significant resiliency



benefit that's not provided by most other qualifying APS resources. According to the U.S. Department of Energy's Combined Heat and Power Installation Database { Source: { source [U.S. Department of Energy Combined Heat and Power Installation Database | Facilities in MA \(icfwebsiteservices.com\)](https://www.icfwebsiteservices.com) } there are CHP facilities serving critical infrastructure including

Nursing Homes	SIC 8051
Hospitals	SIC 8062
Wastewater Treatment	SIC 4952
Correctional Facilities	SIC 9223
Colleges/Universities	SIC 8221

The investments at facilities of this type, providing critical services that are clearly in the public interest, are supported by the additional revenue streams from the APS program. We urge MA DOER to consider this resiliency benefit as well as those identified in the table on page 6, as you evaluate the continuing role of CHP in the APS program.

**12. Is there any additional information you believe DOER should consider in its 2020 APS Minimum Standard Review?**

Please see the attached list of CHP site testimonials that have brought proven benefits to the State of Massachusetts and value the support the State has given them in their installation and operation of CHP.

Sincerely yours,

*John Moynihan*

John Moynihan  
Chair, NECHPI Board of Director

## Appendix 1 – Company Testimonials

Please find the following supporting demonstrations and testimonials of CHP systems operating in Massachusetts.

### EPA Energy Star CHP Award

#### University of Massachusetts Medical School, Worcester Campus — Worcester, Massachusetts



Recognizing the importance of highly efficient and resilient energy production, the UMass Medical School (UMMS) relies on CHP to help power its Worcester, Massachusetts campus, which hosts over 7,300 employees and 2,900 visitors daily. This Energy Star CHP Award recognizes UMMS's third and most recent CHP expansion: the addition of a 7.5 MW natural gas-fired [Solar Turbines](#) combustion turbine generator, with the assistance of [Waldron Engineering & Construction](#).

With an efficiency of 73 percent, the new CHP unit requires approximately 20 percent less fuel than conventional separate electricity and steam production. The reduced fuel use **avoids emissions of more than 21,000 tons of carbon dioxide annually**, equal to the emissions from the generation of electricity used by more than 2,800 homes. Moreover, by generating electricity on site, the system strengthens the regional transmission and distribution infrastructure.

The expanded power plant generates up to 90% of the campus's electricity needs. Because the plant's electrical output is responsible for less carbon pollution than grid-supplied electricity, the facility receives substantial payments through Massachusetts' Alternative Portfolio Standard program with the assistance of their representative, [Green Harbor Energy](#). The plant reduces the facility's cost of energy services by approximately \$3 million annually. |

## Medical Area Total Energy Plant (MATEP) LP



This award recognizes the Medical Area Total Energy Plant (MATEP) LP for the superior efficiency of its 46 MW CHP system that produces steam, chilled water, and electricity for the Longwood Medical and Academic Area (LMA).

A key driver for the development of the CHP system was to increase energy reliability by decreasing dependence on the local utility—particularly important because of the critically important missions of the medical facilities it serves. The MATEP system is designed to operate and remain fully functioning during a power outage, thus ensuring that critical operations at the hospitals and research centers served by MATEP can continue without interruption in the event of disruption to the local power grid. Located in Boston,

Massachusetts, the LMA is home to five hospitals as well as numerous biomedical and pharmaceutical research centers and Harvard Medical School-affiliated teaching institutions. The LMA includes more than 1,800 patient beds and serves 103,000 inpatients and more than 2.4 million outpatients per year.

Two natural gas-fired combustion turbines equipped with heat recovery steam generators power the CHP system, producing up to 360,000 pounds of steam per hour and 24 MW of electricity. The steam is used in steam turbines to generate an additional 22 MW of electricity and also to heat water for space heating and other uses. In addition, several chillers use part of the steam output to produce chilled water for space cooling.

With an operating efficiency of 75 percent, the CHP system requires approximately 24 percent less fuel than supplying electricity from the grid and producing steam with a boiler. **The system also prevents emissions of air pollutants, including an estimated 117,500 tons of CO<sub>2</sub> emissions annually**, equal to that from the generation of electricity used by more than 13,000 homes.

MATEP is owned by Morgan Stanley Infrastructure Partners and Veolia Energy North America, a partner in EPA's CHP Partnership.

## University of Massachusetts Amherst

In December 2008, the University of Massachusetts Amherst began operation of a 14 MW CHP system. The system represents a major milestone for the university and is part of a multi-year initiative to reduce fuel consumption and minimize its environmental footprint. Activities ranging from the replacement of old light fixtures to the \$133 million investment in the CHP system are the reason the university has reduced overall energy consumption by 21 percent since 2004.

A 10 MW Solar combustion turbine, a heat recovery steam generator, a 4 MW steam turbine and three natural gas-fired boilers replace the university's nearly 80 year-old coal-fired boilers. The CHP system produces nearly all of the electric and steam demand for a campus comprising over 200 buildings and nearly 10 million gross square feet of building space. Interestingly, a unique and environmentally progressive characteristic of the system has little to do with energy conservation; 160,000 gallons of treated effluent per day from the local wastewater treatment plant is used to generate steam. The effluent replaces the drinking water that would typically be used by such systems.

With an operating efficiency of nearly 75 percent, the CHP system requires approximately 18 percent less fuel than the separate production of thermal energy and electricity. Based on this comparison, **the CHP system prevents an estimated 26,600 tons per year of CO<sub>2</sub> emissions**, equivalent to the emissions from more than 4,600 passenger vehicles.

EPA is proud to recognize the outstanding pollution reduction and energy efficiency qualities of this project with a 2011 ENERGY STAR® CHP Award. |

**Bridgewater Correctional Complex Cogeneration Plant  
(Awarded ENERGY STAR CHP Award October 1, 2009, at 2009 CHP Partners Meeting)**

The Bridgewater Correctional complex consists of 785,000 square feet of living and working space on 14,900 acres. In 2006, the Commonwealth of Massachusetts Department of Correction began operating a 1,500 kW CHP system to support those facilities and an inmate population of over 2000 people.

The CHP system utilizes a Kawasaki natural gas-fired combustion turbine to generate nearly 80 percent of the complex's annual electricity demand. Equipped with Kawasaki XONON combustors, the NO<sub>x</sub> emissions from the turbine are low enough to meet NO<sub>x</sub> emission requirements without the need for add-on pollution controls.

Otherwise wasted heat is recovered from the turbine exhaust and used to produce steam to support the daily heating, cooking, cleaning, and domestic hot water needs of the complex. Operation of the CHP system also allowed the Department of Correction to shut down an old and more-polluting diesel engine generator.

With an operating efficiency of approximately 67 percent, the CHP system requires approximately 17 percent less fuel than typical onsite thermal generation and purchased electricity. Based on this comparison, **the CHP system effectively reduces CO<sub>2</sub> emissions by an estimated 3,600 tons per year.** [This reduction is equivalent to the annual emissions from 600 passenger vehicles.

EPA is proud to recognize the outstanding pollution reduction and energy efficiency qualities of this project by presenting the **Commonwealth of Massachusetts Department of Correction** with a 2009 ENERGY STAR CHP Award.

**Massachusetts Institute of Technology**

- College campus and research Facility 44 MW Gas Turbines
- “The CUP’s efficiency and environmental gains will result from the installation of new and upgraded equipment as well as the switch to natural gas and the elimination of fuel oil use (except for emergencies). State-of-the-art emissions controls will contribute to the improvements. Starting in 2020, regulated pollutant emissions are expected to be more than 25 percent lower than 2014 emissions levels, and greenhouse gas emissions will be 10 percent lower than 2014 levels, offsetting a projected 10 percent increase in greenhouse gas emissions due to energy demands created by new buildings and program growth.”

**Erving Industries, INC. (Erving Massachusetts)**

- Pulp and Paper 6.36 MW Gas turbine
- “The CHP system is responsible for reducing carbon dioxide (CO<sub>2</sub>) emissions by 21.6 million lb/yr and reducing grid-purchased electricity by 39 million kWh/yr.”

**Boston Scientific Marlborough Campus (Marlborough Massachusetts)**

- Research Facility 555 kW
- ”Boston Scientific evaluated the site and determined CHP was a good option because it would both save money and reduce the company’s carbon footprint.”



**Cape Codder-Resort & Spa (Cape Cod, Massachusetts)**

- Hotel 525 kW
- “The Cape Codder Resort & Spa has taken a measurable step towards a more positive impact on the environment, citing a 70% reduction in their carbon footprint after installing CHP.”

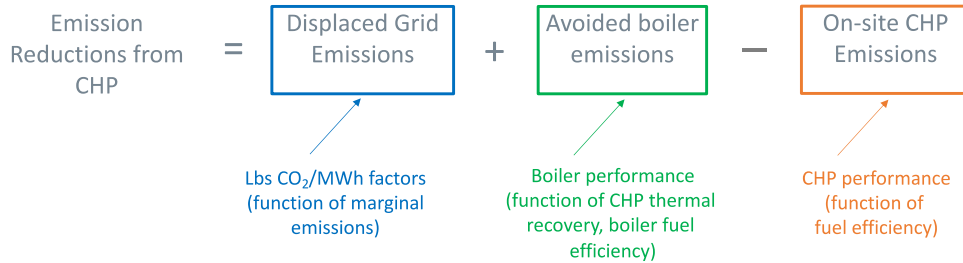
**Seaman Paper (Otter River, Massachusetts)**

- Pulp and paper 283 kW
- “30% NOx reduction and 95% SO2 reduction”



## Appendix 2 – Comparative CO<sub>2</sub> Emissions of CHP and NE ISO

### Calculating CHP CO<sub>2</sub> Emissions Impacts



$$\text{Effective Electric Emissions}_{\text{CHP}} = (\text{CHP CO}_2 \text{ emissions (lbs/hr)} - \text{Displaced Boiler CHP Emissions (lbs/hr)}) / \text{MW}_{\text{CHP}}$$

Natural Gas Combined Cycle:	770 - 850 lbs CO <sub>2</sub> /MWh	
Recip Engine CHP:	430 - 550 lbs CO <sub>2</sub> /MWh	(100% thermal utilization)
Gas Turbine CHP:	550 - 650 lbs CO <sub>2</sub> /MWh	(100% thermal utilization)

December 3, 2020

Source: Entropy Research, LLC. Bruce Hedman December 1, 2020 Bruce Hedman  
[bhedman.entropyresearch@gmail.com](mailto:bhedman.entropyresearch@gmail.com)

### Daymark APS study concluded natural gas CHP does not reduce CO<sub>2</sub>

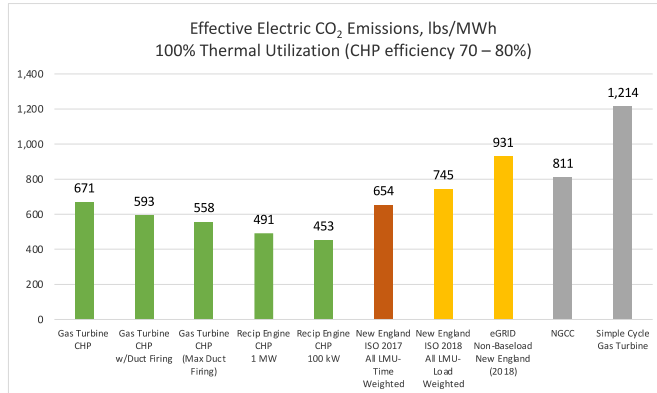
- The study used an incorrect emissions rate assumption for natural gas CHP
  - Natural gas Life Cycle emissions rate assumption - 158.1 lbs CO<sub>2</sub>/MMBtu
  - NE ISO All Locational Marginal Unit\* time-weighted emissions rate assumption – 654 lbs CO<sub>2</sub>/MWh (this is not a Life Cycle emissions rate – stack emissions only)
  - An apples to apples comparison should be based on natural gas combustion emissions rate (not life cycle) – 116.9 lbs CO<sub>2</sub>/MMBtu
- The study used an outdated approach to estimating marginal emissions for ISO New England
  - Study was based on 2017 NE ISO All LMU **Time-Weighted** emissions rate of 654 lbs CO<sub>2</sub>/kWh
  - The **Time-Weighted** method for calculating the marginal emission rate is based on the assumption that **when there are multiple marginal resources within a time interval, they split the load equally**. However, when more than one resource is marginal, the system is typically constrained and marginal resources likely do not contribute equally to meeting load across the system. At the request of regional stakeholders and the Environmental Advisory Group, the ISO added a new method for calculating marginal emission rates for 2018, which is **based on the percentage of system load a marginal unit can serve**. This method, referred to as the **Load-Weighted** LMU approach, is based on the assumptions used by the ISO New England Internal Market Monitor (IMM) to report the percentage of the total system load that can be served by marginal units of a particular fuel or unit type. The 2018 Load-Weighted emissions rate is **745 lbs/kWh**
- Quantifying displaced grid emissions from CHP should also reflect T&D losses (1 kWh of CHP generation displaces 1/(1-T&D%) kWh of grid power)
  - EPA's eGRID 2020 (2018 data) lists 4.88% as the average annual T&D losses in the Eastern Interconnect
- EPA recommends using either eGRID Non-Baseload emissions or AVERT Uniform Emissions factors for estimating displaced central station generation emissions reductions resulting from energy efficiency/CHP programs or projects (*Incorporating Energy Efficiency and Renewable Energy into State and Tribal Implementation Plans\**)
  - eGRID 2018 Non-Baseload emissions rate for the New England subregion – 931 lbs CO<sub>2</sub>/MWh
  - AVERT 2018 Uniform Efficiency emissions rate for New England region – 1,104 lbs CO<sub>2</sub>/MWh (the AVERT factor includes T&D losses)
  - \*[https://www.epa.gov/sites/production/files/2016-05/documents/appendixi\\_0.pdf](https://www.epa.gov/sites/production/files/2016-05/documents/appendixi_0.pdf)

December 3, 2020

Source: Entropy Research, LLC. Bruce Hedman December 1, 2020 Bruce Hedman  
[bhedman.entropyresearch@gmail.com](mailto:bhedman.entropyresearch@gmail.com)

## CHP Continues to Reduce CO<sub>2</sub> Emissions in New England

- Natural gas CHP provides CO<sub>2</sub> emissions reductions when the effective electric CO<sub>2</sub> emissions from CHP (lbs/MWh) is lower than the marginal emissions from displaced grid electricity\*
- Natural gas CHP has lower effective electric CO<sub>2</sub> emissions (lbs CO<sub>2</sub>/MWh) than both the ISO New England 2018 All LMU Load Weighted and eGRID New England 2018 Non-Baseload emissions factors (two approaches to estimating the marginal emissions from displaced grid power)
- CHP's high effective electric efficiency and high operational capacity factors leads to significant CO<sub>2</sub> emissions reductions on an annual basis
- CHP is the most efficient method of generating electricity with natural gas; CHP's efficiency and resilience advantages will remain as the natural gas infrastructure decarbonizes
- RNG/hydrogen fueled CHP can decarbonize facilities that need dispatchable on-site generation for resilience, and industrial processes that will be difficult to electrify



Effective CO<sub>2</sub> emissions based on CHP performance from DOE Technology Fact Sheets (2017) and EPA eGRID 2020 (2018 data) national average T&D losses of 4.88% (T&D loss credit applied to CHP output); Assumes CHP thermal displaces an 80% efficient on-site natural gas boiler

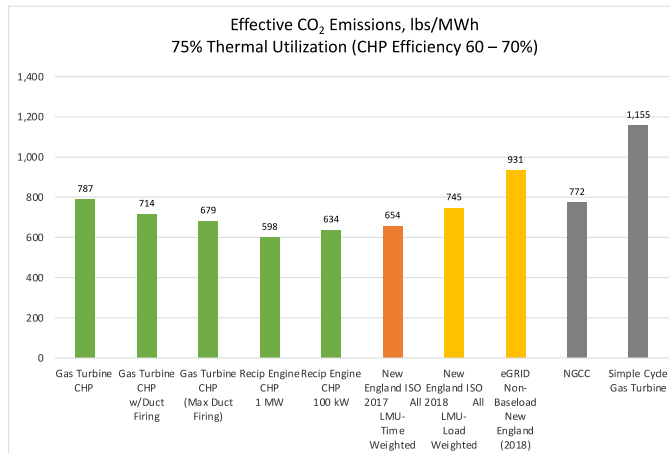
\*Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems, U.S. Environmental Protection Agency Combined Heat and Power Partnership, February 2015

December 3, 2020

Source: Entropy Research, LLC. Bruce Hedman December 1, 2020 Bruce Hedman [bhedman.entropyresearch@gmail.com](mailto:bhedman.entropyresearch@gmail.com)

## CHP Effective CO<sub>2</sub> Emissions – 75% Thermal Utilization

- 7.5 MW Gas Turbine CHP efficiency: 60% (unfired)
- 1 MW Recip Engine CHP efficiency: 70%
- 100 kW Recip Engine CHP efficiency: 70%
- MASS Save minimum CHP efficiency: 60%



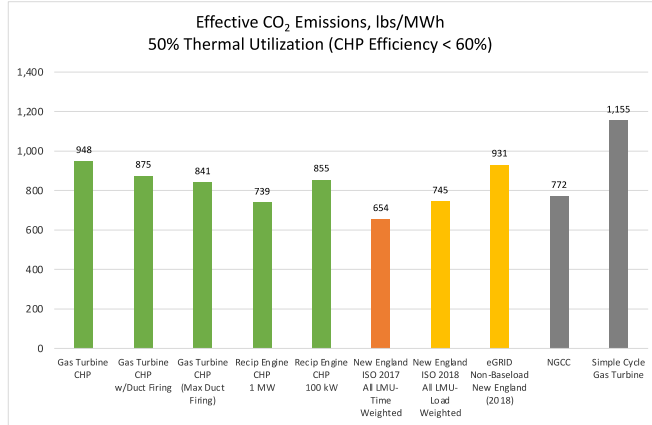
Effective CO<sub>2</sub> emissions based on CHP performance from DOE Technology Fact Sheets (2017) and EPA eGRID 2020 (2018 data) national average T&D losses of 4.88% (T&D loss credit applied to CHP output); Assumes CHP thermal displaces an 80% efficient on-site natural gas boiler

December 3, 2020

Source: Entropy Research, LLC. Bruce Hedman December 1, 2020 Bruce Hedman [bhedman.entropyresearch@gmail.com](mailto:bhedman.entropyresearch@gmail.com)

## CHP Effective CO<sub>2</sub> Emissions – 50% Thermal Utilization

- 7.5 MW Gas Turbine CHP efficiency: 50% (unfired)
- 1 MW Recip Engine CHP efficiency: 59%
- 100 kW Recip Engine CHP efficiency: 56%
- MASS Save minimum CHP efficiency: 60%

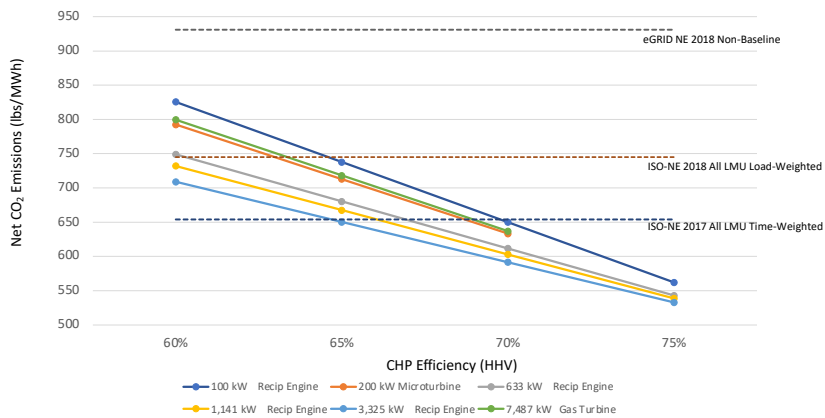


Effective CO<sub>2</sub> emissions based on CHP performance from DOE Technology Fact Sheets (2017) and EPA eGRID 2020 (2018 data) national average T&D losses of 4.88% (CHP loss credit applied to CHP output); Assumes CHP thermal displaces an 80% efficient on-site natural gas boiler

December 3, 2020

Source: Entropy Research, LLC. Bruce Hedman December 1, 2020 Bruce Hedman [bhedman.entropyresearch@gmail.com](mailto:bhedman.entropyresearch@gmail.com)

## CHP Net Effective CO<sub>2</sub> Emissions vs CHP Efficiency



Effective CO<sub>2</sub> emissions based on CHP performance from DOE Technology Fact Sheets (2017) and EPA eGRID 2020 (2018 data) national average T&D losses of 4.88%; Assumes CHP thermal displaces an 80% efficient on-site natural gas boiler

Source: Entropy Research, LLC. Bruce Hedman December 1, 2020 Bruce Hedman [bhedman.entropyresearch@gmail.com](mailto:bhedman.entropyresearch@gmail.com)

### CHP Net Effective CO<sub>2</sub> Emissions vs CHP Efficiency

*Effective CO<sub>2</sub> Emissions Rate (lbs/MWh)*

		100 kW Recip Engine	200 kW Microturbine	633 kW Recip Engine	1,141 kW Recip Engine	3,325 kW Recip Engine	7,487 kW Gas Turbine	ISO-NE LMU 2017 Time- Weighted	ISO-NE LMU 2018 Load- Weighted	eGRID NE 2018 Non- Baseload
CHP Electric Output, kW		100	200	633	1,141	3,325	7,487			
Electric Efficiency (HHV), %		27.0%	29.8%	34.5%	36.8%	40.4%	29.2%			
Thermal Output, MMBtu/hr		0.67	0.90	2.78	4.32	10.67	36.3			
Net Overall Efficiency (HHV), %	60%	826	793	749	732	709	800	654	745	931
	65%	738	713	680	668	650	718	654	745	931
	70%	650	633	612	603	592	637	654	745	931
	75%	562		543	539	533		654	745	931
	80%	474		474	474	474		654	745	931

Effective CO<sub>2</sub> emissions based on CHP performance from DOE Technology Fact Sheets (2017) and EPA eGRID 2020 (2018 data) Eastern Interconnect average T&D losses of 4.88%; Assumes CHP thermal displaces an 80% efficient on-site natural gas boiler

*Source: Entropy Research, LLC. Bruce Hedman December 1, 2020 Bruce Hedman  
[bhedman.entropyresearch@gmail.com](mailto:bhedman.entropyresearch@gmail.com)*



March 22, 2021

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Secretary Kathleen A. Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Dear Secretary Theoharides:

On behalf of our 130 member businesses and institutions, thank you for your vision and leadership in developing both the 2050 Decarbonization Roadmap and the Interim Clean Energy and Climate Plan for 2030 (CECP). A Better City appreciates the Baker Administration's commitment to identifying cost-effective and equitable strategies to ensure that Massachusetts reduces greenhouse gas emissions by at least 85% by 2050 and achieves net-zero emissions.

A Better City is honored to sit on the Global Warming Solutions Act Implementation Advisory Committee (IAC) and to serve on both the Transportation Working Group and Buildings Sector Working Group. The enclosed comments are informed by A Better City's participation on the IAC and ongoing collaboration with the business community. A Better City is grateful for the opportunity to review the interim CECP and respectfully submits the enclosed comments, which focus primarily on the CECP transportation and buildings sector strategies.

Overall, the CECP transportation sector strategies fail to prioritize investment in public transit, instead focusing almost exclusively on the promotion of zero emission vehicles (ZEVs). This short-sighted, one-dimensional focus on ZEVs contradicts Governor Baker's own Commission on the Future of Transportation report, which stated that "high-frequency, high-capacity public transit is the most efficient and sustainable way to move large numbers of people as they go about their daily lives. This is true today and will be true in 2040." The current CECP transportation approach does not adequately encourage near-term vehicle miles traveled (VMT) reduction to reduce crippling roadway congestion and represents a missed opportunity to maximize co-benefits that will create a more vibrant, equitable, and connected Commonwealth for all.

Similarly, the narrowly-focused CECP buildings sector strategies emphasize the electrification of thermal heating systems, neglecting to adequately acknowledge or address the major hurdles that must be overcome in order to electrify systems in commercial, industrial, and institutional building stock. These hurdles include enormous technical and financial constraints associated with implementing so-called deep energy retrofits, as well as access to a qualified workforce and access to clean, reliable, affordable electricity. As explored further in A Better City's June 2020 report, "[Thermal Electrification of Large Buildings in the Commonwealth](#)," a variety of policies and strategies will be required to address the market barriers to thermal electrification technologies.

In summary, A Better City offers the following recommendations to strengthen the CECP:

- **Transportation Sector:** A Better City urges EEA to revise the CECP to include a new standalone strategy to modernize, expand, and improve public transit throughout the Commonwealth and to decarbonize train and bus fleets, including the MBTA's commuter rail and bus systems. Beyond prioritizing investment in public transit, the CECP should advance smart roadway pricing strategies; set more aggressive, annual VMT reduction targets for all passenger vehicle trips, not just for commutes; prioritize the electrification of commercial fleets, including delivery vehicles; incentivize the development of flexibly-designed commercial EV charging infrastructure, as well as the purchase of e-bikes; support Transportation Management Association (TMA)-led transportation demand management (TDM) strategies as well as the development of active transportation infrastructure; and ensure the affordability of clean, reliable power via the grid.
- **Buildings Sector:** A Better City recommends adding a suite of new stand-alone strategies to address the following overlooked priorities: deep energy building retrofits; workforce development; grid and building electric capacity; clean, reliable, and affordable electricity; and statewide financing strategies. Additionally, A Better City recommends targeted changes to the proposed stretch energy code development and implementation process; additional analysis to assess the impact of phasing out combined heat and power (CHP) incentives in the commercial, industrial, and institutional sectors; the addition of an A Better City representative on the Clean Heat Commission; and further study of low-and zero-carbon fuels to understand how they could support commercial building decarbonization.
- **Other:** A Better City suggests establishing a new strategy within the natural and working lands chapter to develop offsetting best practices to inform the proposed market-based accounting frameworks for carbon sequestration. Moreover, A Better City recommends expanding the composition of the Carbon Sequestration Task Force to include a representative from A Better City and other carbon offset experts in the Greater Boston business community.



As the Commonwealth begins its post-pandemic economic recovery, uncertainty about the future of work trends and the related impacts on the real estate sector cannot be used as an excuse to further delay long-needed investment in public transit, which is the backbone of our regional economy. Additionally, COVID-19 recovery and financial uncertainty should not stymie state investment in the efficiency and decarbonization of our commercial, industrial, and institutional buildings. The Commonwealth must take bold action now to achieve our climate goals and to create the clean economy of the future.

Thank you again for your leadership and for your time and consideration.

Sincerely,

Richard A. Dimino  
President and CEO

Enclosures: 3

cc: Jamey Tesler, Acting Secretary, Massachusetts Department of Transportation  
Judy Chang, Undersecretary of Energy  
Steve Poftak, General Manager, MBTA  
Martin J. Walsh, Mayor, City of Boston  
Kim Janey, City Council President, City of Boston  
Chris Osgood, Chief of Streets, City of Boston  
Chris Cook, Chief of Environment, City of Boston

## ATTACHMENT A: Detailed Comments on Chapter 2 Transforming Our Transportation Systems

### **Summary Comments & Recommendations**

In their 2018 report, Governor Baker's Commission on the Future of Transportation stated that “high-frequency, high-capacity public transit is the most efficient and sustainable way to move large numbers of people as they go about their daily lives. This is true today and will be true in 2040.” However, the CECP strategies for reducing emissions from the transportation sector are almost exclusively focused on subsidizing zero emission vehicle purchases, dismissing the potential of reducing emissions through expanded access to public transit. The CECP’s one-dimensional focus on ZEVs does not adequately encourage near-term VMT reduction. Additionally, this approach does not mitigate the extreme roadway congestion that has crippled Greater Boston or make meaningful progress toward achieving transportation equity.

Also in 2018, A Better City and AECOM released the [“The Transportation Dividend: Transit Investments and the Massachusetts Economy”](#) report quantifying the economic benefits and value of the MBTA system serving Greater Boston. The report found that our public transit system returns economic benefits worth five times the cost of operations, and many of those benefits are experienced daily by residents. While past investments have paid off, without renewed, long-term investments, Massachusetts risks the ability to continue recover, grow, and thrive.

The final CECP must affirm the foundational principle of the Commission on the Future of Transportation report and seize the opportunity presented in The Transportation Dividend report by prioritizing investments in public transit to support our climate, mobility, and equity goals. As acknowledged in the CECP, the electrification of the MBTA commuter rail and bus system would make progress toward achieving our GHG reduction targets. However, the capital investments needed to achieve system-wide electrification are largely unfunded.

A Better City is grateful to sit on the Global Warming Solutions Act Implementation Advisory Committee (IAC) and to serve on the Transportation Working Group. Unfortunately, the vast majority of the [IAC Transportation Working Group's recommendations](#) are not reflected in the CECP, including the recommendation to increase investment to expand public transit and enhance multi-rider mobility programs and to assess and deliver smart roadway pricing strategies.

By focusing solely on ZEVs at the expense of other strategies, the draft CECP represents a missed opportunity to maximize co-benefits that will create a more vibrant, connected, and accessible Commonwealth for all. While the CECP must of course prioritize GHG reductions, it should do so by advancing strategies that can help achieve other interrelated objectives, including enhanced equity,



public health, mobility, economic development, and overall quality of life.

As such, A Better City urges EEA to revise the CECP to include a new standalone strategy to modernize, expand, and improve public transit throughout the Commonwealth and to decarbonize train and bus fleets, including the MBTA's commuter rail and bus system. Beyond prioritizing investment in public transit, the CECP should advance smart roadway pricing strategies; set more aggressive, annual VMT reduction targets for all passenger vehicle trips, not just for commutes; incentivize the electrification of commercial fleets, including delivery vehicles; incentivize the development of flexibly-designed commercial EV charging infrastructure, as well as the purchase of e-bikes; support Transportation Management Associations (TMA)-led transportation demand management (TDM) strategies as well as the development of active transportation infrastructure; and ensure the affordability of clean, reliable power via the grid.

### **New Strategy: Modernize, Expand, and Improve Public Transit Operations Throughout the Commonwealth and Decarbonize Trains and Bus Fleets**

- A Better City urges the Commonwealth to set a clear goal for “modernizing, expanding, and improving public transit,” not simply “investing in clean transportation solutions”—this should be a standalone strategy and the objective should also be woven into the other existing strategies, as appropriate.
- A Better City urges the MBTA to move forward with critical foundational investments to advance Regional Rail as endorsed by the Fiscal Control and Management Board in November 2019, including electrification of the commuter rail network, frequent all-day service, and accessible stations with high-level platforms. Full transformation of this mode could result an 150% increase in daily commuter rail boardings (+122,400 new transit trips), thus fewer vehicle hours and miles traveled and reduced congestion, reduced GHG emissions, and positive benefits to environmental justice communities in terms of accessibility, mobility, and environmental quality.<sup>1</sup>
- A Better City urges EEA to work with the MBTA and with local communities to identify sites along commuter routes that are suitable for transit-oriented development (TOD) and can also meet critical housing needs, reduce VMT, and support economic development objectives.
- A Better City implores the Commonwealth to prioritize the decarbonization of transit and other bus fleets and to provide new regulatory and financial incentives for the MBTA and RTAs. Such incentives should include: (a) reducing, if not eliminating, peak-load and peak-demand utility charges to public transit agencies for power used to fuel battery electric buses (BEB) vehicles and fleets; (b) taking necessary steps to immediately provide for off-peak utility pricing to public transit agencies for power used to fuel BEB vehicles and fleets; (c) requiring that all new public

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<sup>1</sup> <https://cdn.mbta.com/sites/default/files/2019-10/2019-10-18-rail-vision-advisory-committee-meeting-presentation-accessible.pdf>

transit bus maintenance facilities be designed and constructed with all electrical substation and conduits to enable direct current fast charging (DCFC) access for each BEB vehicle to be housed at any such new facility; (d) providing immediate and substantial direct financial incentives to the MBTA and RTAs to encourage purchase of BEB vehicles and fleets and install complimentary DCFC infrastructure as needed. See A Better City's August 2019 report "[New MBTA Bus Maintenance Facilities & Evolving Battery Electric Bus Technology, Case Study: Albany Street Garage](#)" for additional context and recommendations.

### **Strategy T1: Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions**

- A Better City supports the intent of this strategy—but recommends enhancing and expanding the proposed actions. As described above, A Better City urges the Commonwealth to set a clearer goal for “modernizing, expanding, and improving public transit,” not simply “investing in clean transportation solutions”—this should be a standalone strategy and the objective should also be woven into the other existing strategies, as appropriate.
- Regarding the currently proposed actions, A Better City supports and appreciates the Commonwealth’s leadership in establishing the Transportation and Climate Initiative Program (TCI-P), and urges the Commonwealth to strategically invest TCI-P revenue to modernize, expand, and improve public transit, and to provide active transportation and micro-mobility options, particularly serving transit-dependent communities. Further, A Better City urges the Commonwealth to engage directly with communities and with the business sector to identify and implement investment priorities.
- A Better City also supports the intent of establishing a regional Low Carbon Fuel Standard (LCFS), though additional information about program structure is needed. As new fuels are developed and distributed, A Better City encourages the Commonwealth to avoid potential negative impacts to environmental justice communities, many of which have been disproportionately burdened by the production, transport, and storage of fuel.

### **Strategy T2: Implement Coordinated Advanced Clean Vehicle Emissions and Sales Standards**

- A Better City supports the proposed implementation of the California Advanced Clean Cars II Standard, requiring that all new LDV sales must reach about 50% by 2030 and be 100% ZEV by 2035; the California Advanced Clean Trucks rule; and the California Advanced Clean Fleets rule. A Better City also supports the ongoing collaboration with other jurisdictions under the Zero Emission Medium- and Heavy-Duty Vehicle Memorandum of Understanding and Action Plan to provide a framework for achieving 30% of all new truck and bus sales being ZEVs by 2030 and 100% by 2050.
- As discussed above, A Better City implores the Commonwealth to prioritize the decarbonization of public transit and other bus fleets.

### **Strategy T3: Reduce Upfront ZEV Purchase Cost Burden**

- A Better City recommends that the Commonwealth take immediate steps to strengthen the proposed actions to commit to providing MOR-EV rebates at point of sale in 2021 and to commit to launching a low and moderate income (LMI) consumer program for ZEVs.
- A Better City recommends EEA consider extending incentives and rebates to include micro-mobility options like e-bikes.
- A Better City supports the development of a heavy-duty ZEV incentive program and again encourages the Commonwealth to prioritize the decarbonization of transit and other bus fleets.

### **Strategy T4: Deploy Electric Vehicle Supply Equipment & Enable Smart Charging**

- A Better City appreciates the intent of the proposed actions to build out and maintain the charging infrastructure needed to facilitate a widespread transition to ZEVs—but encourages the Commonwealth to also take a more aggressive posture in implementing (not just exploring, piloting, or analyzing) the critical incentive programs and rate structures.
- A Better City encourages EEA to launch a utility-based commercial charging incentive program. Additionally, A Better City recommends that DOER consider ways to encourage the development of charging infrastructure as part of the revised stretch energy code for buildings. As explored further in the buildings section of this comment letter, the development of the stretch energy code must be guided by robust stakeholder engagement from design, engineering, construction, and building operations practitioners.
- A Better City recommends that charging infrastructure be designed to accommodate multiple forms of electric vehicles, including smaller-scale micro-mobility options like e-bikes and e-scooters and low emission vehicles like e-mopeds and powered quadcycles, rather than favor a single form-factor.
- A Better City also emphasizes that the Commonwealth's efforts ensure the affordability of clean, reliable power via the grid and prioritize equitable access to charging infrastructure, including in environmental justice communities.

### **Strategy T5: Engage Consumers & Facilitate Markets**

- A Better City appreciates the intent of the proposed actions to increase consumer awareness and to catalyze the expansion of the clean transportation market—and encourages EEA to adopt a stronger focus on incentives and pilots to expedite commercial fleet conversion across the commercial, industrial, and institutional sectors.
- A Better City suggests that delivery sector opportunities include strategies to encourage the use of light-duty electric delivery vehicles like e-bikes and e-trikes.

## Strategy T6: Stabilize Light-Duty VMT & Promote Alternative Transportation Modes

- A Better City urges the Commonwealth to pursue a more aggressive VMT reduction strategy that is rooted in strategic, substantial investments in the modernization, expansion, and improvement of public transit. The Commonwealth should set annual VMT reduction targets for all passenger vehicle trips, not just for commutes.
- A Better City urges the Commonwealth to develop and implement a smart roadway pricing/toll equity strategy to encourage mode shift, raise additional revenue for public transit, and reduce roadway congestion. With the anticipated advances in fuel efficiency and potential growth in the use of electric vehicles, these policies indirectly threaten the long-term viability of the gas tax as a stable, robust, and predictable source of transportation revenue. Massachusetts must move toward roadway pricing as a stable source of transportation revenue to maintain and create modern and safe transportation infrastructure.
- A Better City recommends reinstating state funding for Transportation Management Associations (TMAs), which are uniquely positioned to advance employer-led efforts to coordinate the use of private shuttles and ferries to complement public transit and to encourage commuter transit use and active transportation.
- A Better City encourages EEA to coordinate with MassDOT and municipalities to invest in developing the infrastructure needed for commuters to safely choose active modes of transportation, including cycling. A recent A Better City survey, "[Anticipating Post-Pandemic Commute Trends in Metro-Boston](#)," showed that two thirds of respondents live 10 miles or less from their office, elucidating a tremendous opportunity for the Commonwealth to encourage active transportation options for Greater Boston commuters. MassDOT should be empowered to accelerate trail/off-road path construction to transform the Emerald Necklace into a regional superhighway.
- A Better City supports efforts to encourage and incentivize a broad range of smart growth policies, and encourages EEA to link these efforts with public transit investments, roadway pricing strategies, and transit-oriented development policies.

## ATTACHMENT B: Detailed Comments on Chapter 3 Transforming Our Buildings

### Summary Comments & Recommendations

A Better City's comments in this section are specific to strategies within the buildings sector, specifically relevant to commercial, industrial, and institutional buildings. These comments also assume that the version of the Climate Bill (S.30), currently on Governor Baker's desk, is ultimately signed into law.

The CECP strategies for reducing emissions from the buildings sector are almost exclusively focused on the electrification of thermal heating, which excludes huge hurdles ahead, including: deep energy building retrofits; workforce development; grid and building electric capacity; clean, reliable, and affordable electricity; and a statewide financing program or climate bank. As explored further in A Better City's June 2020 report "[Thermal Electrification of Large Buildings in the Commonwealth](#)," a variety of policies and strategies will be required to address the market barriers to thermal electrification technologies.

Therefore, in addition to the strategy-specific feedback outlined below, A Better City recommends that EEA develop stand-alone strategies for each of the following priorities:

- **Prioritize Deep Energy Retrofits:** Deep energy retrofits in commercial buildings are currently untested. We have worked diligently with members and partner organizations over the last two years to encourage the piloting of deep energy retrofits in different building typologies, without success. Although the CECP report states that about 40% of HVAC equipment is expected to retire in commercial buildings in the next decade and that for many of these buildings, heat pump systems will be the least-cost decarbonization option, our members have reported that without pursuing deep energy retrofits first, a heat pump system would at least double energy costs. Our members are also concerned that these costs will escalate with increased ventilation requirements post-pandemic. As these deep energy retrofits happen infrequently, A Better City recommends establishing a dedicated funding source beyond Mass Save incentives to advance deep energy retrofits in the commercial, industrial, and institutional sectors.
- **Establish Foundational Workforce Development Initiative:** The goals of the CECP cannot be accomplished without a strategic, comprehensive workforce development initiative to train our residents for the jobs of tomorrow. Although mentioned as an action item in Strategy B2 and Strategy B3, workforce development should be elevated to its own, stand-alone strategy with an emphasis on providing career training and placement for those in underserved and environmental justice communities. The specific skills that will be required include the design and construction of deep energy building retrofits; the design and construction of high efficiency buildings; the installation and operation of heat pump technologies; the installation and

maintenance of onsite renewables and the procurement of offsite renewables; and broadly-defined building operations. A Better City urges EEA to launch a comprehensive workforce development initiative in partnership with the private sector to uplift environmental justice communities and to fill the critically-needed jobs of the future. (See Strategy B2 below for additional feedback).

- **Expand Grid and Building Electric Capacity:** Grid and building electric capacity will both need to be expanded substantially to compensate for the anticipated increase in electricity demand from electrified buildings, as well as other soon-to-be electrified sectors of the economy, like transportation. As mentioned above, retrofits are essential to limiting this increase in energy demand within buildings, but even with retrofits, most buildings will require significant electricity capacity upgrades. To enable these upgrades, A Better City recommends that EEA prioritize the expansion and modernization of generation, transmission, and distribution infrastructure systems.
- **Ensure Clean, Reliable, and Affordable Electricity:** The provision of clean, affordable, and reliable electricity is a prerequisite for achieving a decarbonized buildings sector. As mentioned above, our members have reported that without pursuing deep energy retrofits first, a heat pump system would at least double energy costs. A Better City encourages EEA to use all available regulatory tools to ensure access to clean, reliable, and affordable electricity for residential and commercial customers alike.
- **Establish a Statewide Financing Program or Climate Bank:** Additional funding and financing models are needed to scale up building sector decarbonization. Although mentioned in Strategy B3, this statewide financing program for decarbonization needs to be elevated to its own strategy. A Better City encourages EEA to establish a comprehensive funding and financing strategy to support deep energy retrofits (including pilots of deep energy retrofits within commercial building typologies that do not currently exist), equitable workforce development, renewable energy generation and accessibility, clean heating, cooling and ventilation, and projects that advance both GHG reduction and climate adaptation. Additionally, EEA should remove barriers to building decarbonization in other state funding/financing programs, such as the Community Preservation Act and Massachusetts School Building Authority.

### **Strategy B1: Avoid Lock-In of Building Systems That Are Not 2050-Compliant**

A Better City supports EEA in developing a new high-performance stretch energy code to allow the Commonwealth to move toward net-zero for new construction in a deliberative, phased manner that is guided by expert industry input and enabled by the provision of incentives.

- A Better City does not support the timeline for a new high-performance stretch energy code to be presented to the BBRS in 2021 and that allows for Green Communities to opt in starting in 2022. We suggest the development and promulgation of a new high-performance stretch energy

code be extended to 18 months to align with the pending climate bill and the 10<sup>th</sup> edition of the Massachusetts Building Code.

- A Better City recommends launching a robust stakeholder engagement process to develop a phased update of the stretch energy code. This process should be guided by a technical advisory group of Massachusetts-based practitioners representing all facets of real estate and the real estate development process. Expertise reflected on the advisory committee should span the residential, mixed-used, commercial, and industrial sectors and include those familiar with energy-intensive building stock like universities, healthcare facilities, labs, and data centers.
- A Better City also recommends ensuring that the stretch energy code itself be structured in a phased manner to account for both technical and cost constraints—the cost-competitive availability of building technologies and the availability of reliable, clean, affordable power via the grid must lead these timelines. In general, the compliance timeline for the commercial sector should not be the same as the compliance timeline for the smaller-scale residential sector, as there are not currently sufficient examples of net-zero or extremely high performing large commercial buildings in our climate zone. Additionally, special considerations and hardship exemptions must be made for certain commercial and industrial building typologies like universities, healthcare facilities, labs, and data centers that operate 24/7 and have unique energy-intensive needs. Overall, the timeline should align with the MA Building Code 10th Edition, which is expected to be finalized in late 2022 /early 2023 through the BBRs.
- It is our understanding that this new high-performance stretch energy code would establish three codes in the near-term: the existing stretch energy code, the new high-performance municipal opt-in stretch energy code, and the base building code. In 2028, when the updated stretch energy code potentially becomes the base building code, then there will only be one code. ABC recommends clarifying this interplay in the CECP language.
- A Better City recommends requiring the provision of incentives to support stretch energy code compliance and technological innovation. Despite the strides made to date, we have been unable to identify tangible examples of large-scale, commercial/institutional net-zero building projects in our climate zone beyond the Boston University Center for Computing & Data Sciences.

### **Strategy B2: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems**

- While A Better City supports the broader alignment of the Commonwealth’s energy efficiency programs and climate targets, we believe that additional analysis is needed to assess the impact of phasing out combined heat and power (CHP) incentives on the limited commercial and

industrial (C&I) market segments that can still benefit from CHP's energy and non-energy benefits in the near-term, as well as the present lack of available alternative technologies and fuels that can meet these specific needs. CHP systems can provide substantial energy efficiency and resiliency benefits to large C&I building owners in key market segments (e.g., healthcare, manufacturing) and can be a crucial transitional option for hard to decarbonize buildings.

- A Better City therefore recommends reassessing incentives for gas-fueled CHP and that the energy-intensive market segments that benefit most from CHP have exemptions (e.g., by sector, energy use intensity, etc.) to any incentive rollback where the energy and resiliency benefits of CHP cannot be suitably replaced by other technology options.
- Additionally, we suggest as part of a CHP assessment that the potential role of and enhanced incentives for biogas in serving existing and new CHP systems are investigated. In particular, many businesses in Massachusetts generate and must properly dispose of significant quantities of food and other organic wastes, which could be harnessed to support increased availability of anaerobic digester gas to reduce the emissions impact of existing and new CHP systems.
- A Better City supports the need for refinement and enhancement of workforce development programs related to building decarbonization. However, what is proposed is not adequate to meet either the magnitude or the immediacy of clean energy workforce development needs if we are to meet the stated CECF goals. As discussed above, A Better City recommends that building workforce development and training be developed into a separate strategy to create the critically-needed jobs of the future, including the design and construction of deep energy building retrofits; the design and construction of high efficiency buildings; the installation and maintenance of heat pump technologies; the installation and maintenance of onsite renewables installation and the procurement of offsite renewables; and broadly-defined building operations.
  - A Better City also supports the emphasis on equitable workforce development in underserved and environmental justice communities. In particular, we support attracting and training young and diverse participants through increased outreach and collaboration with vocational and technical schools and increased funding for internships, apprenticeships, and other job placements. Roxbury Community College's [Smart Buildings Technology Program](#) is an excellent example of this. Broadening this clean energy workforce in the buildings sector—and proactively partnering with the private sector—will be critical in ensuring that a pipeline of trained workers is available to meet our targets.



### Strategy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions

- A Better City understands and appreciates that there is not a one-size-fits-all clean heating solution for buildings in Massachusetts and that not every building can currently be cost-effectively electrified.
  - We recently learned that the Commission and Task Force on Clean Heat are two separate entities and request this is made clearer in the CECP. Our understanding is that the Commission on Clean Heat will be made up of a range of stakeholders. We request this includes a diverse set of experience and skills that span the residential, mixed-used, commercial, industrial, and institutional sectors and includes those practitioners within buildings that are more difficult or expensive to electrify. Given our role working with large commercial building owners and tenants, we request including a representative from A Better City on the Commission. In addition to leading the Commercial Real Estate Working Group for the Boston Green Ribbon Commission, A Better City sits on the IAC buildings working group, is working with the City of Boston on the proposed Building Performance Standard for existing buildings, and sits on two of the technical advisory groups for Boston's Zero Net Carbon Standard for New Construction.
- A Better City also recommends EEA conduct a study of low-and zero-carbon fuels to understand how they could support building decarbonization, particularly in large commercial and institutional building types that are more difficult and/or more expensive to electrify. As stated in the Buildings Sector Report of the 2050 Decarbonization Roadmap, these technologies have constraints such as they are not readily available today, may take longer to scale, may face fuel supply limitation, or may be more expensive to use relative to operating an electric heat pump. However, it is important to understand the optimal application of hydrogen and other decarbonized fuels for these harder to decarbonize building types sooner rather than later.

## ATTACHMENT C: Detailed Comments on Chapter 6 Protecting Our Natural and Working Lands

### Summary Comments & Recommendations

Over the past year, A Better City has been actively engaging our member organizations, partner organizations, and stakeholders across all sectors around best practices for carbon offsetting. Due to climate commitments at the city- and state-level in Massachusetts, we know that up to 10% of emissions in the City of Boston under “net zero” could be accounted for through tools like offsets and up to 15% of statewide emissions could be compensated for by offsets come 2050. While the CECP for 2030 does not explicitly mention offsets, Strategy L4: Develop Market Sequestration and Accounting Frameworks will require the establishment of accounting and market-based structures like a regional offsetting program.

A Better City recommends establishing a new strategy within the natural and working lands chapter to develop offsetting best practices to inform the proposed market-based accounting frameworks for carbon sequestration referenced in Strategy L4. Particularly as Strategy L4 references a market-based framework that could operate at a regional scale in a way that allows the purchasing of “least-cost sequestration services from its neighbors across the Northeast,” it will be vital for the CECP to establish offsetting best practices at the state-level, as well as across the region. In particular, the Commonwealth will need to ensure that there is no double counting within the participating Northeast states and no “leakage” of emissions outside the accounting system’s region. Additionally, it would be helpful for offsetting best practices to align with existing U.N. Sustainable Development Goals (SDGs), to allow for stakeholders to also maintain their international climate commitments.

Finally, the CECP does not specify if Strategy L4 will solely address future emissions, or will also address the sequestration of historic emissions in the Commonwealth. A Better City recommends EEA provide further clarification on the scope of the intended market-based sequestration and accounting frameworks. More detail on recommended offsetting best practices and the CECP’s Carbon Sequestration Task Force may be found below:

- **Offsetting Best Practices:** These must prioritize market sequestration frameworks that are verifiable, transparent, equitable, and permanent in order to ensure an effective achievement of the CECP’s carbon sequestration goals. A Better City recommends:
  - Following the PAVER+ framework for offsetting, developed by the World Resources Institute, which stands for permanent, additional, verifiable, enforceable, and real offsets, with the additional “plus” capturing co-benefits beyond CO<sub>2</sub> emissions sequestration or avoidance. Such co-benefits could include air quality and health

benefits, stormwater retention and other ecosystem services, and local community workforce development, to name a few examples.

- Including the additional best practice of “contemporary relevance” or ensuring that any carbon credits sold and accounted for within the Northeast region are available at the time of sale, rather than realizing their full potential at a future date after the time of sale.
- Committing to a “no net loss” policy for natural and working lands at both a state-level and regional scale, to ensure that our existing carbon sequestration “sinks” are utilized to their best ability in order to accomplish our CECF sequestration goals.
- **Carbon Sequestration Task Force:** A Better City has engaged our member organizations across sectors as well as partner organizations interested in carbon offsetting over the last year. We therefore recommend that A Better City and other carbon offset experts in the Greater Boston business community be included on the Carbon Sequestration Task Force. As our members operate at the local, regional, state, national, and international levels, we believe that our expertise and research in offsetting best practices at various geographic scales and across different sectors’ needs will help to strengthen the outcomes of the Carbon Sequestration Task Force, due to convene in 2021.



Via Electronic Mail

March 22, 2021

Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
gwsa@mass.gov

Subject: Acadia Center Comments on the 2030 Clean Energy and Climate Plan, Chapter 3: Transforming our Buildings and Chapter 4: Transforming our Energy Supply

Dear Secretary Theoharides, Undersecretary Chang, and the 2030 Clean Energy and Climate Plan Team:

Acadia Center wishes to express all members of the team responsible for developing the draft 2030 Clean Energy and Climate Plan (CECP) as well as the groundbreaking and comprehensive 2050 Roadmap Analysis. These two efforts provide the Commonwealth and its stakeholders a solid basis upon which to advance climate policy. Please accept the following comments from Acadia Center on the CECP. Acadia Center's comments here focus specifically on Chapter 3: Transforming our Buildings and Chapter 4: Transforming our Energy Supply. In addition, we would like to draw your attention to Acadia Center's support for three other comment documents:

- Joint Comments on the 2030 CECP to Ensure Inclusion of Climate Justice
- Joint Comments on The Future of Gas
- Joint Comments on Transportation

## Overarching Comments

- With the likely passage of S.30 into law, Acadia Center recommends EEA update its Roadmap Modeling and 2030 CECP to account for the 50% economy-wide target and the new policies related to buildings, electricity supply and distribution; and
- Acadia Center urges EEA to refine the final CECP's specificity regarding how the state will achieve the components of the plan. This should include: establishing the timing for each action in the plan, identifying the agency or department responsible for overseeing the action, estimating any additional funding necessary, and determining the need for additional statutory or regulatory authority.

## Chapter 3: Transforming our Buildings

As Massachusetts prepares to implement an unprecedented policy program to reach zero net emissions by 2050, the targets included in the CECP for the buildings sector are appropriately ambitious. Acadia Center commends the Commonwealth for recognizing the critical role that a decarbonized commercial and residential building stock will play in reducing overall emissions. Buildings account for nearly a third of the Commonwealth's annual emissions. As the CECP recognizes, **rapid building electrification is the only reasonable way to eliminate these emissions.**

The CECP expects the building sector to make up the largest single sector for emissions reduction between now and 2030, totaling 9.4 million metric tons of CO<sub>2</sub>e, —40 to 45% of total reductions before 2030. These are audacious targets, and **Acadia Center thanks the Baker Administration for recognizing the scale and speed with which the Commonwealth will need to act.** However, the CECP's plans related to buildings raises a few concerns. Among them:

1. **The Commonwealth has yet to adopt a specific strategy** for electrifying one million homes and 300-400 million square feet of commercial real estate by 2030.
2. **A regulatory or legislative target will be necessary** to ensure rapid progress and jump-start the marketplace for zero-emissions-ready technologies in buildings.
3. The CECP identifies Mass Save as a key tool for expanding electrification, but **limitations in the program's design and cost-effectiveness accounting methods** may impede its ability to support the number of installations envisioned by the CECP.

### **Ambitious Goals Require Audacious Policies**

The goal of fully electrifying one million households and 300-400 million square feet of commercial real estate before 2030 is ambitious. This rate of transformation expects that about 40% of the Commonwealth's housing units—equivalent to nearly all of the 1,190,537 units that currently use oil, propane, or electric baseboard for heat<sup>1</sup>—will be converted to heat pumps in the next ten years.

**Acadia Center is concerned that there is no framework in place that can achieve this goal.** In 2019 and 2020, Massachusetts energy efficiency program administrators supported the installation of about 22,500 residential heat pumps—roughly 12,750 a year.<sup>2</sup> **More than 100,000 heat pumps will need to be installed annually** between now and 2030 to achieve the Commonwealth's target. This pace is more than 8 times faster than what the programs currently support, with no clear plans on how to ramp up to this pace.

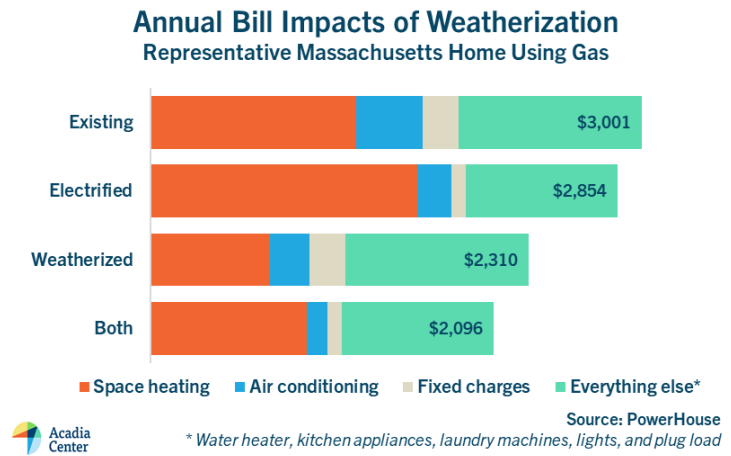
In the coming years, the Commonwealth will have a golden opportunity to reduce emissions from buildings while creating or preserving jobs and saving families money. **As the CECP recognizes, a comprehensive policy strategy will be necessary to maximize these benefits.** Acadia Center recommends that such a strategy contain the following elements:

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<sup>1</sup> U.S. Census American Community Survey. Public Use Microdata Sample 2019. Five-year estimates.

<sup>2</sup> Massachusetts Energy Efficiency Advisory Council, Quarterly Reports – 4<sup>th</sup> Quarter 2020 & 2019 Program Administrators' KPIs. (Accessed on March 3, 2021). <https://ma-eeac.org/results-reporting/quarterly-reports/>.

- More investment in weatherization.** Acadia Center strongly agrees with the draft plan’s emphasis on coupling electrification with weatherization in homes. Insulation and air sealing reduce electric demand from heat pumps, improve comfort, save money, reduce near-term emissions, and create local jobs. By electrifying and weatherizing at the same time, homeowners will benefit from more bill savings and lower up-front equipment costs. Up to 70% of housing units in Massachusetts were built before the first building energy codes were adopted, and a substantial proportion of those have not been insulated in the years since. Targeting these ultra-inefficient units for weatherization and electrification will lead to a huge reduction in emissions and significant energy burden relief. Slight revisions in the design of Mass Save programs to segment out and pursue potential participants in these buildings could be accomplished within the existing program framework, to the benefit of both consumers and the programs themselves.



- Heavy focus on education and awareness.** Consumer education is essential, and—if it comes from a trusted source—the most effective strategy to support development of the Commonwealth’s heat pump market. A robust consumer education program could provide objective, actionable information for home and business owners, spurring faster adoption of zero-emissions-ready equipment and allowing developers to take advantage of an expanding market. It will be important for the state to partner directly with HVAC contractors, who will be the main point of contact for most building owners considering an HVAC upgrade.

MassCEC’s [“Clean Energy Lives Here”](#) campaign is a good example of the type of easy-to-understand educational materials that the Commonwealth should consider devoting more resources to promoting. Additionally, it is crucial that any consumer education program provide information that is accessible to non-expert audiences and useful to homeowners and renters, low-to-moderate income households, and English-isolated households.

- Jobs and economic development.** The Commonwealth’s electrification goals represent a tremendous economic development opportunity. Investing in intensive weatherization and electrification work will support thousands of high-paying jobs. Before the pandemic began, energy efficiency supported 88,231 jobs in Massachusetts, but that number declined to 77,786 jobs by October 2020.<sup>3</sup> By investing heavily in weatherization and electrification, the Commonwealth can create meaningful work for people across the state, helping communities to “build back better.” Acadia Center especially supports the Commonwealth’s

<sup>3</sup> E4theFuture and E2. [“Energy Efficiency Jobs in America.”](#) November 2020.

efforts to encourage the use of union labor—or at the very least, prevailing wages—to capture the economic benefits of decarbonization for families.

### The Commonwealth Needs to Set an Electrification Target

The lack of a legal or regulatory requirement that codifies the Commonwealth’s building decarbonization goals **greatly diminishes their chances of success**. Without a goal to drive toward and to hold parties accountable, even substantial incentives may not generate an adequate pace of system replacement.

The draft plan identifies Mass Save as a primary vehicle for deploying electrification. **Acadia Center supports the DOER’s stated intention to phase out incentives for fossil fuel heating systems as soon as possible** and to end all fossil fuel heating incentives starting with the 2025-27 Plan. However, Acadia Center remains skeptical that Mass Save will be prepared to handle all—or even most—of the foreseen increase in building electrification without a separate, statewide regulatory framework that sets a clear trajectory away from combustible fuels. If the Commonwealth attempts to electrify its building stock mainly by harnessing slight shifts in consumer preference, it will not achieve the ambitious pace of heat pump installation set out in the CECP.

The absence of a regulatory standard for building electrification means that the programs must act as though all electrification projects occur incidentally as a result of consumer preference. Yet the CECP envisions that the transition will take place in large part because of government policy. **Without a clear standard, efficiency programs will be, in some ways, compelled to act as though that policy does not exist**, with the result that electrification efforts are erroneously seen as too expensive. One example, among many: Mass Save’s [BCR models](#) for the 2019-21 Plan assume that program-supported heat pumps replace functional heating equipment, but fossil fuel heating systems are assumed to be installed at end-of-life.<sup>4</sup> This makes the heat pumps seem more expensive by comparison, and hurts their cost-effectiveness. Real progress on electrification means taking full advantage of replace-on-failure situations, as the CECP acknowledges: “transitioning the buildings sector in a strategic and least cost manner... relies on immediately starting to leverage stock-turnover points.”<sup>5</sup>

Heat pumps face another challenge: while they dramatically reduce both fossil fuel consumption and emissions, convincing homeowners, landlords, and business owners to install them is more complicated—and therefore costly—than it would be for a more familiar product like a clothes washer or light bulb. While heat pumps are demonstrably cost-effective, particularly for homes that currently burn oil for heat, they may not be cost-effective enough to overcome the **extra resources that will be required to extend financial and technical assistance to 100,000 homeowners** and thousands of HVAC contractors each year. Even today, at 12,750 residential installations per year, the total cost of the heat pump measures delivered through Mass Save is about 20% administration, marketing, advertising, technical assistance, and evaluation research—32% in the low-income sector. The eight-fold increase in installations that the CECP envisions will almost certainly compound those costs. By setting and heavily publicizing a

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<sup>4</sup> Navigant. “Energy Optimization Measures and Assumptions Model.” Excel spreadsheet presented to the Massachusetts Program Administrators and Energy Efficiency Advisory Council, March 2020. [Accessible here](#).

<sup>5</sup> [Draft Clean Energy and Climate Plan for 2030](#). Page 28.

statewide electrification target, **the Commonwealth can remove this drag on Mass Save, leaving the programs to offer the maximum possible amount of financial assistance** for homeowners, landlords, and business owners.

The CECP does propose an electrification standard of sorts: a declining cap on emissions from heating fuels. **Acadia Center supports this proposal in principle, insofar as it could have the potential to drive adoption of heat pumps and other clean, electric equipment.** However, inconsistencies in the Commonwealth’s methods of tracking emissions—in particular, its inadequate way of accounting for the global warming impact of methane leaks in natural gas transmission and distribution systems<sup>6</sup>—may mean that such a program would lead to more oil-to-gas fuel switching. Such an outcome would be unacceptable. **Acadia Center will oppose this cap if it is not structured to support electrification specifically.**

**Both Maine and New York have adopted electrification targets.** Maine’s target, set in statute,<sup>7</sup> ensures that 20,000 air-source heat pumps will be installed each year until 2025—a significant goal in a state with slightly more than 500,000 housing units. New York State’s goal is set in an order<sup>8</sup> from the state’s Department of Public Service and targets an amount of fossil fuel displacement measured in trillion BTUs. **Acadia Center recommends that the Administration consider adopting a goal along these lines.** Doing so would send a clear signal to manufacturers, distributors, contractors, utilities, and consumers that the Commonwealth is serious about rapid electrification.

A statewide building electrification target may also be structured to make utility program administrators, or some other entity, responsible for a certain amount of progress on electrification. Currently, Mass Save PAs are held to account on the overall goals of each Three-Year Plan. The [2019-2021 Plan term sheet](#) sets a savings goal in lifetime MMBTU and commits to a certain number of heat pump installations, but electrification is not specifically included among the core terms of the Plan. **Setting core terms for electrification in the 2022-24 Plan, and tying them to performance incentives, will go a long way toward realizing the goals set out in the CECP.**

### **Tracking Progress on Electrification Can Help to Calibrate Policies**

Currently, the only data available on electrification of buildings comes from the Mass Save programs. As the market transforms, more heat pumps and heat pump water heaters will be sold without a program incentive. However, none of these data are currently tracked.

Acadia Center recommends that EEA and DOER consider working with the Commonwealth’s HVAC and plumbing distributors to track the number of heat pumps installed each year in Massachusetts, along with their characteristics—especially sale price and, for space heating equipment, heating capacity, efficiency, installation configuration (ductless or ducted, partial or full displacement of fossil fuels) and power draw ratings. Maintaining a database of heat pump installations will provide valuable insight into consumer and contractor preferences, which

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<sup>6</sup> See joint comments of Acadia Center and 33 other organizations pertaining to the future of natural gas in the Commonwealth.

<sup>7</sup> Maine Revised Statutes, Title 35-A, Part 8, Chapter 97, [§10119.2.A.2](#).

<sup>8</sup> New York Department of Public Service. Case # 18-M-0084: In the Matter of a Comprehensive Energy Efficiency Initiative. [“Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios Through 2025.”](#) Appendix C: 2020-2025 Heat Pump Budgets and Targets (Gross MMBTU). January 16, 2020.



could help the state and Mass Save PAs to design appropriate educational and training materials and orient programs toward the needs of the market.

Making the data public could even show skeptical consumers how many of their neighbors have electrified their heating system. Finally, it could provide useful data on whether the Commonwealth is on track to meet its 2030 goal. MassCEC could serve as a potential data aggregator, providing manufacturers and installers with standardized confidential reporting tools.

### High Electric Rates Will Limit Heat Pump Adoption

Electric rate design is a crucial component to successful and widespread deployment of heat pump technology. While electric heat pumps reduce overall residential energy consumption and emissions by eliminating fossil fuel use, they increase electric consumption, particularly in the winter. To protect consumers and incentivize further heat pump adoption, Acadia Center recommends that the Administration work with the Department of Public Utilities and investor-owned electric utility companies to **develop and support rate classes that are more favorable to electrification.**

According to DPU data,<sup>9</sup> residential basic service rates for energy—the part of an electric rate that varies over time—are between 22% (Eversource) and 28% (National Grid) more expensive in the heating season than in the warmer months. Yet Massachusetts homes will use much more electricity in the winter after electrification. Particularly as the grid becomes greener with more offshore wind and hydroelectricity that can keep up with winter peaks better than fossil fuels, electric rates should shift to further electrification. Designing electric rates with that in mind will help to **make the path to an all-electric future smoother** for the Commonwealth’s households and businesses.

### Equity in Everything—Especially Buildings

**The climate crisis is inseparable from the housing crisis,** and the Commonwealth must actively acknowledge this in all its greenhouse gas mitigation policies and programs. Acadia Center agrees wholeheartedly with the CECP’s characterization that:

“The ability of Massachusetts residents to participate in the transition to a low-carbon economy—such as owning an electric vehicle or retrofitting their homes to be more energy efficient—will differ according to income level, ability to access and benefit from available resources, location in urban and rural settings, proficiency in English, and previous marginalization.”<sup>10</sup>

Acadia Center would like to offer some input regarding policy and programmatic changes which may help to extend more of the benefits of energy efficiency to marginalized populations in the Commonwealth.

As it pertains to buildings, **a commitment to equity happens to overlap to a significant degree with a commitment to greenhouse gas mitigation.** This is due to a confluence of factors related to the state’s building stock and demographics:

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<sup>9</sup> <https://www.mass.gov/info-details/basic-service-information-and-rates>

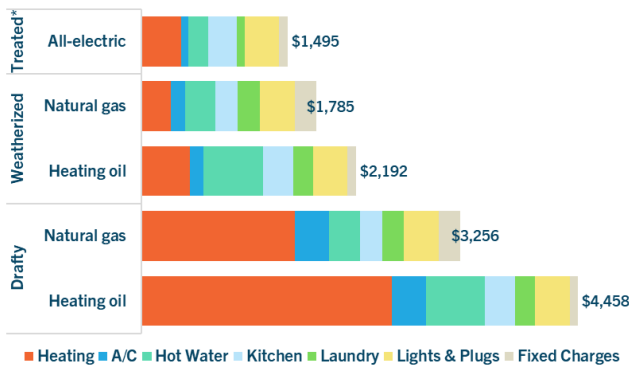
<sup>10</sup> [Draft Clean Energy and Climate Plan for 2030](#). Page 10.

- **Massachusetts' building stock is old.** Nearly 70% of housing units in Massachusetts were built before the first building energy code was adopted in the 1970s, and many have not been renovated since.
- **Less affluent people are more likely to live in older units.** About 80% of households that receive Medicaid or similar federal assistance live in a unit that was built before 1980, compared to 68% of households that do not receive assistance.
- **Less affluent households pay more of their income toward housing costs.** Rent represents, on average, 28% of household income for households receiving assistance, but just 8% for other households.
- **People of color** represent 19% of Massachusetts' population but 31% of people living in rentals and 31% of people receiving assistance.

Not all environmental justice communities live in substandard housing, and not all occupants of substandard housing are considered part of an environmental justice community. But for the nearly 30% of people of color in Massachusetts who both receive federal assistance and live in an old housing unit, **the same efficiency measures can dramatically reduce both energy burden and emissions.**

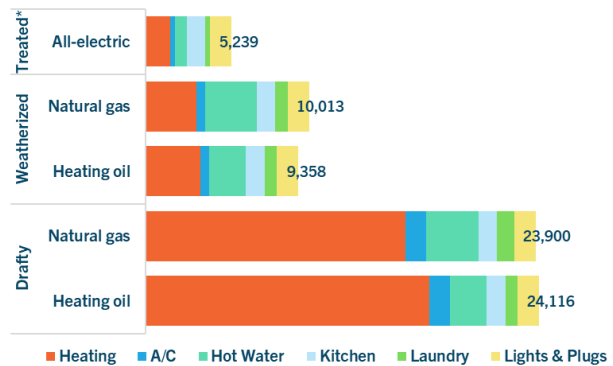
Acadia Center analysis shows that whole-home electrification and weatherization upgrades in older, draftier housing units can **cut energy bills by more than half while reducing emissions by 78%.** Meeting the Commonwealth's climate targets will undoubtedly require policies and programs that specifically target these units with increased attention and funding. Targeting electrification of housing in environmental justice and low-income communities will also be protective against those ratepayers bearing the majority of stranded costs in the wind down of the gas infrastructure system, and push market transformation toward heat pumps.

**Bill Impacts of Retrofits in a Drafty Home**  
Massachusetts: Dollars per Year



Source: PowerHouse  
\* Treated with whole-home electrification and weatherization

**CO2e Impacts of Retrofits in a Drafty Home**  
Massachusetts: Pounds of CO2e per Year



Source: PowerHouse  
\* Treated with whole-home electrification and weatherization

### Equity Within Mass Save

Acadia Center strongly supports the CECP's strategies related to equitable access to energy efficiency and clean heating, particularly the strategy action stating:

“DOER will work to expand access to energy efficiency and clean heating for low- and moderate-income renters and homeowners in EJ communities through targeted community-based incentives and outreach programs, and increased funding for pre-weatherization barriers.”<sup>11</sup>

As a long-time member of the Energy Efficiency Advisory Council, Acadia Center offers the following comments regarding how expanded access may be achieved.

The Green Communities Act requires that 10% of electric funding for energy efficiency and 20% of gas funding be spent on income-eligible programs. For over a decade, the Low-Income Energy Affordability Network (LEAN) has overseen the disbursement of these funds through the state’s community action agencies (CAP agencies) in collaboration with Mass Save program administrators. **In the current 2019-21 Plan term to date, the PAs have invested nearly \$200 million** into energy efficiency upgrades in households with an income at or below 60% of the state median. This crucial source of funding must be maintained and expanded.

Higher levels of attention and investment in environmental justice communities through Mass Save can be accomplished, in part, by focusing on the following factors:

- **Split incentive.** The split incentive, where landlords are reluctant to pay for efficiency upgrades when tenants will receive savings from lower bills, is a notorious and difficult barrier to serving rental units with energy efficiency upgrades. Many low- and moderate-income households in Massachusetts live in rental units like this. Providing free or sharply reduced-cost energy efficiency services to landlords would induce more participation but would not guarantee that the property owner would not still raise rents, as though he or she had paid the full cost of efficiency measures. Conversely, offering landlords the same incentives as any other building owner leaves many tenants without meaningful access to programs that they pay for through a charge on their energy bills. Mass Save PAs cannot address this issue on their own.

**The Commonwealth should consider stepping in and requiring properties offered for rent to meet a baseline level of efficiency improvement** before a certain date, then directing them to existing sources of financial assistance from Mass Save. Coupled with rent stabilization provisions, this could increase access to energy efficiency among renters to a substantial degree.

- **Targeting and qualification.** Prospective low-income participants often must produce an onerous amount of documentation to prove that they are eligible for program incentives. This level of granularity in means-testing is almost certainly discouraging potential applicants. Qualifying participants based on the median household income in their U.S. Census block group<sup>12</sup> would alleviate this unnecessary leg work, make it easier to households to participate, and lead to more energy savings and emissions reductions.

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<sup>11</sup> [Draft Clean Energy and Climate Plan](#). Page 31.

<sup>12</sup> Census block groups generally contain between 600 and 3,000 people. []

- **Health impacts.** A 2018 study<sup>13</sup> conducted on behalf of the Mass Save PAs quantified the non-energy benefits of home weatherization and heating system replacement for low-income households in Massachusetts. That study found, among other findings, that the non-energy impact of a reduction in asthma flares due to home weatherization has a value to society of \$11,531 for each treated home.

This study did not consider health and safety impacts from electrification measures like heat pumps and induction stoves, however. **Funding a study focused on the health impacts of this latter set of technologies can help the Commonwealth to ensure that it accounts for all the many benefits of treating low- and moderate-income homes with weatherization and electrification.**

- **Moderate-income households.** For the Commonwealth's energy efficiency programs, "low-income" is defined as a household with an income that is 60% or less than the state median. In 2021, this is equal to \$51,137 for an elderly couple living alone or \$75,201 for a family of four. This is a bright line test: a two-person household with an income of \$52,000, for instance, would likely pay the same customer cost share under the market rate (non-income qualified) program as a family making \$400,000. As programs in the 2019-2021 plan have shown, **extending enhanced weatherization and heating incentives to moderate-income households that make between 61% and 100% of the state median income could help to expand participation and target financial assistance where it is truly needed.** Studies have shown that these moderate-income households do not enjoy equal access to program incentives.<sup>14</sup>
- **Administrative cost relief.** Low-income energy efficiency programs are, on the ground, delivered by Massachusetts' CAP agencies. These agencies always operate at high capacity, but have been even busier than usual this year due to the economic devastation that the pandemic has brought. Meaningful investment in environmental justice communities must involve more administrative support and funding for CAP agencies.

## Chapter 4: Transforming our Energy Supply

Acadia Center wishes to commend the Commonwealth's commitment to reductions of emissions from the electric power sector. A successfully decarbonized electric grid will serve as the backbone to economy-wide decarbonization efforts in the building and transportation sectors. The CECP projects 4.2 MMTCO<sub>2e</sub> in reductions from the electric power sector by 2030, with offshore wind, solar, and new transmission to access Québec hydropower procured through Section 83(D) leading the way.

Acadia Center's comments focus on the need to ensure continued progress in meeting the Commonwealth's renewable energy procurement targets while ensuring proper siting and equity. In addition, Acadia Center's comments address the need for regional market reform and reform to the distribution-level system.

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<sup>13</sup> Three<sup>3</sup> and NMR Group, Inc. "[Low-Income Multifamily Health- and Safety-Related NEIs Study \(TXC50\) Preliminary Findings Report.](#)" October 15, 2018. Page 5.

<sup>14</sup> Navigant, Illume, and Cadeo. "[Residential Nonparticipant Market Characterization and Barriers Study.](#)" Prepared for the Electric and Gas Program Administrators of Massachusetts. February 27, 2020.

### Executing Renewable Procurements by 2030 and Reforming Regional Markets

The policy objectives embodied in Massachusetts' current clean energy commitments and envisioned for the next 10-30 years require a dramatically transformed approach to energy market design and transmission planning in a way that addresses the grid's impacts on equity and environmental justice. As detailed in strategy E1, timely executing solar and offshore wind programs and procurements alongside in-state and regional transmission investments will be key to the Commonwealth's success. Any substantial delay will negatively impact the Commonwealth's ability to meet interim targets and decarbonize its electric sector and broader economy by 2050. **In recognition of that strategy, Acadia Center stresses that it is crucial for the Commonwealth to continue procurements of offshore wind and solar resources, while considering additional state procurements, regional procurement coordination and engaging in efforts to reform the ISO-NE transmission planning, governance framework, and capacity markets.** Those processes, particularly at the ISO-NE level, are likely to take years, and this should not be a justification to pause or curtail renewable generation procurements in the meantime.

Acadia Center supports Strategies E2 and E3, which describe the Commonwealth's engagement in regional electricity market reforms, transmission planning, and increased transparency and other governance reforms. Proper coordination and transparency among the New England states will be critical to ensuring that Massachusetts is on-track to meeting its 2030 goal, but more importantly, that the Commonwealth and region is on track to meeting its goal of a fully decarbonized grid in the subsequent decades. The CECP builds on the New England Governors' Vision Statement and describes the existing flaws and shortcomings of the regional grid. Acadia Center agrees that strategies outlined in E2 and E3 must apply to future policies and has long advocated for reforms to ensure that clean energy resources are fully incorporated into and valued in the market.

Today, the state's commitments to large scale renewable energy generation are not being reflected in the regional electricity markets, so Massachusetts customers pay for additional resources in the ISO markets plus these resources under state procurements. Transmission planning updates similarly must focus on ways to rapidly and cost effectively deploy clean energy resources. As well, the state should prioritize addressing the current lack of consideration in the regional markets for the state's commitments to distributed energy resources, energy efficiency, and other advanced, customer-sited technologies. These clean resources can serve the regional market as energy, capacity, and non-transmission alternatives that will also enhance the resilience and reliability of the grid. If the region is unable to rapidly integrate clean energy resources like offshore wind into the grid, states' emission reduction targets will be undermined and consumers will bear additional climate risk along with health and economic burdens.

Acadia Center supports and has been an active partner in the New England Governors' Vision statement process, as well as in the "Transition to the Future Grid" initiative at ISO-NE, advocating for reforms to the organizational governance structure, improved equity and transparency, and much needed reforms to the capacity markets and transmission planning to fully value renewable resources. Acadia Center, along with a group of other environmental non-profits, submitted comments on [energy market reforms](#) and the need for improved [transmission planning](#) to the effectively and efficiently advance the priorities outlined in the October 2020 Governors' Vision Statement. Acadia Center's comments on governance reforms will be available on the [New England Energy Vision website](#) on March 26, 2021. Acadia Center requests that the comments submitted to the New England Governors be incorporated by reference into this submittal.

**Acadia Center urges EEA to push for the incorporation of equity and environmental justice principles in the consideration of reforms to governance, market rules, and transmission planning from the outset to ensure that any reforms do not add to the burdens borne by the region's most vulnerable residents.**

### **Clean Energy Imports**

Acadia Center supports the strategy articulated in E2 to limit emissions associated with imported electricity to 2 MMTCO<sub>2e</sub>. This implies that electricity with a high carbon content will be replaced with electricity with a low to zero carbon content. To properly account for and analyze the success of the Commonwealth in reaching that goal, Acadia Center requests that EEA express the imported electricity emissions cap for the 2030 generation target in terawatt-hours (TWh) and CO<sub>2e</sub>/MWh emission rate. Expressing this goal only as absolute metric tons of CO<sub>2e</sub> does not provide necessary clarity as to how the Commonwealth projects this reduction to happen. This will provide an estimate of the projected carbon intensity of the grid in 2030 that the Commonwealth expects and help determine the level of remaining gas-powered electricity that the Commonwealth expects to remain on the grid by 2030.

### **Solar Siting Opportunities**

Acadia Center supports EEA's attention paid to developing appropriate solar siting opportunities in the Commonwealth through 2025 and beyond, as laid out in strategy E4. The CECP correctly notes that the environmental and land-use impacts of ground-mounted solar will be significant in that Commonwealth, using an estimated 60,000 acres of land in Massachusetts by 2050, even with maximal rooftop deployment. A solar buildout of this scope requires that the Commonwealth adopt planning and siting criteria that protect natural space, greenfield sites, carbon sequestering forests, while also allowing solar development at the most optimal locations.

Solar power is one of the cleanest, most affordable sources of renewable, zero-carbon energy available to the region. Acadia Center supports efforts to prioritize brown-field over green-field sites, especially over farmland, forests, wetlands, and other habitat space. EEA should work to provide clarity, predictability, and assistance to communities, landowners, and developers in the Commonwealth by pre-screening potential sites that could address and significantly ease the possibility of siting challenges and delays. **Acadia Center recommends that EEA look to recent regional and state efforts to address appropriate solar siting as the starting point for guiding its next steps in advancing the development of this important resource.**

In 2019 and 2020, Acadia Center partnered with American Farmland Trust, Conservation Law Foundation, Vote Solar, and Vermont Law School on the [Smart Solar Siting Project for New England](#). The project convened stakeholders from all sectors, [completed detailed policy analyses, developed solar siting case studies, performed land use research, and evaluated equity impacts of solar project siting](#) – assessing the potential of each of the New England states to meet their climate and solar generation goals. Acadia Center published an analysis – [Meeting New England’s Solar Needs on Contaminated Sites and Rooftops](#) - detailing how much of the Northeast region’s solar generation goals could potentially be met through development of rooftops and contaminated sites as alternatives to development on farm and forest land. Acadia Center concluded that the state could meet its 26% of the state’s ground-mounted solar needed to meet its 2030 goals through projects sited on contaminated land. As well, installing solar on 22% of the state’s residential buildings could achieve the state’s 2030 rooftop solar target.

Another possible model is the New York State Energy Research and Development Authority’s recently released [Clean Energy Resources Development and Incentives “Build Ready” Program Implementation Plan](#). The program “...prioritizes the development of sites that commercial developers might elect not to pursue due to complicated development challenges, including those on existing or abandoned commercial sites, brownfields, landfills, former industrial sites, and other abandoned or underutilized sites.”

### **Municipal Light Plants Need Legislation to Bring them Under the Cap**

Municipal light plants (MLPs or munis) represent approximately 14% of the Commonwealth’s load, but are not currently subject to the GWSA targets, RPS, CES, or CES-E. Acadia Center supports strategy action E3 that includes mandating participation under the RPS, CES, and CES-E in a manner appropriate to MLPs’ specific circumstances. Transparent and comprehensive reporting requirements are also essential to ensuring that clean energy attributes are not claimed by both MLPs and the buyers of certificates sold by MLPs. The strategies in E3 will put the Commonwealth on track to meet its decarbonization goals, as well as to ensuring that every Massachusetts community does its share to reach the state’s carbon goals and benefit from the ratepayer and public health benefits of decarbonization, regardless of the entity delivering electricity to their homes and businesses.

### **Concerns Regarding Out-of-Region Hydroelectric Power**

Acadia Center acknowledges the role that hydroelectric power has the potential to play in the low-carbon grid of the future, particularly the Commonwealth’s contract for 9.5 TWh of eastern Canadian hydropower through the New England Clean Energy Connect (NECEC). The Commonwealth’s ability to remain on track to meeting its 2030 goal is dependent on the completion and interconnection of the NECEC line by no later than mid-2023.

However, the clean energy benefits of large-scale impoundment hydroelectricity, which comprises the majority of Hydro-Québec’s (HQ) electricity production capacity, should be more carefully and transparently documented. For example, analysis of two years of data from the New England Power Pool Generation Information System, which tracks renewable energy certificates, reveals that from 2018 to 2019 only 11% of imports into New England from HQ

were issued such certificates to confirm that they were low-carbon hydropower.<sup>15</sup> The remaining imported electricity lacks such documentation and is counted as undifferentiated system power.

Acadia Center's understanding is that HQ estimates that, through increased dam efficiency and overbuilding their hydroelectric system in anticipation of increased demand over the last two decades, about 25-30% of the existing system could produce power for additional export. While data that Acadia Center has reviewed suggest that existing, mature hydropower impoundments in cold, boreal climates like northern Québec produce low-carbon energy, science on methane emissions from newly-flooded hydro impoundments shows that they can create an initial emissions "bomb" as damaging to the climate as fossil-fuels.<sup>16</sup> Additionally, hydro reservoirs create major, permanent changes to watersheds and surrounding landscapes, which impact the biosphere and can disrupt traditional ways of life for First Nations communities. Acadia Center applauds the CECP's focus on environmental justice communities in the Commonwealth and underscores the importance of also addressing First Nation environmental justice issues in Canada. **Although HQ has not made public any near-term plans to create new impoundments, Acadia Center opposes procurements and other clean energy policies that would make eligible the additional buildout of hydroelectric impoundment dams in Canada and elsewhere.**

Any decarbonization scenario that is reliant on Canadian hydropower to meet decarbonization targets should also **require stringent attribute accounting and employ related safeguards to reduce uncertainty in the carbon content of imported hydropower.** Taking this step will ensure that these imported resources are not being backfilled in the Quebec control area with dirty fossil fuel powered electricity. Acadia Center, during the NECEC and 83D negotiations, was and continues to be strongly in favor emission tracking akin to NEPOOL-GIS tracking for zero-carbon and renewable resources.<sup>17</sup>

**Acadia Center encourages EEA and other stakeholders in Massachusetts to study the possibly of using existing and new transmission resources and existing Canadian hydropower as a bi-directional pumped storage resource.** Over the next decade and 30 years, Massachusetts and the New England region will invest heavily in offshore wind. While this resource has a high capacity factor, it is not always coincident with current peak electric demand, often producing the most electricity during the night and in the winter season. In addition to incentivizing offshore wind paired with storage, Massachusetts should explore the possible use of Canadian hydro resources as a grid balancing resource to further the Commonwealth's clean energy goals, regional decarbonization, and international cross-border cooperation.

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<sup>15</sup> New England Power Pool and APX, "NEPOOL Generation Information System GIS Certification Statistics for Imported Certification, 01/2018 – 12/2019,"

[https://www1.nepoolgis.com/myModule/rpt/ssrs.asp?rn=104&r=%2FPROD%2FNEPOOLGIS%2FPublic%2FNEPOOL\\_CertificateStatistics&apxReportTitle=GIS%20Certificate%20Statistics](https://www1.nepoolgis.com/myModule/rpt/ssrs.asp?rn=104&r=%2FPROD%2FNEPOOLGIS%2FPublic%2FNEPOOL_CertificateStatistics&apxReportTitle=GIS%20Certificate%20Statistics). (Accessed April 22, 2020).

<sup>16</sup> Ocko Ilissa, Hamburg, Steven. "Climate Impacts of Hydropower: Enormous Differences among Facilities and over Time". *Environ Sci Technol*. 2019 Dec 3;53(23):14070-14082. doi: 10.1021/acs.est.9b05083.

<sup>17</sup> Acadia Center reply brief on long-term contract for procurement of Clean Energy Generation, pursuant to Section 83D of An Act Relative to Green Communities, Massachusetts Department of Public Utilities Dockets 18-64, 18-65, 18-66 (April 3, 2019), <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/10562136>.



### Need for Distribution System-Level Planning

Acadia Center supports the incorporation of the GWSA targets into distribution system-level planning and policy considerations. Improvements to distribution system-level planning and grid modernization will be critical components of meeting the goals of the CECP and delivering consumer and environmental benefits, especially as buildings and vehicles are increasingly electrified and greater numbers of DERs are integrated. By conducting all-encompassing planning that considers customers' energy, capacity, and thermal needs, alongside social concerns like climate and justice, Massachusetts would be better positioned to achieve the CECP's ambitions and transform the Commonwealth's energy system. EEA must work with DPU, DOER, and the Attorney General's office to improve distribution level planning processes and ensure that cost-benefit analyses appropriately consider the benefits of achieving Net Zero by 2050. All the state agencies that play a role in distribution planning must be fully empowered to consider climate, health, and equity in their decision-making.

Acadia Center supports reforms to cost-benefit methodologies to fully capture the climate, equity, and health benefits of transitioning away from fossil fuels and towards cleaner alternatives. By not appropriately accounting for these benefits, outdated existing benefit-cost tests may limit progress towards the CECP's goals.

While grid modernization is a key piece of the CECP, grid modernization efforts to date in Massachusetts have been notoriously slow. For example, attempts to push for Advanced Metering Infrastructure (AMI) have been ongoing for years, without any significant progress made to date. AMI is an important and transformative tool in managing bi-directional energy flows and making use of the data that DERs can provide for grid operators. Massachusetts is far behind many other states in terms of its AMI deployment, and the DPU must accelerate its decision-making to deliver the benefits to ratepayers that AMI offers. Aligning utility business models and incentives with the state's climate goals will be essential for overcoming these barriers and contributing to the success of the CECP.

The recommendations and vision outlined in the CECP are vital for Massachusetts to meet its climate targets. It is imperative for the state to accelerate progress in transforming its energy system, especially given the many challenges from powerful incumbent stakeholders who would prefer the status quo. In a notable illustration of this position, Eversource Energy included the following warning in its 2021 10-K report:

“New technology and alternative energy sources could adversely affect our operations and financial results. Advances in technology that reduce the costs of alternative methods of producing electric energy to a level that is competitive with that of current electric production methods, could result in loss of market share and customers, and may require us to make significant expenditures to remain competitive. These changes in technology could also alter the channels through which electric customers buy or utilize energy, which could reduce our revenues or increase our expenses.”<sup>4</sup>

Clearly, Eversource considers technologies that would be beneficial for consumers and the environment as threats to its business model and financial prospects. This perspective is incompatible with the aims of the CECP. If Massachusetts is committed to meeting its climate targets, it must ensure that all stakeholders are positioned to act as partners in carrying out the goals of the CECP.

## Conclusion

In conclusion, Acadia Center requests that EEA:

- **Adopt a specific, realistic strategy** for electrifying one million homes and 300-400 million square feet of commercial real estate by 2030.
- **Establish a regulatory or legislative target for building electrification** to ensure rapid progress and jump-start the marketplace for zero-emissions-ready technologies in buildings.
- **Consider the limitations in the Mass Save program's design and cost-effectiveness accounting methods** that may impede its ability to support the number of installations envisioned by the CECP.
- **Revisit electric rate design** to ensure that electric rates reflect and support the Commonwealth's electrification policy goals.
- **Continue aggressive timelines and procurements of offshore wind and solar.**
- **Develop appropriate solar siting opportunities** in the Commonwealth through 2025 and beyond.
- **Work to include MLPs in meeting regulatory targets** in the GWSA, RPS, CES, and CES-E.
- **Require stringent attribute accounting** and employ related safeguards to reduce uncertainty in the carbon content of imported hydropower.

Sincerely,

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# Nuclear Energy's Role in Climate Change Policy

The consensus of the international community of climate scientists is that humans are influencing the global climate.<sup>1</sup> While the state of climate science is still maturing, the American Nuclear Society (ANS) believes that the risks presented by rising temperatures are sufficient to warrant enactment of policies designed to limit emissions of greenhouse gases into the atmosphere as a means of abating these risks.<sup>2</sup> ANS therefore supports the principal objective of recent international agreements on carbon dioxide emission reductions, along with state and federal initiatives designed to reduce greenhouse gas emissions from human activities.

ANS supports policies designed to reduce greenhouse gas emissions that are performance-based and technology-neutral. Nuclear energy (which provides much of the U.S. non-emitting generation) should be considered on the same basis as other non-emitting energy technologies. ANS believes that nuclear energy has a crucial role to play in addressing the global need to reduce emissions. Policies should evaluate energy sources based upon their ability to contribute reliably to meeting emission-reduction targets. ANS's recommended role for nuclear energy is consistent with recommendations by the Nuclear for Climate Initiative<sup>3</sup> by the Declaration from Nuclear Societies,<sup>4</sup> and by the International Panel on Climate Change<sup>1</sup>

Nuclear energy delivers economically competitive electricity with no greenhouse gas emissions during electricity generation operations and has among the lowest lifecycle greenhouse gas emissions of any energy source.<sup>5</sup> Nuclear energy is the only energy technology with worldwide potential for growth that has a proven record of delivering large amounts of reliable electricity without greenhouse gas emissions. ANS believes that nuclear energy is an important tool in reducing emissions and will make major contributions under well-composed technology-neutral emission-reduction policies.

Several states have enacted policies that compensate electricity generators for producing electricity without emitting greenhouse gases (e.g., zero-emission credit programs).<sup>6</sup> ANS supports these policies, which recognize the value of nuclear energy in a reliable, affordable, low-emission electric power system. Unfortunately, some governments have mandated preferential treatment for specific technologies and/or fuel sources (e.g., wind and solar) but have not provided comparable support for nuclear energy despite its ability to reduce carbon emissions.

Performance-based policies, which clearly define the outcome as opposed to selecting the technology, help to properly value electricity that is generated by nuclear plants and support nuclear plants that may be facing closure due to economics.<sup>7,8</sup> ANS has developed a "Nuclear in the States Toolkit" that outlines policies related to new and existing nuclear reactors for policymakers to consider as they develop policies to reduce emissions.<sup>9</sup>

ANS recognizes the value of energy diversity and believes that other energy technologies should be deployed as appropriate while acknowledging the full range of benefits and drawbacks associated with each technology. For example, the need for dispatchable backup electricity generation capacity, such as natural gas or energy storage capabilities, must be considered for intermittent generation sources, such as solar and wind. Further, attributes like reliability, resilience, and land use requirements constrain the contributions of inherently diffuse energy sources.<sup>10</sup> In all cases, policymakers should base energy generation choices on the complete set of attributes of energy technologies.

As the world recognizes the need to decarbonize our energy supply, combustion processes will be replaced by non-emitting processes to generate electricity. Nuclear power should be a key element of the effort to meet the need for non-emitting electricity production.

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Boston, MA 02114

RE: Interim Clean Energy and Climate Plan for 2030

The Northeast Clean Heat and Power Initiative (NECHPI), along with 2G Energy, AB Energy USA, the Combined Heat and Power Alliance, Dalkia Aegis EDF Group, Energy Spectrum, and Tecogen, respectfully submits the following comments in response to the Interim Clean Energy and Climate Plan for 2030 (2030 CECP). These comments address the proposed phase-out of incentives for fossil-fuel heating systems between 2022 and 2024, and the benefits of Combined Heat and Power (CHP) systems even as the electric grid decarbonizes. We urge the Executive Office of Energy and Environmental Affairs to revisit its proposal to end incentives for CHP, and continue rewarding high efficiency, environmentally superior CHP systems.

CHP systems participating in Mass Save and the Alternative Portfolio Standard programs provide a suite of benefits to ratepayers that will still be realized up to, and potentially beyond 2050. They reduce the emission of CO<sub>2</sub> and other criteria pollutants, as well as providing on-site electric and thermal resiliency. We suggest as one resource examining the benefits that are quantified for CHP projects that have received the Mass Save incentive, and urge that the Executive Office of Energy and Environmental Affairs utilize program information on CO<sub>2</sub> reductions from CHP in their decision of whether to continue incentivizing projects. Another, albeit anecdotal, data resource are the several US EPA CHP Award winning projects based in Massachusetts that have self-certified significant CO<sub>2</sub> reductions as well as dozens of Massachusetts businesses that have made public statements on the CO<sub>2</sub> reductions from their CHP investments.

CHP provides a significant CO<sub>2</sub> savings relative to current Massachusetts grid emissions. The NE-ISO Load-Weighted Marginal Unit (LMU) marginal emission rate for 2018 was 745 lbs. CO<sub>2</sub>/kWh, and the eGRID Non-Baseload emissions rate for the NE ISO, which is used to calculate CO<sub>2</sub> savings from Mass Save projects, is 931 lbs. CO<sub>2</sub>/kWh. According to a 2019 study by ICF, *As the Grid Gets Greener, Combined Heat and Power Still Has a Role to Play*, CHP emissions are estimated at 652 lbs. CO<sub>2</sub>/kWh when accounting for offset boiler emissions. Using either 745 lbs. CO<sub>2</sub>/kWh or 931 lbs. CO<sub>2</sub>/kWh, CHP provides a significant CO<sub>2</sub> savings, and will

until marginal grid emissions are drastically reduced.

This savings relative to marginal grid emissions, combined with CHP's high capacity factor, leads to significant CO<sub>2</sub> savings, even compared to the same MW of installed wind and solar. According to a study by Entropy Research, LLC. 10MW of CHP with an 85% capacity factor can provide 33,533 tons of CO<sub>2</sub> savings compared to eGRID non-baseload emissions on an annual basis. For comparison, the same study found that 10MW of solar with an average capacity factor of 26.1% saved 17,159 tons of CO<sub>2</sub> annually, and 10MW of wind with an average capacity factor of 37.4% saved 24,501 tons of CO<sub>2</sub> annually. CHP can provide nearly double the carbon savings of solar and a 50% increase in savings compared to wind, for the same number of MW installed.

CHP systems also provide savings in the wholesale energy and capacity markets, and by decreasing energy imported from outside Massachusetts, keeping dollars in the state economy. CHP systems can reduce transmission and distribution costs, both for reduced capital expenditure in congested areas and in reduced O&M costs, benefiting ratepayers and increasing grid reliability. Investing in CHP also provides direct and secondary economic benefits to the state economy through industry design and construction jobs, as well as service jobs. We suggest that the FULL picture of the benefits of CHP, vis-à-vis all other clean heating and cooling technologies, ought to recognize these important ratepayer and societal benefits

CHP uniquely provides a suite of benefits to ratepayers that include the following:

- Reduction in criteria pollutants,
- Reduction in CO<sub>2</sub> (greenhouse gas) emissions,
- Power and Thermal Energy **resiliency** for appropriately designed CHP systems,
- Economic multiplier benefits (importing less energy) keeping dollars in MA economy,
- Local job creation, direct industry jobs, service jobs,
- Critical infrastructure support including health-care, hospitals, research, pharmaceuticals, key supply chain products and services,
- Energy and capacity savings,
- Reduction in utility transmission and distribution (T&D) capital costs benefiting ratepayers,
- Reduction in utility T&D operating and maintenance costs benefiting ratepayers, and
- Reduction in local T&D congestion, enhancing the network reliability.



Sincerely yours,

*John Moynihan*

John Moynihan  
Chair, NECHPI Board of Director

*Co-signed:*

2G Energy

AB Energy USA

Combined Heat and Power Alliance

Dalkia Aegis, EDF Group

Energy Spectrum

Tecogen



Honorable Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114  
Sent by email to [gwsa@mass.gov](mailto:gwsa@mass.gov)

March 22, 2021

RE: Comments on 2030 Clean Energy and Climate Plan

Dear Ms. Theoharides,

The Partnership for Policy Integrity (PFPI) offers the following general comments and specific policy recommendations on Massachusetts' Interim Clean Energy and Climate Plan for 2030 (CECP).

General comments about the 2030 CECP:

1. The CECP fails to address the immediacy of the climate emergency. The Plan should provide steps for immediate action, for both short-term and long-term goals. The Plan needs to clearly identify solid targets that can be measured so the implementation can be tracked and resources allocated as needed to accomplish the goals.
2. The CECP relies on assumptions developed in the 2050 Decarbonization Roadmap that were not subject to public review and comment. Flaws in these assumptions have been carried over into the 2030 CECP, resulting in a Plan that is not as ambitious as it needs to be to achieve the goal of net zero emissions by 2050.
3. All footnotes and references should have live links (hyperlinks) to the source documents or research papers listed so that readers can verify the referenced information. EEA should ensure that all cited materials are readily available and in the public domain, or make sure the cited info is linked and accessible under the fair use doctrine.

### **Chapter 3. Transforming our Buildings**

#### **Strategy B2: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems**

Comment: PFPI strongly supports the state's goal to decarbonize the building sector, with an emphasis on deep efficiency and electrification. However, the 2030 CECP is curiously silent on the issue of residential and commercial wood-burning for heat.



Wood stoves and boilers are a major source of air pollution in Massachusetts, placing children, the elderly, and people with heart and lung disease particularly at risk. Even the most efficient wood boilers release large quantities of fine particulates (soot) and other air pollutants. According to EPA's National Emissions Inventory, in 2014, wood heating accounted for 83% of all PM<sub>2.5</sub> emissions in the heating sector in Massachusetts and a quarter of the state's total PM<sub>2.5</sub> emissions.<sup>1</sup> Burning woody biomass to produce heat or electricity emits far more CO<sub>2</sub> than fossil fuels yet is currently incentivized through a number of state programs intended to reduce greenhouse gas emissions.

Massachusetts currently subsidizes the installation of wood heating systems through rebates and grants issued by the MassCEC and Alternative Energy Credits funded through the Alternative Portfolio Standard (APS). In recent years, Massachusetts has spent millions of dollars to fund infrastructure for wood fuel production and promote wood-heating in Massachusetts.

Recommendation: Wood-burning is not "clean heating" under any scenario. Massachusetts must immediately realign its incentives to support the goals of decarbonizing the building sector, including removing incentives for wood heating. Massachusetts must remove woody biomass from eligibility from the Alternative Portfolio Standard (APS) by 2022 at the latest. Woody biomass and biofuels derived from waste products must not be treated as having zero carbon emissions.

### **Strategy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions**

Comment: PFPI supports imposing a long-term, declining cap on heating fuel emissions. However, the plan only addresses emissions from fossil fuels (gas, oil, and propane).

Recommendation: The cap must also apply to carbon emissions from the combustion of wood and biofuels. The EEA should begin the process of promulgating regulations under the Global Warming Solutions Act (GWSA) that will ensure the annual aggregate decrease in greenhouse gas emissions from the heating sector, including from biomass combustion.

## **Chapter 4. Transforming our Energy Supply**

### **Strategy E3: Align Attribute Markets with GWSA Compliance**

#### ***Stop subsidizing the false climate solutions of burning garbage and woody biomass***

PFPI strongly supports the recommendation of the GWSA Implementation Advisory Committee that Massachusetts remove woody biomass and garbage incineration from the Renewable Portfolio Standard (RPS), the APS, the Clean Energy Standard, and the Clean Peak Standard by 2022. These technologies are inconsistent and in opposition to the goals of the CECP, both from a climate standpoint and from an Environmental Justice perspective.

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<sup>1</sup> <http://www.pfpi.net/massachusetts-tops-northeast-in-air-pollution-from-wood-burning>

While biomass energy is only a small fraction of the renewable energy currently subsidized under Massachusetts' Renewable Portfolio Standard (RPS), this could change under regulatory amendments proposed by the Department of Energy Resources (DOER) that will allow inefficient biomass power plants such as the one proposed in Springfield, MA to qualify if they burn primarily "non-forest derived residues." This is a significant rollback of the science-based biomass eligibility criteria that the state adopted in 2012. The 2030 CECP is silent on the issue of biomass energy, which is puzzling considering that the DOER submitted these rule changes on December 4, 2020, just weeks before the CECP was released.

The 2050 Decarbonization Roadmap seeks to erase all the carbon emissions from biomass fuels that are derived from so-called "wastes." The modeling and emissions accounting for biogenic fuels in the Roadmap assumes that burning waste products for energy will have zero carbon emissions. This is a false assumption, in particular with regard to wood wastes (this is addressed in more detail in our comments on L4). The Manomet report commissioned by the DOER and subsequent studies have found that burning woody residues will have a net increase in carbon emissions for decades.<sup>2</sup>

Biomass power plants and garbage incinerators emit more carbon dioxide and harmful air pollutants per unit of energy than coal plants and are disproportionately sited in Environmental Justice communities. Neither garbage nor woody biomass should be considered either clean or renewable sources of energy. The stated goal of the MA Solid Waste Master Plan is to eventually attain zero waste production; therefore, it is essential that the 2050 Roadmap and 2030 CECP conform with the necessity to eliminate municipal solid waste combustion from the electricity sector. This will require a range of waste reduction policies, including finding alternate sources of funding to support municipal recycling programs and expanding extended producer responsibility programs. Addressing the issue of biomass combustion is simpler, because the state currently does not rely on biomass energy, and there is no wood waste "problem" that needs to be addressed. There are no wastes in nature. Letting forests grow naturally, and reducing, eliminating, and recycling our waste, are real climate solutions.

## **Chapter 6. Protecting our Natural and Working Lands**

### ***Protecting existing forests is essential for carbon storage and meeting our net-zero goals***

The 2030 CECP fails to provide a coherent and workable plan that will ensure forests will be able to meet the challenge required to achieve carbon neutrality by 2050. Massachusetts should maximize carbon storage on the approximately one million acres of publicly-owned forest lands by immediately and permanently protecting them from commercial exploitation and putting these lands into a Carbon Reserve Program. The plan should also include policies to reduce or eliminate incentives for logging on private forest lands and switch to a carbon-based incentives program to promote proforestation through the use of reduced taxation (Chapter 61"C") and enrollment in carbon credit markets that provide non-timber income to property owners. The CECP should promote policies that keep forests intact and stop promoting more consumptive uses of forests like developing markets for biomass energy and "junk wood," or production of cross laminated timber (CLT) and other "durable

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<sup>2</sup> Thomas Walker, *et al.*, Manomet Ctr. For Conservation Scis., Biomass Sustainability and Carbon Policy Study (2010) <https://www.mass.gov/files/documents/2016/08/qx/manomet-biomass-report-full-hirez.pdf>; Mary S. Booth, Not Carbon Neutral: Assessing the Net Emissions Impact of Residues Burned for Bioenergy, 13 ENVTL. RES. LETTERS 035001(2018), <https://iopscience.iop.org/article/10.1088/1748-9326/aaac88>

wood products” that degrade current carbon storage by forests and reduce future potential carbon capture capacity. The best and largest trees that will be targeted for consumptive uses are the very trees that are essential to keep in place as they rapidly increase their carbon removal and storage rates, if we are to ensure that the Commonwealth will be net-zero or net-negative by 2050.

## 6.1 Sector Overview

1. The Land Sector Technical Report for the 2050 Decarbonization Roadmap failed to provide a meaningful analysis of existing carbon stocks, potential sequestration and carbon storage, and the analyses that were provided were based on faulty assumptions and biased projections. For instance, the report failed to ground the analysis within the existing framework of the Global Warming Solutions Act which establishes the 1990 Baseline emissions levels as the benchmark for reductions comparison purposes. Instead, the Land Sector Technical Report uses “business-as-usual” as the baseline for comparison, creating an arbitrary comparison that makes it difficult to integrate into the existing climate policy and regulatory framework. This framing also accepts the current path instead of advocating for a new pathway forward, which is the overarching purpose of the Decarbonization Roadmap. The business-as-usual model, like everything else under consideration, should not be accepted as the preferred new direction needed to address the existential climate emergency. Thus, while the Land Sector report contains some useful information, it is not presented in a meaningful context for the purposes of identifying the necessary steps that need to be included in the 2030 CECP. The failure on the part of Harvard Forest to synthesize and present the 1990 baseline emissions profile for the land sector, even after more than twelve years have elapsed since the passage of the GWSA, means that much of what was produced has little direct application to the strategies and specific policies, regulations, or laws that need to be adjusted or enacted to ensure real GHG reductions from the land sector, while promoting verifiable carbon storage benefits. The Land Sector Technical Report should be redone by a qualified consultant that has the capacity to conduct an unbiased analysis within the framework of existing laws, regulations, and policies, with an effort to meet or exceed projected net-zero goals for atmospheric carbon removals using existing lands within the Commonwealth. This failure of vision is clearly signified by the projection that the Roadmap ultimately relies on out-of-state purchases for half or more of the carbon credits needed to reach net-zero. A meaningful analysis and report would have identified and developed the steps necessary to reach net-zero utilizing changes to policy and regulations, including any legislative fixes needed, to ensure that the Commonwealth’s forested urban and rural lands play a maximal role in regards to carbon sequestration and long-term carbon storage. To do otherwise is a missed opportunity of immense proportions.

2. The Land Sector Technical Report also incorporated faulty assumptions, as indicated by statements which project that logging results in “enhanced growth” and “enhanced sequestration” which implies that more logging and forest degradation will result in more carbon withdrawals and storage. Such assumptions are offered as simple statements without reference, indicating a general bias towards landscape scale management activities which have been shown to actually reduce carbon capture and storage, and such activities have also been identified as significant sources of GHG emissions in their own right. While the science of forest carbon management continues to evolve, the report failed to include some of the key established principles, such as findings by Nunery & Keeton<sup>3</sup> (analysis of intensity and frequency of logging disturbance), Moomaw, et al.<sup>4</sup>

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<sup>3</sup> Nunery, Jared & Keeton, William. (2010). Forest carbon storage in the northeastern United States: Net effects of harvesting frequency, post-harvest retention, and wood products. *Forest Ecology and Management*. 259. 1363-1375.

(concept of “Proforestation”), and Mildrexler, et al.<sup>5</sup> (the role of large trees in carbon storage), among many other recent research findings.

3. A final significant flaw of the Land Sector Technical Report is that the analysis failed to differentiate between the vastly different areas related to policy, regulatory, and legal aspects of public vs. private forested lands. By lumping all forested lands into the same analysis without making such a clear distinction, the report missed one of the most accessible avenues for immediate policy adjustment, namely the control that the EEA exerts over lands owned by the Commonwealth. Such an omission results in a report that is fundamentally flawed, as the analysis intentionally treats all forested lands as essentially the same, an astounding oversimplification with far-reaching policy and climate impacts. The aggregate acreage of publicly-managed forested lands amounts to approximately 30%, and could be more if municipal lands were included. Immediate designation of most public lands, especially those controlled by the EEA, as part of a carbon reserve system would set the stage for increasing levels of carbon capture and storage during the next three critical decades, as these forests recover and continue to mature. For this reason alone, the Land Sector analysis should be redone in order to be meaningful to the efforts of the Commonwealth in this attempt to address the climate emergency.

4. If it is true that protecting forests “is among the most important considerations for the Commonwealth with respect to ensuring it has sufficient sequestration to achieve Net Zero by 2050” (CECP, page 48), then it is likewise highly important that a solid analysis be conducted to guide the obvious role of our in-state forests in our efforts to attain net zero by 2050. Using a defective and out of date Land Sector analysis as the basis for the 2050 Decarbonization Roadmap and the 2030 Clean Energy and Climate Plan means that proposed actions, necessary adjustments, and significant changes are built upon an unstable foundation which does not support the actual conditions nor properly realizes the potential opportunities that are available.

### **Strategy L1: Protect Natural and Working Lands**

Comment: The Plan confuses terms such as “natural”, “protecting”, “conservation”, and “protected”, resulting in a less than precise definition of this “protection” concept which then allows for misinterpretation and misunderstanding, leading to extensively muddled and ambiguous outcomes. “Protected Lands” should mean those that are protected from commercial exploitation and degradation, especially in light of their functions related to the climate and carbon storage. Forests that are “protected” should not include those that are also considered “working” lands, and likewise “working” forests should not be lumped into the category of “protected” since while such working lands may be protected from housing development, they are clearly not protected from the chainsaw and thus their carbon stocks are subject to intensive degradation, both short-term and long-term. State-owned forest lands are not subject to the same development pressures as private lands and thus can immediately be enrolled in a long-term carbon reserve system.

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10.1016/j.foreco.2009.12.029. [https://www.uvm.edu/giee/pubpdfs/Nunery\\_2010\\_Forest\\_Ecology\\_and\\_Management.pdf](https://www.uvm.edu/giee/pubpdfs/Nunery_2010_Forest_Ecology_and_Management.pdf)

<sup>4</sup> Moomaw WR, Masino SA and Faison EK (2019) Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good. *Front. For. Glob. Change* 2:27. doi: 10.3389/ffgc.2019.00027  
<https://www.frontiersin.org/articles/10.3389/ffgc.2019.00027/full>

<sup>5</sup> Mildrexler DJ, Berner LT, Law BE, Birdsey RA and Moomaw WR (2020) Large Trees Dominate Carbon Storage in Forests East of the Cascade Crest in the United States Pacific Northwest. *Front. For. Glob. Change* 3:594274. doi: 10.3389/ffgc.2020.594274 <https://www.frontiersin.org/articles/10.3389/ffgc.2020.594274/full>

Recommendation: Include a precise definition of what is meant by “protected” in regards to Natural and Working Lands. Differentiate between publicly-owned lands and private lands where the policy opportunities are vastly different and the capacity to enact immediate change does not require the passage of additional legislation. Clearly identify the types of forest impacts that need to be reduced, based on the intensity and frequency of such impacts, as these factors have everything to do with the carbon flux of forests, forest vegetation, and below-ground carbon storage in forest soils. Provide actual goals and mileposts for reduction in impacts so that progress can more easily be measured during the decade. Provide adequate funding to accomplish the actions associated with this strategy.

### **Strategy L2: Manage for Ecosystem Health and Enhanced Carbon Sequestration**

Comment: As previously stated, the Plan fails to differentiate between public lands management and privately owned lands. While the Healthy Soils Action Plan and the Resilient Lands Initiative appear to be ongoing research and planning efforts, the CECP should identify existing available information that can be immediately put into practice to increase retention and storage of increasing quantities of carbon, especially on our publicly-owned forests. In addition to planning numerous long-term research projects, the Plan should identify the current science related to forest carbon and implement active measures now, instead of waiting for several years of research to be completed and interpreted. This wait and see approach will only waste years of valuable time and represents an enormous lost opportunity.

Recommendation: For publicly-owned lands, the existing public lands logging program funding and staff should be redirected towards quickly establishing a Carbon Accounting and Verification Team that can begin the process of assessing public lands for their sizable role in addressing the climate emergency. Existing staff can be given additional training in order to be able to quickly inventory existing carbon stocks and begin the process of establishing a MA Carbon Reserve System, which can include the potential for enrolling public lands into a qualified Carbon Market system. For private lands, immediately initiate the process to revise the DCR Best Management Practices under the Forest Cutting Practices Act (FCPA, C. 132, s. 40-46) to incorporate updated science on forest management and carbon fluxes. Actual science-based practices should be provided that address the need to protect existing carbon stocks and increase carbon storage capacity of the forests and soils through 2050 and beyond. Incentives should be shifted to efforts that actually and consistently protect the ability of forests to increase long-term storage of carbon. The best policy that the EEA could adopt can be summarized as “Leave it in the Forest” when it comes to the climate impacts of logging and burning our existing carbon sinks.

### **Strategy L4: Develop Sequestration Accounting and Market Frameworks**

Comment: While it is laudable to plan for the development of a perfect carbon accounting system, the immediacy of the climate emergency requires that action be taken now, even if it is based on less than perfect information. If we wait additional years or decades for the necessary research to be conducted and completed, the opportunities for taking action will have been lost or delayed. Such delay is irresponsible and not warranted by our current state of knowledge. Such plans for research are just another way of kicking the can further down the road, instead of incorporating immediate actions that can yield long-term benefits if implemented now. As the MA Senate stated several years ago, there is “No Time to Waste” in addressing the climate crisis. Planning additional research, while waiting to implement immediate action is simply wasting time. While it may take

some time to fully develop a carbon accounting system and a robust market framework for carbon credits, there are numerous existing models and programs that can be adopted or modified at once. While additional research and studies are always needed, they should not be used as an excuse to avoid taking action until someday in the future. The 2030 CECP should provide an action plan that can be implemented now, instead of wasting time and deferring action.

Recommendation: Immediately conduct a full carbon inventory of all Commonwealth controlled lands (Public Lands), even if the available accounting systems are not yet perfected. Put in place a carbon accounting system for private lands that will enable the aggregation of forested lands into financially viable carbon credit projects. This aggregation can be done through the Regional Planning Agencies working with the local Land Trusts. Revisions to Chapter 61 may be necessary to remove tax incentives that perpetuate the degradation of forest carbon stocks, and instead incentivize the storage of carbon through the implementation of “Chapter 61C” legislation that increases the enrollment period to 20-years so that such lands will qualify for existing Voluntary Carbon Credit Market programs, thus providing both a tax incentive and a small financial return which will likely increase the acreage being enrolled in such programs. Aiming to develop a framework by 2025 is completely unacceptable. The Plan must be revised in order to provide concrete actions that can be taken now, instead of waiting until half of the planning period has elapsed. While a multi-state effort is laudable, the Commonwealth needs to show leadership so that other neighboring states can use our efforts as a model for the eventual development of a regional framework design. Any membership for a Carbon Sequestration Taskforce should include representatives from the public and the numerous climate action groups that are working within the Commonwealth.

The modeling used in the 2050 Roadmap assumes a GHG emissions value of zero for biogenic fuels, including wood wastes. Such an assumption is not compatible with the science on biogenic carbon accounting and is bound to skew modeled results to a more favorable assessment of biogenic fuels than is actually justified. As the inefficiency of bioenergy is a simple function of physical qualities such as fuel energy density and moisture, there is no basis for assuming that these factors will be mitigated by improvements in technology. We recommend that Massachusetts not assume any biogenic feedstock is “zero emission” or “net zero,” especially with regard to woody biomass and residues. The Carbon Sequestration Task Force should assist MassDEP in the efforts to update the statewide biogenic emissions inventory, to make sure that the treatment of biogenic emissions conforms to the current scientific consensus on carbon accounting.

We appreciate the opportunity to provide these comments on the Interim 2030 Clean Energy and Climate Plan, including addressing some of the shortcomings of the underlying 2050 Decarbonization Roadmap. If you have any questions about the contents of this letter, please don’t hesitate to contact our office.

Sincerely,

Glen Ayers, Environmental Science and Public Health Advisor  
[g.ayers@pfpi.net](mailto:g.ayers@pfpi.net)

Laura Haight, U.S. Policy Director  
[lhaight@pfpi.net](mailto:lhaight@pfpi.net)

## Comments for Clean Energy and Climate Plan 2030

From Regenerative Farming, Forests and Food Systems working group of CAN, Western MA

### Building and Heating Sector

- **Recommendation:** Ensure that woody biomass is specifically excluded from any category of sustainable, cost-effective clean energy, including biofuels (i.e., p. 33, 4<sup>th</sup> bullet). Woody biomass burning and trash burning should be removed from the APS and the RPS.
  - Details: Biomass is neither clean nor sustainable, negatively impacts human health and is inconsistent with Net Zero by 2050 and 45% reduction in greenhouse gas (GHG) emissions by 2030.<sup>1,2</sup> Subsidizing these carbon emitting fuels is in direct opposition to the goals of the Massachusetts Global Warming Solutions Act (GWSA) to reduce carbon emissions,<sup>3</sup> and the Intergovernmental Panel on Climate Change.<sup>4</sup>
  - The CECP report itself recognizes that 100% of carbon contained in wood is released into the atmosphere when it is burned (See Strategy L3, p. 51)
    - Forest regrowth and carbon-debt payback is uncertain and takes many decades to a century or more
    - Climate damage is not reversed even if the forest eventually regrows

### Energy Sector

- **Recommendation:** Ensure that NO forests, wetlands and other carbon-rich lands and soils will be utilized for purposes of solar installations. (pp. 41-42)
  - Details: Solar panels must be sited on rooftops, capped landfills, parking lots, “grey fields” and other already-developed areas, not on Massachusetts’ natural carbon sinks: forests, wetlands, and grasslands. If the Commonwealth destroys these natural carbon sinks for solar development, not only will these existing natural sources of carbon drawdown and sequestration be lost, but the carbon stored in them will be released into the atmosphere, exacerbating the climate crisis. Furthermore, if left undisturbed, these natural living systems would draw down and store increasing amounts of carbon over the years.

### Natural and Working Lands Sector

- **Recommendation:** Include regenerative practices that maximize healthy soils’ ability to mitigate climate change and effectively drawdown and sequester carbon as an integral part of the CECP.

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<sup>1</sup> Mary S. Booth, Brendan Mackey, and Virginia Young, “It’s Time to Stop Pretending Burning Forest Biomass Is Carbon Neutral,” *GCB Bioenergy* 12, no. 12 (December 1, 2020): 1036–37, <https://doi.org/10.1111/gcbb.12716>.

<sup>2</sup> Mary Booth, *Paying to Cut and Burn Forests: Is This Really What We Want for Renewable Energy?*, Protecting Massachusetts Forests, 2020, <https://www.youtube.com/watch?v=XcZWTjj7yUs>.

<sup>3</sup> Massachusetts Department of Environmental Protection, “Global Warming Solutions Act,” n.d.

<sup>4</sup> Intergovernmental Panel on Climate Change, “Global Warming of 1.5 °C,” n.d., <https://www.ipcc.ch/sr15/>.

- **Recommendation:** Support funding and education for restoring ecosystems and opportunities to increase photosynthetic activity and community engagement wherever possible, such as urban, community and school gardens.
  - Details: The CECP barely mentions the critical role healthy ecosystems and regenerative land management, such as in agriculture, landscape management, lawns and gardens etc., play in stabilizing the climate.
  - Urban and community eco/regenerative farms and gardens help address not only the climate catastrophe but the contributing and related crisis such as land degradation, chemical toxicity, environmental justice communities' food justice, food and soil sovereignty, public health; physical and mental, economic injustice.
  - Photosynthesis and healthy living soil impacts the carbon and water cycles which when out of balance leads to climate derangement, flooding, droughts, fires and temperature extremes.<sup>5</sup>
  
- **Recommendation:** Support, incentivise and enforce mass-scale healthy, aerobic composting programs across the Commonwealth in which every individual can participate.
  - Details: Decomposing food waste in anaerobic conditions, as is typical when food waste is dumped into landfills, releases methane, a potent greenhouse gas.<sup>6</sup> Community-based managed composting in aerobic conditions can help to mitigate this problem, particularly in urban areas.
  
- **Recommendation:** Institute policies that support a just transition to aid farmers, homeowners, landowners and land stewards to adopt regenerative, eco-agricultural practices such as ending the use of chemical fertilizers and pesticides, no-till farming, composting, use of perennial diverse cover crops, agro-forestry, and silvo-pasture.
  - Details: Conventional agricultural practices, such as tilling, leaving soil bare, use of synthetic fertilizers and chemical pesticides, etc., destroys soil structure and biology, thus compromising the soil's ability to mitigate floods and droughts and store carbon.<sup>7</sup>
  
- **Recommendation:** Ensure public lands (both state and municipal) remain intact to develop into mature, old growth forests that provide essential ecoservices.
  - Details: Consistent with the Biden Administration's executive order to protect 30% of America's land and oceans, Massachusetts should set aside and

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<sup>5</sup> United States Department of Agriculture, "A Hedge against Drought: Why Healthy Soil Is 'Water in the Bank,'" February 21, 2017, <https://www.usda.gov/media/blog/2015/05/12/hedge-against-drought-why-healthy-soil-water-bank#:~:text=%E2%80%9CWith%20better%20soil%20structure%2C%20infiltration,of%20its%20volume%20in%20water.>

<sup>6</sup> Kishneth Palaniveloo et al., "Food Waste Composting and Microbial Community Structure Profiling," *Processes* 8, no. 6 (June 1, 2020), <https://doi.org/10.3390/pr8060723>.

<sup>7</sup> Kathy Castor, "Solving the Climate Crisis : Opportunities in Agriculture : Hearing before the Select Committee on the Climate Crisis, House of Representatives, One Hundred Sixteenth Congress, First Session, Hearing Held October 30, 2019.," Pub. L. No. Serial No. 116-13, § Select Committee on the Climate Crisis (2019), <https://www.govinfo.gov/content/pkg/CHRG-116hhr39635/pdf/CHRG-116hhr39635.pdf#?>



permanently protect from logging its 610,000 acres of state-owned forests. Leaving our state lands “forever wild” (proforestation) will help preserve biodiversity, maximize carbon drawdown and storage, protect critical watershed areas, and preserve the land for public enjoyment.<sup>8</sup> Similarly, Massachusetts must also develop policies and programs to help cities and towns preserve the 300,000 acres of municipal and county forests as “forever wild.”

- **Recommendation:** Update forest management practices to reflect evolving understanding based on forest ecology versus an extraction model.
  - Details: Large diameter trees sequester and store significantly more carbon in a year than smaller trees. While large trees may comprise 3% of total tree mass of a forest, they may contain 46% of the total above-ground carbon
- **Recommendation:** Establish and enforce oversight and evaluation of all forest management projects
- **Recommendation:** Transition to and teach a philosophy of minimal logging rather than “forest management” as it is currently practiced.
  - Details: This pertains to privately-owned lands and the Private Lands Forestry Program in the Department of Conservation and Recreation as well as public lands.
  - The CECP report notes that “*ensuring the continued health and viability of Massachusetts’ existing 3.3 million acres of forested land is the primary strategy to ensure this valuable sequestration potential is available in 2050 and beyond.*” (p. 49). Currently used “sustainable” management practices clearcut and fragment forests in the name of promoting forest health by removing infected and diseased trees, promoting successional habitat, bird habitats, increasing fire resistance, etc.<sup>9</sup> This actually destroys ecosystem health and weakens the potential of our woodlands to sequester carbon and provide ecoservices, such as clean water, clean air and wildlife habitat.<sup>10</sup>
- **Recommendation:** Develop policies to increase incentives for private forest owners to maintain them in an undisturbed state.

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<sup>8</sup> William R. Moomaw, Susan A. Masino, and Edward K. Faison, “Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good,” *Frontiers in Forests and Global Change* 2 (2019): 27, <https://doi.org/10.3389/ffgc.2019.00027>.

<sup>9</sup> Michael Kellett and Bill Stubblefield, *Our Massachusetts Forests: To Cut or Not to Cut*, Forest Speakers Series, 2020, <https://www.youtube.com/watch?v=cuaJB7rRjhs>.

<sup>10</sup> Foster David R. et al., “Wildlife Dynamics in the Changing New England Landscape,” *Journal of Biogeography* 29, no. 10/11 (October 1, 2002): 1337–57.

- **Recommendation:** Place a moratorium on logging (forest management) on public lands (state and municipal) until research on the impact of such practices on carbon sequestration and environmental impact is complete (p. 51)
  - Details: Climate Action Now, Western MA commends EEA for its commitment to *“commission additional forest carbon sequestration research, building upon the land use analysis in the 2050 Roadmap, to assess the long-term impacts of sustainable forest management practices”* (p. 50). A moratorium on state-sponsored logging as it is currently practiced until such research is completed will allow for Forestry Best Management Practices to be updated according to principles of present-day climate and environmental science.
  
- **Recommendation:** Prioritize a just transition for people whose livelihoods depend on logging, including retraining and education based on evolving knowledge of forest ecology.
  
- **Recommendation:** Prioritize and incentivize conservation in building practices to minimize the use of forests for wood products.
  - Details: Although there will continue to be a demand for wood as a building material, the Commonwealth must incentivize conservation if we are to reduce emissions quickly and drastically enough to avert climate catastrophe. When a tree is cut for wood much of the carbon is released into the atmosphere in a relatively short time. If left to grow, a tree can store carbon for hundreds of years; few buildings last that long.



March 22, 2021

Commonwealth of Massachusetts  
Office of Energy and Environmental Affairs  
100 Cambridge Street, #900  
Boston, MA 02114

VIA EMAIL: [gwsa@mass.gov](mailto:gwsa@mass.gov)

Dear Secretary Theoharides and Decarbonization Team:

We would like to begin by thanking everyone who contributed to the 2050 Roadmap and the CECP. We appreciate the vast amount of work that has gone into this critical project. As invested members of a complex society facing enormous challenges, we value this opportunity to contribute, even at this late stage, to the thinking needed for the survival and thriving of all inhabitants of Massachusetts, and to the articulation of our common values that must guide all policy.

To the degree possible, our comments are listed categorically in correlation to the sections of the CECP, for ease of review.

**1.4 A New Goal: 45% in 2030.** We support a 50% carbon emissions reduction target for 2030, in accordance with senate bill S.9. We view this target as feasible, affordable and necessary. The Governor's concerns about the difference in cost between 45% and 50% do not convince us otherwise. The cost of doing less will certainly be greater, in terms of both economics and life in general.

**1.5 Policy Analysis Process.** Core values are at stake. Values about how we interact with one another and with the environment upon which we all depend. This cannot be left to a panel of "experts" to decide. Roadmap 2050 is based on the goals of "stakeholders" which turn out to be financial interests that benefit from the current economy and are therefore resistant to the deep changes required to create a replacement economy more in sync with the natural world. Where we need bold goals and concerted action, we find only piecemeal incrementalism in an effort to preserve business as usual.

**Social Cost of Carbon.** Conspicuous by its absence is any reference to the Social Cost of Carbon (SCC), which provides an expert estimate of the societal cost of adding one metric ton of CO<sub>2</sub> to the atmosphere. The SCC has become a standard component of most recent efforts to develop science-based policy to address the global climate crisis. Based on the best available science and economics, the SCC gives the estimated monetary value of the social harms incurred by adding a given amount of CO<sub>2</sub> to the

atmosphere. The recent Technical Support Document<sup>1</sup> by the US Interagency Working Group ably discusses the basis of the federal SCC estimate and the need for further refinements going forward. Recently, there has been a growing awareness that earlier estimates of the SCC were much too low. The emerging consensus is that the SCC should be more than \$100. New York state recently adopted a figure of \$125, and qualified opinion<sup>2</sup> increasingly expects that the revised US SCC, due January 2022, will be similar or even larger. This is almost two and a half times the interim value adopted by the Biden administration, and significantly increases the value of investing today to prevent climate harm in the future. The SCC has become an invaluable tool in policy making by allowing meaningful comparisons of different policy options, and its complete absence from the 2050 Roadmap process and the current CECP 2030 is disturbing, to say the least. On the other hand, it is refreshing to see that the climate change bill (S.9) embraces the social value of carbon in the context of environmental justice concerns.

As an example of how the SCC could inform climate policy in the Commonwealth, consider the potential value of keeping our state-owned forests intact to encourage maximum carbon sequestration. Estimates of the additional carbon sequestered in our forest range between 1 and 1.5 metric tons of carbon per hectare per year (and thus, 3.67 to 5.51 tCO<sub>2</sub>eq/ha/yr) according to the Roadmap 2050<sup>3</sup>. Since our state-owned forests cover some 214,000 hectares, we calculate that they can be expected to sequester between 214,000 to 321,000 tC/yr (or 785,380 to 1,178,070 tCO<sub>2</sub>eq/yr), which would save the Commonwealth between \$98 million and \$147 million each year (using SCC = \$125) by simply leaving them alone to get on with the job. Between 2020 and 2050, this would come to between \$2.9 billion and \$4.4 billion, and all this with no additional draw on the public purse. Moreover, carbon sequestration is only one of a number of co-benefits that would accrue by leaving the forests alone and thereby making the overall social value of forest protection even higher. Failure to include SCC calculations in the land sector analysis is an example of policy negligence that should be immediately corrected.

More broadly, available SCC estimates favor significant investments in climate mitigation today in order to avoid climate harm in the future. The roughly 71 MMTCO<sub>2</sub>eq emitted by our state in 2020 incurred a social cost of almost \$9 billion, and that figure increases dramatically each year we postpone action. We are clearly investing far too little rather than any too much.

### **A Flawed Public Participation Process.**

We are further dismayed by the way in which the public participation process has unfolded. When the public meetings to launch this process were postponed on January 28, 2021, with only two minutes' advance notice, Wendell State Forest Alliance (WSFA) responded immediately to ask that the deadline for comments be extended in relation to the rescheduled webinars. Instead, the deadline was extended without the guiding presentations to help us sort through a complex document. We waited over a month with no word on their rescheduling. Two days after WSFA inquired again on March 1, new dates were finally announced, but our request that the deadline be shifted relative to the timing of the webinars was never responded to at all. We were then informed that there would be no Q&A opportunity (which was not the case originally). We have attempted to work around this problem by emailing questions, but have still not received useful answers to our questions. We object to this failure to facilitate our involvement and to the one-week turnaround interval between webinar and deadline.

In regards to the Roadmap study, we would like to know the reason why our tax dollars were spent to produce pre-weighted comparisons that disregard the best management practice available in terms of carbon benefits. It cannot be unintentional, as WSFA brought the idea of Proforestation and a selection of supporting literature to the attention of the EEA's Head of Land Use Policy in November of 2019, and to

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<sup>1</sup> Interagency Working Group on Social Cost of Greenhouse Gases, US Govt. 2021. Technical support document: Social cost of carbon, methane, and nitrous oxide interim estimates under Executive Order 13990.

<sup>2</sup> Voosen, P. 2021. Trump downplayed the cost of carbon. That's about to change. *Science* 371: 447-448

<sup>3</sup> Land Sector Report, p. 8

the Decarbonization Team at the Roadmap public meeting in February of 2020. On both occasions, WSFA requested that a Proforestation approach be incorporated as an alternative land use scenario, and was assured that the study would indeed “include a no-cut option.” This did not happen.

**B3 Strategy Actions: Clean Heat.** Establishing state policy to increase the burning of woody biomass for heating is not a viable alternative, because it burns dirtier than coal and emits much more carbon than any fossil fuel. (See section E3 for details.)

**4.2 Getting to 45% in 2030: > 4.2 MMTCO<sub>2</sub>e Reduction: 1 GW of new transmission to Quebec; E1 Strategy Actions: ...clean hydropower via a new high-voltage transmission line.**

Hydro Quebec and megadams generally are erroneously categorized as “clean energy.” We would like to see proper analysis of carbon and methane emissions throughout the flood zone. Furthermore, it must be emphasized that Hydro Quebec has and continues to pollute the water, including the release of mercury from flooded land, and to deprive this region’s First Peoples of their traditional sustenance, cultural identity and land use.<sup>4</sup> These include Abenaki, Anishinaagbe, Atikamekw, Cree, Malecite, Mi’kmaq, Innue, Naskapi, Iroquoian, Wendats and Haudenosaunee. Finally, the construction of new transmission lines to bring increased Hydro Quebec electricity to Massachusetts would involve massive deforestation and carbon release. We do not support the import of energy from this source, and must object to the proposed increase.

**E3 Strategy Actions: Review of current attribute markets to ensure those programs continue to support “on pace” clean energy deployment in a strategic, cost effective way.** Per unit of energy produced, power plants using forest biomass for fuel emit 300-400% more CO<sub>2</sub> than fracked gas<sup>5</sup>. Supplying such a dirty source to our grid is contrary to the goals of the Global Warming Solutions Act. We are doing worse than that now, by exporting woody biomass from our state forests. In fact, 50% of the trees cut down in our state forests face rapid incineration in hungry power plants<sup>6</sup>. There is no place for such a practice in these times. What belongs in any Clean Energy and Climate Plan is an absolute end to using forest biomass as an industrial fuel.

**Chapter 6.1. Protecting our Natural and Working Lands: Forest Carbon.** The CECP states as a fact that, “The 2050 Roadmap determined that Massachusetts forests have the capacity to sequester about 5 MMTCO<sub>2</sub>e per year from now through 2050.” This is a misleading figure that ignores the very Roadmap study foundational to the plan, which determined that our forests currently have the capacity to sequester “between 5 and 9.2 MMTCO<sub>2</sub>e” (emphasis added). At the upper end of this range, the figure EEA chooses as absolute is nearly doubled. Why is this being done? Theoretically, estimating high would facilitate at least on paper that net zero is more attainable. The EEA might answer that they are being conservative in order to put pressure on the state to dig deeper for emissions reductions, but that seems unlikely, since it is stated that we cannot meet our own goals without relying heavily on other regions to sell us their carbon credits.

A hint as to “why” may be found in the discrepancy between science-based estimates of our forests’ storage capacity and the CECP. The Roadmap study shows that our forests’ carbon stock growth potential is 49% by 2050, but the preselected conditions by the EEA for scenario-building result in significantly lower figures ranging from 36-39%. This difference indicates that the state never intended to consider maximizing the carbon benefits that our forests can provide. The Decarbonization Team did not have the Cadmus group develop a “no-cut” scenario, even after assuring WSFA that they would. Instead, the office had the Roadmap built to show four land use scenarios that yielded overall similar results and robbed us of the realization of 13% more carbon storage. The foregone conclusion is that,

<sup>4</sup> <https://www.sierraclub.org/press-releases/2019/11/massachusetts-events-cover-impacts-canadian-hydropower-environment>

<sup>5</sup> [https://www.pfpi.net/wp-content/uploads/2011/04/PFPI-biomass-carbon-accounting-overview\\_April.pdf](https://www.pfpi.net/wp-content/uploads/2011/04/PFPI-biomass-carbon-accounting-overview_April.pdf)

<sup>6</sup> WSFA obtained this information from a public-records request to DCR.

over the next thirty years, we will lose 3 to 4.5 times more live tree carbon from harvest than from land use change due to development.<sup>7</sup> This is irresponsible manipulation of science-based analysis which is leading to faulty policymaking where the stakes could not be higher.

**L1. Strategy Actions: *Protection and restoration of wetlands.*** As with forests, it is more important to protect existing wetlands than to plan on their destruction and restoration. However, we recognize that our coastal wetlands are already foreseeably jeopardized by ocean level rise; the same forces will challenge our ability to restore them. Site specific, scientific analysis should be done to determine whether there are viable solutions that actually benefit the climate. Wetlands and forests together comprise the bulk of our carbon stores, so we are glad to see the EEA taking them into consideration.

***No net loss of forest and farmland.*** The Resilient Lands Initiative calls for “No Net Loss” of farms and forests. We caution against simplistic thinking in this regard. “Keeping forests as forests” is not good enough,<sup>8</sup> because not all forests are equal. Comparing a broad range of forest management approaches with a range of harvesting frequency, Nunnery & Keeton of UVM found that “even with consideration of C sequestered in harvested wood products, unmanaged northern hardwood forests will sequester 39 to 118% more C than any of the active management options evaluated.”<sup>9</sup> We can no longer ignore these realities for the convenience of land use planning and resource extraction and consumption.

**L2. Strategy Actions: *Best Management Practices.*** Today’s Best Management Practices (“BMPs”) must center on surviving climate disruption. The outdated notion that “sustainable yield” forestry provides the greatest public good over the long-term must be re-evaluated. We do not suggest the complete elimination of wood products, but we must face up to the reality that their production *directly impinges upon* all the other benefits our forests provide. Therefore, prioritization is called for. Allowing optimal forest carbon benefits of both storage and sequestration, which are immediately available through a simple hands-off approach, must be considered priority number one in these times of climate emergency.

Sadly, the guiding document for BMPs, which has not been updated in nearly a decade, mentions carbon benefits only once, in its opening paragraph, and promptly dismisses the implied need with the fallacious claim that “sustainable forestry” will take care of it. New guidelines must be written to recognize the scientific fact that the largest 1% of trees more than pull their weight by storing approximately 50% of the “above-ground live tree biomass” in a forest<sup>10</sup>. Not only do the largest trees store the most carbon, but they sequester carbon at a higher rate than smaller trees.<sup>11</sup> Land use planning and all tree harvesting incentives, whether by Chapter 61 or any other statute or policy, must be reconsidered in light of this reality, especially in view of the fact that the trees targeted by commerce are the same 1% doing the most to mitigate climate disruption. Clearly, Proforestation is by far the best terrestrial “climate solution” and the most beneficial of all BMPs.

We welcome further research; enhanced carbon accounting of the living environment is much needed. But we fear a familiar thumb on the scale with the emphasis on “sustainable forest management practices,” which have always been focused on sustaining the production of wood-products without regard for the other benefits that forests provide. We must insist on a fair process with full and careful

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<sup>7</sup> Draft Land Sector Report, p. 5. <https://www.mass.gov/doc/land-sector-technical-report/download>

<sup>8</sup> Moomaw WR, Masino SA and Faison EK (2019) Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good. *Front. For. Glob. Change* 2:27. doi: 10.3389/ffgc.2019.00027

<sup>9</sup> Nunery, J. S., and Keeton, W. S. (2010). Forest carbon storage in the northeastern United States: net effects of harvesting frequency, post-harvest retention, and wood products. *Forest Ecol. Manag.* 259, 1363–1375. doi: 10.1016/j.foreco.2009.12.029

<sup>10</sup> Lutz, J. A., Furniss, T. J., Johnson, D. J., Davies, S. J., Allen, D., Alonso, A., et al. (2018). Global importance of large-diameter trees. *Glob. Ecol. Biogeogr.* 27, 849–864. doi: 10.1111/geb.12747

<sup>11</sup> Stephenson, N., Das, A., Condit, R. et al. Rate of tree carbon accumulation increases continuously with tree size. *Nature* 507, 90–93 (2014). <https://doi.org/10.1038/nature12914>

consideration of Proforestation and a genuine recognition of the public as a stakeholder, and the opportunity for public involvement from the onset of study development.

**L3 Strategy Actions:** *Incentivize the regional use of harvested wood in long-lived products, such as CLT and wood-based building insulation.* This strategy embraces the vision of the wood-product industry to increase timber production and use lower grade wood for construction and completely ignores the critical literature on the “Myth of Substitution.”<sup>12</sup> Although some advantage may be gained by replacing even more carbon-intensive building materials with wood, this rarely occurs in practice. All too often, the use of both increases, and we end up even worse than before. As we have repeatedly emphasized, logging reduces carbon sequestration by forests. In the face of the climate emergency, we must question the value of wood-products in terms of the foregone sequestration their production requires. Rather than providing a balanced evaluation of the potential of long-lasting wood products to partially offset the emissions associated with logging, the CECP fully endorses the industry-generated and widely-marketed notion that durable wood products are an effective way to mitigate climate disruption.<sup>12, 13</sup> Furthermore, only living trees continue to capture and store carbon and do so for decades or centuries to come.

**L4 Strategy Actions:** *Support a Regional Carbon Market.* That Carbon Markets represent the optimal approach to managing the transformation to a zero-carbon world is simply assumed without any justification whatsoever. This is remarkable given the extremely uneven performance of carbon markets elsewhere. We are deeply suspicious that a global climate crisis that has been referred to as “the largest market failure in history” can be addressed by creating new markets of questionable value. This looks like another pseudo-solution dreamed up by an unhealthy collaboration between technocrats and financial stakeholders. Since we all share the same atmosphere, why not push our regional neighbors and the federal government to turn logging-vulnerable Green Mountain National Forest and White Mountain National Forest into fully protected National Parks. Together these forests comprise some 465,390 hectares yielding an annual social benefit of between \$213 million to \$320 million (or a projected \$6.4 billion to \$9.5 billion over 30 years). We suggest that taking advantage of such low-hanging fruit is vastly simpler and much more cost effective than expending time, effort, and political capital to devise necessarily complex market schemes of questionable utility.

## Conclusion

We wish to recognize the hard work of many, those who have had a hand in creation of the CECP, those who are contributing their knowledge and ideas by commenting, and the many, many others who are actively engaged in identifying and manifesting real solutions. We celebrate collaboration and hope that the EEA will work more closely with the residents of this Commonwealth, in recognition that our society reflects the values and creativity of all its people.

SIGNATURES FOLLOW ON 19 PAGES

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<sup>12</sup> Leturcq, P. 2020. GHG displacement factors of harvested wood products: the myth of substitution. *Scientific Reports* 10: 20752. <http://doi.org/10.1038/s41598-020-77527-8>

<sup>13</sup> Nunery, J. S., and Keeton, W. S. (2010). Forest carbon storage in the northeastern United States: net effects of harvesting frequency, post-harvest retention, and wood products. *Forest Ecol. Manag.* 259, 1363–1375. doi: 10.1016/j.foreco.2009.12.029

First name	Last name	Email	Address (add "0" for MA)				Comments
Wendell St	Forest Alliance	wendellstateforest@gmail.com	--	MA	1301	US	
Gia	Neswald		Greenfield	MA	1301	US	Thank you!
Priscilla	Lynch		Conway	MA	1341	US	
Jodi	Rodar		Amherst	MA	1002	US	
	Hines		Wendell	MA	1379	US	Please embrace this urgency,ô°
Josiah	Bouricius		Montague	MA	1351	US	
Darcy	Sweeney		Florence	MA	1062	US	
Amy	Newland		Royalston	MA	1368	US	
Christopher	Queen		Wendell	MA	1379	US	It is essential that Massachusetts lead the way in protecting our shrinking forests, our last best hope of mitigating climate change through natural means. Continuing to pander to the logging industry is dishonest and dangerous.
Jean	Barrows		Greenfield	MA	1301	US	We need to keep our forests standing! Not only to sequester carbon but also to keep us sane. Two things necessary for homo sapiens to continue on this planet!!
Meg	Sheehan		Plymouth	MA	2360	US	In addition to these comments, the Community Land & Water Coalition of Southeastern Massachusetts demands that the CECL remove subsidies for land based solar projects. The Governor's solar subsidies are destroying forests and biodiversity and threatening our water supply. Stop the SMART program subsidies and all subsidies for land based solar!
Laurel	Facey		Montague Town of	MA	1349	US	
Carol	Lewis		Amherst Town of	MA	1002	US	
William	Facey		Montague Town of	MA	1349	US	
Don	Ogden		Florence	MA	1062	US	CECP for 2030 should include a halt to commercial logging on public lands and an end to clearing intact forests for solar grids.
Mary	Thomas		Wendell	MA	13790 994	US	Western Mass has the most carbon dense forest in the US. Forests such as the Amazon are now adding to atmospheric carbon, making it even more vital for us to preserve OUR forests. We owe it to the world, to other species and to future generations to save these mighty climate-crisis



							fighters from resource extraction. Our voices and our votes represent those who can't speak or vote for themselves.
Michael	Dover		Leverett	MA	1054	US	
Sarah	Soffer		Hinsdale	MA	1235	US	
Jehann	El-Bisi		Sunderland	MA	1375	US	Anyone not accepting trees, forests, mycelium as integral and critical to our collective survival is living in the dark ages, with zero foresight or vision or protective instincts one might cultivate to save their child. In this case, we must protect our Mother, the trees her lungs and ours. Wake up.
Rem	Boscov		Leverett	MA	1054	US	
Besse	Lynch		Conway	MA	1341	US	
Joslin	Stevens		Wendell	MA	1379	US	
							Enough is enough. To Baker, and Theoharides: Stop putting timber industry profit before the survival of the planet. This is ecocide, and a violation of your sworn oath of office, and to the public trust, to serve the best interests of the People of the Commonwealth, and no one else. You are in serious violation of Article 7 of the Declaration of Rights of the Massachusetts Constitution, drafted by John Adams himself: "Government is instituted for the common good; for the protection, safety, prosperity and happiness of the people; and not for the profit, honor, or private interest of any one man, family, or class of men". We are watching. Is impeachment the only way to get you to do your duty to the people and the planet? #badfaithoathoffice. These trees belong to the public, and you are allowing the private timber industry to raid our public forest natural assets (the only thing that can reverse climate change in the 10 years we have left), and losing money while betraying the future of the planet. This goes beyond malfeasance. Baker was purchased for 18 million dollars by the Commonwealth Future Independent Expenditures Fund (financed wholly by the Republican Governors Association). He represents corporate interests, supplanting the People of the Commonwealth and his oath of office to do so. SHAME ON YOU.
Lisa	Hoag		Wendell	MA	1379	US	
Chris	Matera		Northampton	MA	1060	US	
Ellen	Hopman		Belchertown Town of	MA	1007	US	Trees are still the best solution to global warming. The older they are the more carbon they hold. LET THEM LIVE!!!
Joan	Levy		Amherst Town of	MA	1002	US	

Mary Jane	Else		South Hadley	MA	1075	US	Cutting trees and burning them is not a climate-friendly method of getting electrical power.
Stephanie Jo	Kent		Belchertown Town of	MA	1007	US	Stop selling forests! All the jobs can be repurposed, and the income is negligible to the state, and comes with far too many built-in costs. The private businesses raking in the big bucks need to be encouraged to retool and extend into other areas that do not harm intact living carbon-sequestering beautiful old growth forests.
paki	wieland		Greenfield	MA	01301-2959	US	
Jo	Kent		Belchertown Town of	MA	1007	US	
Leonore	Alaniz		Turners Falls	MA	1376	US	
Susan	Purser		Becket	MA	1223	US	
Adrienne	Tedeschi		Holbrook	MA	2343	US	
Trish	Gallagher		Dorchester Center	MA	2124	US	
John	Galt		Pittsfield	MA	1201	US	
Melissa	Ludtke		Cambridge	MA	2140	US	Wholeheartedly affirm my support for the proposals in this letter.
Rema	Loeb		Plainfield	MA	01070-9775	US	If EEA does still not understand, I ask them to please read the IPCC. There is no excuse for ignorance at this critical time.
Karen	Fogliatti		Greenfield	MA	1301	US	
Betsy	Browning		Colrain	MA	1340	US	Gov Baker...please sign to protect the future of Massachusetts for our children and grandchildren
Heather	Marderosian		North Attleboro	MA	2760	US	We value the state forests in Massachusetts personally I use them all the time....We do not want fossil fuel contaminations in our forest Massachusetts has already been taking advantage of through the industrial age and military industry which is contaminated many of our waterways we can't afford anymore...green energy please.
shay	cooper		Wendell Depot	MA	1380	US	WE had better make changes to save the forest rather than barter them for a few pennies.
Aaron	Banville		Greenfield	MA	1301	US	The EEA's deceit is a form of abuse. Not cool.
Deborah	Andrew		Shelburne Falls	MA	1370	US	There is an absence of critical, deep, and arms length analysis of the harms caused by 'renewables,' endless growth of the economy, the pentagon/military, factory farming, so-called 'forest management.' This absence, especially within the public discourse and media coupled

							with monied interests that govern legislation and parameters of public discourse have led to a singular lack of appreciation for the role of forests, fields, the natural landscape in having made the planet habitable. The continued absence of this understanding is a large factor in the willingness of those with legislative power to de-value forests such as the Wendell State Forest. To preserve the planet this must change radically.
Grace	Fitzpatrick		Easthampton	MA	1027	US	
Deb	Friedmab		Easthampton	MA	1027	US	
Paul	Richmond		Wendell	MA	1379	US	We need to keep forest especially older forest and there are many other alternatives for the products we get from wood that are more sustainable and better for the planet
Mary Lou	Conca		Shutesbury	MA	1072	US	Trees are the best technology for Co2 control.
Delta	Carney		Ashfield	MA	1330	US	
Reed	Schimmelfing		Northampton	MA	1060	US	
Martin	Kent		Belchertown Town of	MA	1007	US	
Wendryn	Case		Chicopee	MA	1020	US	Biomass is NOT clean energy. My communities of Springfield and Chicopee don't need any more pollution that increases our asthma rates.
Robert	Perry		Dudley	MA	1571	US	
Robert	Perry		Dudley	MA	1571	US	
Christina	Marks		Williamstown	MA	1267	US	This is not heating a room or a home with a wood stove. This is massive profit-producing for energy companies who suck public lands, and our atmosphere dry. It's disgusting abuse of power. You may not ethically cut down our forests in Mass to benefit companies in which I daresay you own stock, pretending it is good. Criminal! For shame!
Sevina	Ospina		Westminster Town of	MA	1473	US	
Christine	Copeland		Northfield	MA	1360	US	
Wanita	Sears		Wendell	MA	1379	US	
Mary	Murphy		Northampton	MA	1060	US	
Erica	Ferencik		Framingham	MA	1701	US	
karen	nylander		Amherst Town of	MA	1002	US	This is a serious and sober letter --- our forests need to be saved to save life on the planet and us . With all due respect to technical language, the forests provide homes and healing to the

							creatures of the earth. They refresh and clean the atmosphere, the environment. They provide poetry to the soul. They will not come again. We must save our trees, our forests.
Idelisse	Martinez		Florence	MA	1062	US	
Stephanie	Davolos		Florence	MA	1062	US	
Lenore	Bryck		Amherst Town of	MA	1002	US	
John	Cohen		Northampton	MA	1060	US	
Alexander	Province		Greenfield	MA	1301	US	Please respect the voices of the People!
Elizabeth	Neuman		Clinton Town of	MA	1510	US	Forests are the lungs of the planet. It is crucial that we respect the lungs of our planet. They are our lungs as well.
Tina	Croteau		West Townsend	MA	1474	US	
Kristen	Endrizzi		Dorchester Center	MA	2124	US	
Dericka	Eppelsheimer		Bedford	MA	1730	US	
Saralinda	Lobrose		Plainfield	MA	1070	US	Forests are critical to efforts to stop climate change!
John	Gurvitch		Holyoke	MA	1040	US	
Ramona	Hamblin		Orange	MA	1364	US	Please include forests in the climate Bill. They are havens for life.
Jonathan	Schwartz		Shutesbury	MA	1072	US	
Linda	Coffey		Belchertown Town of	MA	1007	US	
Anjulie	Greenman		Worcester	MA	1602	US	
Lynne	Spichiger		Belchertown Town of	MA	1007	US	
Patrick	Pezzati		Montague	MA	1351	US	
Amanda	Nash		Gloucester	MA	1930	US	
Mary	Newland		Monson	MA	1057	US	I support "proforestation". We own forest property which was hit hard by the gypsy moth epidemic. We decided to allow the affected trees to gradually rot and fall to the forest floor (sequestering carbon) rather than have loggers come in and destroy our beautiful land. We are deeply concerned about climate change and realize that drastic measures must be taken to protect our planet.
Dale	LaBonte		Northampton	MA	1060	US	

joanna	wilson		Florence	MA	1062	US	We need every single tree ?
Russell	deLucia		Cambridge	MA	2139	US	
HARVEY	RIVARD		Montague	MA	1351	US	I like breathing I want my grandchildren and their grandchildren to also enjoy breathing
Christa	Whitney		Northampton	MA	1060	US	Protecting mature forests isn't integral to a comprehensive climate plan!
Christa	Whitney		Northampton	MA	1060	US	Protecting mature forests is integral to a comprehensive climate plan!
Lonnie	Chu		Easthampton	MA	1027	US	
Roberta	Issler		Northampton	MA	1060	US	
Dorothy	McIver		Greenfield	MA	01301-1511	US	
Harry	Newell		Maynard	MA	1754	US	
Kristine	Jelstrup		Cambridge	MA	2139	US	
Maiyim	Baron		Brookline	MA	2446	US	
Quentin	Davis		Jamaica Plain	MA	2130	US	To embrace clean energy and protect the environment, it is essential to preserve mature forests to mitigate harmful effects of climate disruption.
James	Thornley		Wendell	MA	1379	US	I support this fully.
J. William	Stubblefield		Wendell	MA	1379	US	
Kimberly	Lenz		Wendell	MA	1379	US	
John	Heffernan		Conway	MA	1341	US	
Ellie	Goldberg		Newton Center	MA	02459-1137	US	
Deborah	Reiter		Amherst	MA	1004	US	
Kelly	Cusson		Pittsfield	MA	1201	US	
Bonnie	Gorman		Quincy	MA	2169	US	
Stephanie	Blumenthal		Sheffield	MA	1257	US	
Alden	Booth		Gill	MA	1354	US	This letter reflects a tremendous amount of good thought and research especially around the need to include the Social Costs in analyzing the value of carbon removal. As a business owner and resident in Massachusetts I fully support the arguments in this letter.
Al	Blake		Becket	MA	1223	US	

Suzanne	Durand		Gilbertville	MA	1031	US	I applaud all the hard work of everyone to save our forests .
Sarah	Stewart		Watertown	MA	2472	US	
Deborah	Andrew		Shelburne Falls	MA	1370	US	To ignore the depth of research and analysis this letter provides would be a major error. Much is at stake. The public counts on the Office of Energy & EEA to adopt policies and legislation that reflect arms-length scientifically based analysis that protects the environment, our state and the planet.
Susan	Worgaftik		Greenfield	MA	1301	US	
Susan	Worgaftik		Greenfield	MA	1301	US	
walter and susan	cudnohufsky		Ashfield	MA	1330	US	
Ellen	Moyer		Westfield	MA	1085	US	
Jonathan	von Ranson		Wendell	MA	1379	US	
Mona	O'Dowd		West Hatfield	MA	1088	US	
Ziporah	Hildebrandt		Shutesbury	MA	1072	US	Outrageous that intact forests are not given their true value in this proposed legislation! Mass is wealthy in trees worth more alive than burned or turned into paper or furniture.
Louise	Amyot		Greenfield	MA	1301	US	Biomass is NOT clean energy! The carbon and particulates that are released by burning wood are among the most egregious air polluters that exist. The additional act of cutting down the most efficient removers of carbon from the atmosphere in order to collect this fuel is an insult to the science and the health of the planet and all its inhabitants! IF the EEA is serious in ensuring clean energy for Massachusetts, the organization will NOT sign on to this act as it stands. REMOVE WOOD FROM THE RENEWABLE ENERGY LIST FIRST!
Pam	Tinto		Amherst Town of	MA	1002	US	
Graeme	Sephton		Shutesbury	MA	1072	US	
Paul	Lauenstein		Sharon	MA	2067	US	With CO2 well above the maximum safe level of 350 ppm and rising fast, we are already in the "red zone." We need every tree we can save to remove CO2 from the atmosphere.
Janice	Higgins		Hadley	MA	1035	US	Save our forests and the web of life they support!
Frank	Mand		Plymouth	MA	2360	US	Subsidies for solar that allow large-scale arrays to be installed on forested land are damaging, not improving, our climate resiliency, damaging biodiversity, endangering wildlife.

Gail	Fries		Northampton	MA	1053	US	
Cynthia	Lawton-Singer		Conway	MA	1341	US	The value of our living forests to ourselves and future generations is hundreds of times the value of lumber, wood pellets or any product, including electricity or heat, that could be made from our living forests if we destroy them by cutting them.
Albert	Navitski		West Brookfield	MA	1585	US	We must preserve our forests. This is a crucial and efficient way to sequester carbon - something that is necessary for the survival of our planet. I stand firmly against the section of the Clean Energy and Climate Plan that might result in the destruction of our forests. Instead we must protect our forests as a way of reaching our carbon reduction goals.
Alan	Papscun		Stockbridge Town of	MA	1262	US	Clean energy now! no burning of woodlands!
Sarah	Heller		Brookfield	MA	1506	US	Please carefully review the Wendell State Forest Alliance comments. I especially highlight two aspects: (1) The need to include SCC calculations in the land sector analysis, and (2) MA-owned forests need to be left alone and intact to encourage maximum carbon sequestration. Thank you.
FITZGERALD	PUCCI		North Brookfield Town of	MA	1535	US	I cannot imagine a New England nor a Massachusetts that survives the coming onslaughts of the climate crisis without its robust and healthy forests. Our forests and trees are literally one of the biggest safety nets against temperature increase. They make our air healthier, our climates cooler, and stabilize the ecosystem we are in. These forests are the front line anchors of our resilient ecosystem, and any challenge to this needs to be met with a swift and decisive rebuke.  Will we be able to make the transition to renewable energy, develop strong electric public transit throughout Western, Central, and Eastern Massachusetts? Yes!! Clean energy infrastructure, rural broadband availability, and carbon sequestration need to happen WITH a deliberate effort to keep our forests intact and plentiful. This is NOT a resource we can afford to let go of now.
Jo	Kent		Belchertown Town of	MA	1007	US	
Janet	Cason		Northborough	MA	1532	US	
MARIA	BARTLETT		Andover	MA	01810-2306	US	
Ronald	Cason		Northborough	MA	1532	US	

Gwenevra	Nabad		Northampton	MA	1060	US	I believe the importance of forests and old growth species forests are getting too little attention. Read the research that shows that forests are invaluable when it comes to the mental health and physical well being of humankind.
Dylan	Clark		Barre	MA	1005	US	
James	Mulloy		Salem	MA	1970	US	We need a real response to a real crisis. Business as usual is over, one way or the other. I am hopeful we can transition to a more sustainable way of living in time to minimize the amount of suffering of future generations.
Erik	Burcroff	---	Plainfield	MA	01070		
James	Vander Poel		Northborough	MA	01532	US	
Eric	Von Bleicken		West Brookfield	MA	1585	US	It is vital that our forests are protected!
Steven	Botkin		Amherst Town of	MA	1002	US	
Suzanne	Farrington		Northampton	MA	1060	US	
Becky	Ikehara		North Brookfield Town of	MA	1535	US	
Andrr	Durand		Gilbertville	MA	1031	US	
Margaret	Bullitt-Jonas		Northampton	MA	1060	US	Protecting forests is essential to enhancing carbon sequestration and mitigating climate change.
Zoe	Nagasawa		Dorchester Center	MA	2124	US	
Elissa	Bowling		Somerville	MA	2144	US	
Peggy	Matthews-Nilse n		Amherst Town of	MA	1002	US	
Sharon	Farmer		Holyoke	MA	1040	US	We must NOT define biomass as clean energy. We must NOT subsidize biomass energy plants with taxpayer money. We MUST take the health of the people of the Springfield area into consideration: Springfield is already the asthma capital of the U.S., and now there are plans to construct a biomass energy plan in East Springfield. THIS IS NOT OK!
Susan	Garrett		Hadley	MA	1035	US	
Alice	Fan		Andover	MA	1810	US	
Nancy	Tame		Spencer	MA	1562	US	You need to include the true value of forests to sequester carbon, and you need to include SCC calculations in the land sector analysis. SCC =



							Social Cost of Carbon, which provides an expert estimate of the societal cost of adding one metric ton of CO2.
Enviro	Show		Florence	MA	1062	US	Public forests are our best chance to sequester CO2 from the atmosphere. Stop logging our State forests!
Rosemary	McNaughton		Florence	MA	1062	US	
Kate	Enderlin		Salem	MA	1970	US	
Ralph	Hicks		Spencer	MA	1562	US	We need trees to breath!
Karl	Meyer		Turners Falls	MA	1376	US	New England forests are our carbon storing, oxygen producing equivalent of tropical rain forests. They should be preserved, not mined. Culling them for all available "biomass" and burning that, is just a way of starving an ecosystem of its regenerative cycle. It's like the 17th and 18th centuries when farmers continually tried to pull crops, year after year, by plowing up and planting and repeatedly harvested the same acreages--eventually impoverishing and ruining rich topsoil, and seeing that farmland abandoned in the East to exploit and ruin new, un-tilled acreage further and further West. The Dust Bowl was one grim result.
Cory	Alperstein		Newton	MA	2458	US	With the passage of the Next Gen Roadmap bill we now have legislation that spells out how we will make good on climate action - which will work in concert with the CECP for 2030. I hope the comments in this letter will be taken to heart as changes are made to the draft of the plan. The public comment process should be more than a chance for people to feel they have been heard; it should be intentional regarding changes to the plan accounting for the incredible knowledge brought forth through this comment period. Let's get serious!
denis	mahoney		Holden	MA	1520	US	
paki	wieland		Greenfield	MA	01301-2959	US	
Ken	McDonnell		Holden	MA	1520	US	
Susan	Triolo		Sunderland	MA	1375	US	The clock is ticking to save the planet and our forests.
Jess	Kenney		Northampton	MA	1060	US	
Maria	Wilkesn		Ipswich	MA	1938	US	All of us are stakeholders when it comes to climate change. To allow only those with financial interests to weigh in on the future of CECP shows both a lack of respect for our communities as well as putting doubts about how decisions are actually being made. We have very little time to prevent all out catastrophe, please allow communities the right to participate in a process that will deeply affect their lives.

Michael	Duclos		Stow	MA	01775	US	
Susan	Waltner		Goshen Town of	MA	01096	US	
Pamela	Matsuda-Dunn		Easthampton	MA	01027	US	
r	tippens		Colrain	MA	1340	US	
Barbara	Baatz		Arlington	MA	2476	US	We need to protect our forests. After all, they are alive and help us sequester carbon as well as give us clean air to breathe, just to name two priceless gifts they us.
Carole	Horowitz		Florence	MA	1062	US	
Alex	Chambers		Boylston	MA	1505	US	
Elizabeth	Greywolf		Cambridge	MA	2140	US	Commercial logging of trees - especially the largest, oldest trees in state-owned forests must stop!
Paula	Wells		North Adams	MA	1247	US	Please do not undervalue forests. They should be left intact for their ability to mitigate global climate change. They should not be logged! Listen to science.
Kenneth	KLOPFER		Longmeadow	MA	1106	US	Essential that the carbon storage benefits of our forests are protected. These lands need to support all of us and our planet, not just the commercial interests of some.
Robert	Belanger		Fiskdale	MA	1518	US	
Malcolm	McNee		Northampton	MA	1060	US	If Massachusetts is to have any standing and moral authority in advocating that other states and other countries preserve their forests for carbon capture and storage and other critical ecological functions, we must begin to seriously address those features and potentials with our own forests. We must stop incentivizing and subsidizing with taxpayer dollars the cutting of our few remaining public forests.
Amanda	Nash		Gloucester	MA	1930	US	
James	Lapierre		Cambridge	MA	02139- 2715	US	
Ginger	Ryan		Cambridge	MA	2138	US	
sandra	boston		Greenfield	MA	1301	US	trees are our allies, maybe our leaders!
Ralph	Baker		Fitchburg	MA	1420	US	While I am unsure that I fully agree with the comments made regarding Quebec hydropower, I otherwise wholeheartedly endorse this very thoughtful and well-documented set of comments.
Kirsten	Frazier		Oakham	MA	1068	US	

Albert	Navitski		West Brookfield	MA	1585	US	
Irma Lorraine	Pearson		Greenfield	MA	1301	US	
David	Gafney		Lee	MA	1238	US	
Stephen	Brody		Norwood	MA	2062	US	Forests are critical to mitigating the impacts of the Global Crises. The time to act is Now. I thoroughly support the position of the Wendell Satae Forest Alliamce.
Charles	Flammer		Lexington	MA	2421	US	To be successful in meeting the 2050 Roadmap's goal of reaching net-zero emissions, we must maximize the sequestering of carbon by forests, and therefore preserve the older trees which are most efficient at sequestering carbon.
Ruth	Parnall		Conway	MA	1341	US	
Susan	Lemont		Arlington	MA	2476	US	
Kuldeep	Singh		Upton	MA	1568	US	
Joy	Gurrie		Ipswich	MA	1938	US	
Danielle	Lamoureux-Kane		Brookfield	MA	1506	US	
denis	mahoney		Holden	MA	1520	US	
BRENDA	Kaubin		Millers Falls	MA	1347	US	
Amy	Meltzer		Cambridge	MA	02139-1103	US	Please also consider the crucial need to protect biodiversity which is endangered by the rapid rise in species extinctions. Protecting natural habitats such as forests also protects biodiversity - which is as essential to our future survival as reversing the effects of climate change.
Gail	Sandman		West Brookfield	MA	1585	US	I disagree with clear cutting the forests. They do not need this kind of management. Leave them alone.
Bob	Datz		West Brookfield	MA	01585-2812	US	
Gregg	Crawford		Greenfield	MA	1301	US	Bob Leverett and his group's research has shown the large trees sequester more CO2 than smaller trees which is a good reason to leave the forests intact and not do the clear cutting that you see in MA state forests such as Wendell St Forest.
Jasmine	Ward		Montague	MA	1351	US	
danelle	laflower		Wales	MA	1081	US	
John	Anderson		Millers Falls	MA	1347	US	
Lynne	Man		Lunenburg Town of	MA	1462	US	I fully support the Wendell State Forest Alliance's positions and comments.

Robert	Bonney		Salem	MA	1970	US	
Bette	Viano		West Roxbury	MA	2132	US	
Joseph	Stubblefield		Dunstable	MA	1827	US	
Lisa	Enzer		Montague	MA	1351	US	
John	Hondrogen		Amherst Town of	MA	1002	US	
R	tippens		Colrain	MA	1340	US	It is essential to preserve those forests that are older not only because of the greater amounts of carbon they store but because of the biodiversity of the forest floors that is grossly interrupted with cuttings!
MaryJo	Stanley		Florence	MA	1062	US	Because if human ignorance of the vital role of trees on this planet, we have been making foolish mistakes and creating abuses for thousands of years. But now the science is teaching us just how wrong we have been. Please pay attention to the science and not to the greedy ones for whom trees are an expendable "resource" to exploit for one's personal gains. The future is for all of us; stop leaving the messes for the next generations to have to clean up - or suffer from.
Gretchin	Witman		Montague	MA	1351	US	
Annita	Sawyer		Northampton	MA	1060	US	
Peter	Liberman		Hinsdale	MA	1235	US	Halting logging in all state owned land is an easy and effective way to fight global warming and to beautify Massachusetts. Please include it as a goal, or at least an option, in the EEA plan.
Sabine	von Mering		Wayland	MA	1778	US	
JOSEPH	DESALVIO		Hatfield	MA	1038	US	
Melissa	Rivard		Cambridge	MA	2139	US	We need to be radically bold and comprehensive in creating and holding ourselves accountable to a plan to save the planet from cataclysmic climate change. Thinking that we can continue on a path of constant economic growth that benefits a tiny fraction of the world's human population at the cost of all other current inhabitants of the planet is criminally reckless. Please consider these recommendations carefully and incorporate them into the final CECP. Everything depends on it.
Carol	Lewis		Amherst Town of	MA	1002	US	
Gabriel	Robinson		Cambridge	MA	2139	US	
-	Dorthee		Wendell	MA	1379	US	

Mary	Peterson		Amherst Town of	MA	1002	US	In particular, I am alarmed by any encouragement of burning biomass as a way to produce energy. As a person with asthma, I am acutely aware of how it would impact our air and our public health. I am also ready to do whatever I can to protect our forests--a resource important not only for carbon sequestration, but also for the physical, emotional and spiritual health of our people and wildlife.
E	Caurant		Northampton	MA	1060	US	
John	Schwartz		Jamaica Plain	MA	02130- 4035	US	The notion that wood burning is of clean air value is without sound scientific basis and the real facts are that it is a significant pollutant that further reduces forest incorporation of CO2
Dorothy	Anderson		North Weymouth	MA	2191	US	
Jessica	Skyleson		Rehoboth	MA	02769- 2904	US	
Stephanie	Blumenthal		Sheffield	MA	1257	US	
Holland	Hoagland		Hatfield	MA	1038	US	
Patricia	Healey		Florence	MA	1062	US	
Tibor	Tscheke		Melrose	MA	2176	US	
Gisela	Tscheke		Melrose	MA	2176	US	
Verne	McArthur		Springfield	MA	1108	US	
Peggy	Wolff		Leverett	MA	1054	US	I strongly agree with the remarks from Wendell State Forest Alliance.
Tom	Wolff		Leverett	MA	1054	US	
AE	Meblin		Greenfield	MA	1301	US	Let's finally make foresightful, science-based decisions to reverse so many of the purely short term, profit- driven past decisions.
Saralyn	Steingiser		Amherst Town of	MA	1002	US	
Donald	Walker		Conway	MA	1341	US	We need more financial assistance!
Orian	Greene		Maynard	MA	1754	US	
Betty	krikorian		Belmont	MA	2478	US	
Peter	Hudyma		Montague	MA	1351	US	
Jackie	Ballance		Florence	MA	1062	US	
John	Cohen		Northampton	MA	1060	US	

vivian	scott		Warwick	MA	1378	US	
vivian	scott		Warwick	MA	1378	US	
Alan	Field		Winchester	MA	1890	US	
John	Gittins		North Brookfield Town of	MA	1535	US	Please consider very, very seriously the need to protect all of our forests to mitigate the causes and effects of climate change. Act now. Tomorrow will be too late.
John	Varner		Amherst Town of	MA	1002	US	Forests have value above and beyond their use as an extractive resource, especially with regard to using biomass as a 'clean' or renewable energy source. Biomass is NOT a climate-friendly option.
John	Bottomley		Greenfield	MA	1301	US	
Judith	Embry		North Adams	MA	01247- 9400	US	
Bonnie	Gorman		Quincy	MA	2169	US	
Leo	Franceschi		South Deerfield	MA	1373	US	
Nathalie	Bridegam		Amherst Town of	MA	1002	US	We desperately need our forest, not just as carbon sinks and weather regulators, but also to do there incredibly important part in sustaining biodiversity.
Karen	guillette		Turners Falls	MA	1376	US	
Gwen	Blodgett		Goshen	MA	1096	US	Please delay and revise your Clean Energy and Climate Plan for 2030. The Wendell State forest Alliance has it right--Listen to them!
Tom	Amiro		Chelmsford	MA	1824	US	The only reason to cut down a tree is to enable residential solar or wind or for lumber to be used in building net neutral houses.
Sarah	Stewart		Watertown	MA	2472	US	
Aaron	Falbel		Sunderland	MA	1375	US	Secretary Theoharides: A lot of research has gone into this commentary on the CECP. I hope you take it seriously and consider the criticisms and proposals it outlines carefully. Throughout, it asks the question, "Who benefits?" I call upon you and the Decarbonization Team to ask this question as well.
Maureen	Doyle		Southbridge	MA	1550	US	
Linda	Putnam		Northampton	MA	1060	US	
michael	Kurland		Goshen Town of	MA	1096	US	

Jayme	kurland		Becket	MA	1223	US	
Laura	Williams		Sunderland	MA	1375	US	
Edith	Allison		Amherst Town of	MA	1002	US	So important to think long-term for EVERYONE,ÄS health. Thank you!
Daun	Anderson		Arlington	MA	2474	US	
Ann-Elizabeth	Barnes		Great Barrington	MA	1230	US	
Scott	Reed		Sunderland	MA	1375	US	
Rudy	Heller		Brookfield	MA	1506	US	Please listen to the Wendell State Forest Alliance. They have important points to consider. Thank you.
Kendra	Bowker		Merrimac	MA	1860	US	
Elizabeth	Sockwell		Newton Center	MA	2459	US	The EEA needs to take ACTION, not write 200+ page reports about climate change and the issue. What we need now are leaders who have visions and solutions. We need the EEA to lead us into a clean energy economy with great jobs with benefits for people here in MA! We need the EEA to step up and get real on climate. We have the potential for offshore wind, solar, geothermal, and others to get us to 100% renewable electricity by 2050, but only if this 2030 CECP is strong enough!
Vivienne	Simon		Florence	MA	1062	US	
Patricia	Greely		Holbrook	MA	2343	US	
Jenna	Chandler-Ward		Cambridge	MA	2138	US	
Ann	Rick		Northampton	MA	1060	US	Trees have great value in our world. Get educated on their immense benefit to human beings when they are not cut down, please.
Joslin	Stevens		Wendell	MA	1379	US	
Amanda	Nash		Gloucester	MA	1930	US	
Peter	Kahigian		Haverhill	MA	1832	US	
Anne	O'Connor		Williamstown	MA	1267	US	I am grateful to be able to join my name to this important and thoughtful collective comment on the CECP.
Shirley	Dufresne		Somerset	MA	2726	US	
Ruth	Flaherty		Brookline	MA	2446	US	
Patricia	Sipe		Northampton	MA	1063	US	
Deborah	Andrew		Shelburne Falls	MA	1370	US	To ignore or undervalue the contributions that our forest make when simply left to grow and mature

							would be a grave mistake, the impact would affect generations to come.
Karen	Root Watkins		Acton Town of	MA	1720	US	
Deborah	Reiter		Amherst	MA	1004	US	
Anne	O'Connor		Williamstown	MA	1267	US	I am grateful to be able to join my name to this important and thoughtful collective comment on the CECP.
Shirley	Dufresne		Somerset	MA	2726	US	
Ruth	Flaherty		Brookline	MA	2446	US	
Patricia	Sipe		Northampton	MA	1063	US	
Deborah	Andrew		Shelburne Falls	MA	1370	US	To ignore or undervalue the contributions that our forest make when simply left to grow and mature would be a grave mistake, the impact would affect generations to come.
Karen	Root Watkins		Acton Town of	MA	1720	US	
Deborah	Reiter		Amherst	MA	1004	US	
Rakelle	F		Milford	NJ	8848	US	
Donna	Yavorsky		Warren	NJ	7059	US	While I now live in NJ, I was born and brought up in Western Mass, and often visit family there. We all seriously care about this environment!
Silvia	Solaun		Sparta	NJ	7871	US	In order to effectively address climate change, Massachusetts must protect and preserve the public forests, not log them!  Please stop the logging of MA ,Àòs public forests as our our forests left intact are our best defense against climate change!
Gail	Adrian		Stockholm	NJ	7460	US	Global climate change is due in large part, to timber logging. I urge you to halt all remaining forest cuts and take into consideration, the latest studies urging LESS logging.
Audrey	Brown		Mount Ephraim	NJ	8059	US	
jacquelyn	drechsler		Valley Cottage	NY	10989	US	No Hyrdo Power Quebec. This is dirty energy that has been an continues to harm Indigenous Peoples way of life in Canada. The United States must not be complicit by getting our energy through this dirty company. During this time of global climate change, we need to be sinking our money into local ,Àúgreen,Àù jobs that empower our communities with truly clean energy, that does not harm others.



							Large scale out of state hydro does not help us. It only hurts others.
Donna	Frankel		New York	NY	10011	US	
robert	stayman		New York	NY	10025	US	
Cameron	Major		Queens Village	NY	11429	US	
John	Garrett		Syracuse	NY	13224	US	
Kay	Evans		Gardiner	NY	12525	US	There is a glaring need here to include the carbon storage value of intact maturing forests!
Andrew	Vass		Toledo	OH	43605	US	
Shannon	Felder		Philadelphia	PA	19102	US	
Richard	Metz		Cheltenham Twp	PA	19038	US	
Richard	Metz		Cheltenham Twp	PA	19038	US	
Laura	Nicol		Katy	TX	77449	US	Trees are vital to the health of our climate!
Shirley	Dufresne		Bellmead	TX	2727	US	Please protect our trees and forests.
Matt	Newman		Damascus	VA	24236	US	Stop cutting forests AND protect ALL mature trees, everywhere, as THEY are the REAL climate stabilizers.
Kenneth	Lederman		Arlington	VA	22206	US	
joann	parrick		Readsboro	VT	5350	US	
Mark	Nelson		Ripton	VT	5766	US	
Jennifer Lynn	Vyhnak		Bristol	VT	5443	US	We need the mature and maturing forests to help mitigate climate change. Time to do what is wise and responsible for the well being of all life. Please listen to what Dr. Bill Moomaw of Tufts University has to say about 'Proforestation'. We need proforestation now, if there is a chance to reverse climate change. He thinks that proforestation is that chance. Thank you for considering and thank you for your courage. God bless us all.
Richard H	Stafursky		Brattleboro Town of	VT	5301	US	
Rachel	Atkins		Richmond	VT	5477	US	
helen	neswald		Saxtons River	VT	5154	US	
Karina	Ryvnine		Saxtons River	VT	5154	US	
Kristina	Franson		Madison	WI	53713	US	

Rita	Monias				R0B 0J0	CA	
Ben	Snyders		West Perth		N0k1 a0	CA	
Ben	Snyders		West Perth		N0k1 a0	CA	Forests are very important please work to protect these areas a lot better!!
Philip2	Allen		Lisburn		BT27 6TS	GB	
Geraldine	McGuckin		Cookstown		BT80 0BQ	GB	
ian	MCMORDIE		Belfast		bt5 6jq	GB	
Kyla	Neustaeter				V0X1 L0	CA	
Angela	May		Pacaembu		12370 20	BR	
John	Warren		Bracknell		RG12 7DE	GB	
Chloe	Hawthorne		High Wycombe		HP13 5QG	GB	



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March 22, 2021

Kathleen Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Via Email [gwsa@mass.gov](mailto:gwsa@mass.gov); Sector-specific comments also submitted via online portal

Re: **Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides, Undersecretary Chang, and the Clean Energy and Climate Plan Team:

On behalf of Mass Audubon, I'm pleased to submit comments on the interim Clean Energy and Climate Plan ("interim CECP") for 2030.

Mass Audubon strongly supports the Commonwealth's initiatives to address climate change. This is a top priority issue, impacting both people and nature in profound ways, from rising sea levels and more intense storms, to droughts and heat impacts -- affecting human health and safety, fisheries and wildlife, forests and wetlands, agriculture, infrastructure, and the economy. We worked extensively in support of the passage of the Global Warming Solutions Act (GWSA) in 2008 and since then have closely followed progress on implementation and further strengthening of Massachusetts' climate actions including the Decarbonization Roadmap to 2050 goal of Net Zero Emissions. Mass Audubon is a member of the GWSA Implementation Advisory Committee (IAC) and endorsed the *Guiding Principles, Cross-Cutting Policy Priorities, and Sector-Specific Policy Priorities for the Clean Energy and Climate Plan for 2030* (October, 2020).

### **Overview**

The CECP for 2030 is vitally important as the steps taken over the next nine years to reduce Greenhouse Gas (GHG) emissions are essential to accelerating progress on decarbonization. We offer the following high-level recommendations for finalizing the 2030 CECP.

**Set a Science-Based Emissions Target for 2030.** Mass Audubon supports a science-based 2030 emissions target that will maximize the Commonwealth's ability to achieve net zero emissions by 2050. As the interim CECP demonstrates, solutions are available on the market now that will enable the state to achieve emissions reductions of 45 to 48 percent by 2030. Massachusetts is required to include goals in the 2030 CECP that "...maximize the ability of the [C]ommonwealth to meet the 2050 emissions limit."

We believe that a 50 percent GHG reduction target, as indicated in Section 10 of *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (“Roadmap Bill”), is essential for maximizing the probability of achieving net-zero emissions by 2050. We recommend that EEA incorporate changes to the 2030 emissions limit based on the outcome of the Roadmap Bill in the final 2030 CECP.

**Projections of GHG mitigation costs are consistently overstated.** Estimates and modeling of GHG mitigation pathways very often overstate the costs of achieving GHG emission reductions, and in tandem have significantly understated *actual* deployment of low-carbon technology and practices. By failing to account for dynamic market effects of strong policy incentives and drivers such as renewable energy performance standards, linear cost projections ignore observed market transformations such as learning curves (also known as ‘learning-by-doing’) and the economies which usually result from producing low-carbon technologies at scale. The cost of solar PV, for example, has declined by 82 percent since 2010, in part due to strong policy incentives set by market leaders like China, the U.S. and Germany<sup>1</sup>. Similarly, Bloomberg New Energy Finance (BNEF) estimates that light-duty electric vehicles could be at price parity with conventional internal combustion engine (ICE) vehicles in the U.S. as soon as 2025<sup>2</sup>.<sup>[2]</sup> We recommend providing fully transparency of all assumptions, data and sources used for estimating costs of achieving a given GHG reduction target. All cost projections should include publicly available estimates which reflect the potential for market transformations induced by strong policy.

In addition, we recommend that when providing estimates of the costs of delivering key GHG mitigation strategies, these be considered and presented alongside a careful accounting of the full societal benefits of successful climate mitigation. These include, but are not limited to, improved public health, reduced risks of extreme weather events, quality jobs, a more sustainable economy, and benefits for environmental justice (“EJ”) populations.

**Deliver a Plan that is Truly Actionable.** As currently drafted, the interim CECP describes a set of critical strategies, but indicates that some are still under consideration or being explored. Other strategies are firmer but lack detail on scale, funding and capacity needed, timing of deployment, and underlying authority. As such, the interim CECP is not yet an actionable plan. To transform the CECP into a truly actionable guide for operationalizing GHG reduction strategies, we recommend adding the following elements to the final 2030 CECP:

- 1. Evaluation of existing authority.** Indicate whether EEA and/or state agencies have existing legal or administrative authority or will need new statutory authority in order to achieve each policy recommendation/strategy action. The 2030 CECP should include requirements (i.e., regulations; eligibility criteria and/or preferential scoring for grant funding) in the appropriate policy recommendation/strategy action.
- 2. Metrics and indicators of progress.** We encourage EEA to develop metrics and indicators of progress and performance for interim time periods (e.g., EVs will be X% of LDV sales by 2025) which are consistent with 2030 and 2050 targets. In addition, we recommend inclusion of timelines to commence each strategy and for partial and complete policy adoption and implementation, as appropriate.
- 3. Identify funding and capacity needs.** The transition to a clean economy will require significant capital

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<sup>1</sup> IRENA (2020). “Renewable Power Generation Costs in 2019.” Available at: <https://www.irena.org/publications/2020/Jun/Renewable-Power-Costs-in-2019>

<sup>2</sup> Bloomberg New Energy Finance (2020). Electric Vehicle Outlook 2020. Available at: <https://about.bnef.com/electric-vehicle-outlook/>

investment. However, these funds will not be sourced solely from the Commonwealth, or its citizens and businesses. Under the Biden Administration, climate leadership states like Massachusetts can expect additional support – both in terms of new policy drivers but also via extension and/or expansion of funding from existing policies and programs such as investment and production tax credits for clean energy (ITC and PTC, respectively) and the Conservation Reserve Program (CRP) for sustainable management of agricultural and pasture lands. We recommend identifying expected sources of funding from within the state, but also sources of potential support from federal agencies, existing programs, and under proposed policies (i.e., new infrastructure package).

- 4. Full alignment of public procurement with GWSA and equity goals.** The Commonwealth should explicitly align all active procurements for goods and services with the goals of the GWSA. Existing state programs including Lead by Example for state buildings and Green Communities are strong models for allocating public funds in ways that are consistent with long-term climate mitigation goals. All existing and new procurements, e.g. for state vehicle fleets, new MBTA vehicles (e.g., busses) must be similarly aligned. Moreover, new procurements should reflect the need to deliver more equitable outcomes – such as access to clean energy resources, improvements to air quality and public health, and access to natural lands – to communities which have historically been overlooked and neglected in delivery of public goods.

The CECP also includes sector-by-sector analyses and makes important new commitments to equity and inclusion in the associated programs and policies. The draft plan also recognizes the role of land as essential to help fill the final 15% reduction in emissions through carbon sequestration.

We recommend the following refinements to sector-specific strategies for the final CECP:

- Strengthen the holistic approach across sectors, including greater emphasis on the role of land and land use, and parity for the Land/Nature Based Solutions actions and other sectors.
- Emphasize strategies that have “no regrets,” e.g. protecting lands of high conservation, resilience, and carbon storage value and guiding smart, compact, energy efficient development close to existing transit and other infrastructure;
- Embrace a mitigation hierarchy of protect, manage, and restore; and
- Prioritize activities within Massachusetts where the Commonwealth has the greatest ability to effect change, while working regionally on energy markets and programs that will leverage broader positive outcomes.

Mass Audubon’s comments below focus in on the role of Natural and Working Lands in the CECP, including intersections of land use with other sectors. We also signed onto joint comments with other groups emphasizing equity and climate justice provisions for the CECP.

### **Natural and Working Lands**

Natural and working lands, including forests, farmlands, and wetlands, provide many benefits, including carbon sequestration and storage, resilience from climate impacts such as floods, drought, extreme heat, and shifting wildlife habitats. These lands also provide many other values including recreation, clean air and water, habitat for fish and wildlife, and overall community character and quality of life. The preservation and restoration of these natural assets should be a high priority for all state programs, including but not limited to the clean energy roadmap to decarbonization.

The draft CECP recognizes that in order to achieve Net Zero by 2050, carbon sequestration must be one of the four pillars supporting that goal. We recommend that the Natural and Working Lands Chapter of

the final CECP contain information and commitments to policies and programs that are of a level of specificity in parity with the other sectors. This should include:

- Increase investments in and specific strategies to fill the gap between the goal of No Net Loss and existing programs and policies. This should include conservation and restoration of forests and wetlands and support for improved farmland practices to increase carbon sequestration and storage.
- Emphasize urban tree plantings and greening; new urban parks; riparian area restoration and tree planting, and other reforestation efforts, with a particular focus on equity and climate justice. Many of these projects will have multiple benefits including reducing urban heat islands, avoiding flood risks, and improving quality of life.
- Focus on partnerships. The Commonwealth can leverage impact by partnering with and providing new and expanded grants to municipalities and nonprofits to conserve, manage, and restore Natural and Working Lands.

Specific comments on strategies:

## **Chapter 6. Protecting our Natural and Working Lands**

### **Strategy L1: Protect Natural and Working Lands**

- **No Net Loss** is an excellent goal that should be broadly embraced, with specific implementation mechanisms. This should go beyond increased incentives for protection, management, and restoration. There should be a specific commitment for all state agencies to review their programs to avoid, minimize, and mitigate the conversion of natural and working lands to the maximum extent feasible. Conflicts between this goal and other state programs should be minimized as much as feasible. An example is the Department of Energy Resources (DOER) solar financing incentive program, which should be revised to avoid and minimize loss of natural and working lands. This strategy should also be included in upcoming revisions to the Massachusetts Environmental Policy Act (MEPA) regulations.
- **Blue Carbon:** Although the Commonwealth has a strong state Wetlands Protection Act, this strategy should be strengthened to expand protection and restoration. It should include specific programmatic improvements such as increased funding for restoration of cranberry bogs that are no longer in production, regulatory revisions to support use of living shorelines and other natural solutions to erosion, sea level rise, and storm surge, and restoration of degraded coastal and inland shorelines, riparian areas, and floodplains.
- **Avoided Conversion:** The strategies should include commitments to improved incentives and regulations to reduce the rate of loss of forests, farmlands and wetlands to development, with target goals for the rates of reduction in conversions.
- **Reforestation:** Include numeric goals for urban and suburban tree planting, restoration of riparian areas, and other reforestation projects.

### **Strategy L2: Manage for Ecosystem Health and Enhanced Carbon Sequestration**

- **Resilient Lands Initiative and Healthy Soils Action Plan Implementation:** Mass Audubon has been involved in both of these initiatives and supports the goals for improved protection and management of forests, farmlands and wetlands. The final CECP should make more specific commitments in regards to follow through on implementation, including identification of new programs and funding that will be needed. Research on methods to improve forest management should continue, but the state should also make more specific commitments to implementing improvements based on best available science, for both public and private forestlands. This should include programs and incentives (e.g., expanding Chapter 61 for landowners who agree to adopt land management plans to maximize carbon sequestration and storage) and the role of the state's lands. The Department of Conservation and Recreation's

Landscape Designations are due for update in 2022, and the CECP should make a specific commitment to this update with public input. The roles of both forest reserves and improved management practices on woodlands should be included.

### **Strategy L3. Incentivize Regional Manufacture and Use of Durable Wood Products**

- **Use of locally harvested wood in long-lived products** such as cross-laminated timber (CLT) for buildings does not directly increase sequestration. However, by substituting wood products for high energy intensive materials like concrete and steel, overall carbon emissions may be reduced. A carefully crafted program around the use of locally-produced wood in enduring products may also incentivize forest landowners to keep their land in forest. CLT wood structures also enable construction of mid-rise buildings for housing and multi-use in locations close to transit and other infrastructure, with cross-sector emissions reduction benefits. The details of this program should be developed with public input.

### **Strategy L4. Develop Sequestration Accounting and Market Frameworks**

- **Accountability:** As noted in the July, 2020 letter from the Natural and Working Lands work group of the IAC, systems need to be established for accountability for the role of land in the emissions reduction goals. The accountability systems should use best practices aligned with international standards of carbon accounting, including a baseline inventory, numeric goals, and standards for measuring and tracking over time. More specific information should be included about what additional analyses will be commissioned and how this work will inform the strategies and actions.
- **Robust stakeholder involvement** should be programmed into this work, and integration with regional market efforts needs to be clarified.

See also comments below regarding cross-references across land use, transportation, and electricity sectors. Choices in state funding and incentives for local and regional infrastructure and development and energy systems have significant implications energy efficiency as well as avoiding and minimizing loss of land to development.

### **Cross-Sector Comments**

#### **Transportation**

### **Strategy T6. Stabilize Light Duty VMT & Promote Alternative Transportation Modes**

- **Cross-references** should be made between the Land Use section and the Transportation/Smart Growth sections.
- **Transit-Oriented Development:** Specific programs and policies to increase incentives for development and redevelopment close to existing transit and walkable downtowns should be included (e.g. water, wastewater, and other infrastructure improvement grant programs).

#### **Electricity**

- **Align renewable energy program incentives to land protection goals:** The draft CECP acknowledges the need to conduct additional planning to optimize the deployment of solar power generation in ways that minimize land conversion, as well as optimizing system reliability and efficiency. The commitment to further study is vague and should be made more specific. Clear interim targets for solar capacity should be set; additional analysis of the availability of rooftops, parking lots, and other already developed lands (over 1 million acres) conducted; technical, financial and administrative barriers to within-development site projects evaluated, and the DOER financial incentive program should be adjusted to

improve desirable siting consistent with land protection goals. The draft plan indicates that rooftops will be inadequate to meet the need, and that up to 60,000 acres of land may be converted to solar arrays. Additional analysis is needed for other types of already altered land such as parking lots and large turfed landscaped areas on commercial, industrial, and government properties - it seems likely that there are at least 60,000 acres of those categories of land. To the extent additional alteration of land is unavoidable, those projects should be sited on least environmentally sensitive lands, and mitigation needs to be established to fund increases in the capacity of land to sequester carbon and provide climate resiliency functions, in order to ensure that the lands goals are met.

- **Transmission Systems Planning:** The Commonwealth is entering into regional planning for transmission system improvements. This should include offshore wind transmission. In addition to cost and reliability, the state should evaluate the relative land impacts of different approaches. Failure to plan for a shared offshore wind transmission system to bring that new source of power to demand markets is likely to result in significant impacts to land, which should be avoided to the extent possible.
- **Incorporate Wildlife Protections into Offshore Wind:** The current round (83C III) of Offshore Wind procurement includes new provisions for both equity and to monitor and protect wildlife. Commitments to avoid, minimize, and mitigate impacts to fish, invertebrates, marine mammals, birds and bats should be mentioned in the CECP, and additional details should be included in offshore wind agreements with developers.
- **Woody Biomass:** Combustion of woody biomass, especially in large-scale facilities, is often highly inefficient and raises concerns regarding impacts on forestlands. We encourage the state to avoid incentivizing biomass systems that are contrary to reducing emissions of GHGs and criteria air pollutants, the role of land in carbon storage, affordable clean energy, or that add to cumulative air quality burdens experienced by environmental justice communities.

As a member of the GWSA Implementation Advisory Committee (IAC), we look forward to working closely with EEA, agency staff, stakeholders and the public to finalize the 2030 CECP. We offer these comments and recommendations for your consideration as you update and finalize the Plan in the coming weeks.

Thank you for close review and consideration of these comments.

Sincerely,



Michelle Manion  
Vice President for Policy and Advocacy





Ms. Kathleen A. Theoharides  
Secretary of Energy and Environmental Affairs  
Massachusetts Executive Office of Energy and Environmental Affairs  
100 Cambridge St, Suite 900  
Boston, MA 02114

RE: Interim Clean Energy and Climate Plan for 2030

Unison Energy, LLC (“Unison”) develops, builds, owns, operates and maintains on-site, turnkey microgrid energy generation solutions at commercial and industrial customer locations financed through 15-to-20-year, energy services agreements (“ESA’s”). Our customers only pay for the energy they use and have no capital or operational investment obligations. Customer benefits include energy cost savings, improved energy resilience which benefits business continuity, sustainability benefits via emission reductions and, major energy efficiency related capital improvements financed and managed by a third party. Unison’s microgrids are designed with energy baseloads covered by natural gas-based cogeneration systems (“CHP”); they can be further optimized by integrating technologies like solar and battery energy storage systems (“BESS”) storage (together, Distributed Energy Resources (“DERs”). Central plant upgrade costs (e.g., boilers, chillers, variable frequency drivers (VFD)’s, etc.) as well as EV charging are sometimes included in the ESA’s. Unison believes that to achieve our commercial and industrial customer’s energy cost, resiliency and sustainability goals that a comprehensive approach must be used inclusive of all major DER technologies – CHP, solar and BESS.

Unison respectfully submits the following comments in response to the Interim Clean Energy and Climate Plan for 2030 (2030 CECP). These comments address the proposed phase-out of incentives for fossil-fuel heating systems between 2022 and 2024, and the benefits of Combined Heat and Power (CHP) systems even as the electric grid decarbonizes. We urge the Executive Office of Energy and Environmental Affairs to revisit its proposal to end incentives for CHP, and continue rewarding high efficiency, environmentally superior CHP systems.

CHP systems participating in Mass Save and the Alternative Portfolio Standard programs provide a suite of benefits to ratepayers that will still be realized up to, and potentially beyond 2050. They reduce the emission of CO<sub>2</sub> and other criteria pollutants, as well as providing on-site electric and thermal resiliency. We suggest as one resource examining the benefits that are quantified for CHP projects that have received the Mass Save incentive, and urge that the Executive Office of Energy and Environmental Affairs utilize program information on CO<sub>2</sub> reductions from CHP in their decision of whether to continue incentivizing projects. Another, albeit anecdotal, data resource are the several US EPA CHP Award winning projects based in Massachusetts that have self-certified significant CO<sub>2</sub> reductions as well as dozens of Massachusetts businesses that have made public statements on the CO<sub>2</sub> reductions from their CHP investments.

CHP provides a significant CO<sub>2</sub> savings relative to current Massachusetts grid emissions. The NE-ISO Load-Weighted Marginal Unit (LMU) marginal emission rate for 2018 was 745 lbs. CO<sub>2</sub>/kWh, and the eGRID Non-Baseload emissions rate for the NE ISO, which is used to calculate CO<sub>2</sub> savings from Mass Save projects, is 931 lbs. CO<sub>2</sub>/kWh. According to a 2019 study by ICF, *As the Grid Gets Greener, Combined Heat and Power Still Has a Role to Play*, GHG savings with CHP as a core component of DER resources will continue at least through 2050 all over the US. In this report, CHP emissions are estimated at 652 lbs. CO<sub>2</sub>/kWh when accounting for offset boiler emissions. Using either 745 lbs. CO<sub>2</sub>/kWh or 931 lbs. CO<sub>2</sub>/kWh, CHP provides a significant CO<sub>2</sub> savings, and will until marginal grid emissions are drastically reduced in the 2050's. For larger commercial and industrial facilities, CHP is the only technology that can provide energy during a prolonged grid outage as recently experienced in Texas ERCOT; these types of weather events will increase and intensify over the coming decades and Massachusetts needs to provide its commercial and industrial customers with robust energy generation alternatives.

This savings relative to marginal grid emissions, combined with CHP's high capacity factor, leads to significant CO<sub>2</sub> savings, even compared to the same MW of installed wind and solar. According to a study by Entropy Research, LLC. 10MW of CHP with an 85% capacity factor can provide 33,533 tons of CO<sub>2</sub> savings compared to eGRID non-baseload emissions on an annual basis. For comparison, the same study found that 10MW of solar with an average capacity factor of 26.1% saved 17,159 tons of CO<sub>2</sub> annually, and 10MW of wind with an average capacity factor of 37.4% saved 24,501 tons of CO<sub>2</sub> annually. CHP can provide nearly double the carbon savings of solar and a 50% increase in savings compared to wind, for the same number of MW installed.

CHP systems also provide savings in the wholesale energy and capacity markets, and by decreasing energy imported from outside Massachusetts, keeping dollars in the state economy. CHP systems can reduce transmission and distribution costs, both for reduced capital expenditure in congested areas and in reduced O&M costs, benefiting ratepayers and increasing grid reliability. Investing in CHP also provides direct and secondary economic benefits to the state economy through industry design and construction jobs, as well as service jobs. We suggest that the FULL picture of the benefits of CHP, vis-à-vis all other clean heating and cooling technologies, ought to recognize these important ratepayer and societal benefits.

CHP uniquely provides a suite of benefits to ratepayers that include the following:

- Reduction in criteria pollutants,
- Reduction in CO<sub>2</sub> (greenhouse gas) emissions,
- Power and Thermal Energy **resiliency** for appropriately designed CHP systems,
- Economic multiplier benefits (importing less energy) keeping dollars in MA economy,



- Local job creation, direct industry jobs, service jobs,
- Critical infrastructure support including health-care, hospitals, research, pharmaceuticals, key supply chain products and services,
- Energy and capacity savings,
- Reduction in utility transmission and distribution (T&D) capital costs benefiting ratepayers,
- Reduction in utility T&D operating and maintenance costs benefiting ratepayers, and
- Reduction in local T&D congestion, enhancing the network reliability.

Sincerely yours,

*Andrew C Cooper*

Andre C. Cooper  
Co-CEO  
Unison Energy, LLC

**COMMENTS OF BROOKFIELD RENEWABLE ON THE CLEAN  
ENERGY AND CLIMATE PLAN FOR 2030**

Brookfield Renewable<sup>1</sup> appreciates the opportunity to provide comments on the Clean Energy and Climate Plan for 2030 (“2030 CECP”), issued December 30, 2020. Brookfield Renewable greatly appreciates the efforts of the Executive Office of Energy and Environmental Affairs (“EEA”) in developing the 2030 CECP and providing the opportunity for public education and engagement.

Brookfield Renewable supports both the implementation of a 2030 emissions reduction requirement of *at least* 45% below 1990 level, as proposed in the 2030 CECP, as well as many of the corresponding action items proposed to meet the 2030 emissions reduction requirement. While there are many elements of the 2030 CECP of interest to Brookfield Renewable’s operations in Massachusetts and throughout the region, we have focused these comments on two Strategies and corresponding action items that can be enhanced for the benefit of Massachusetts ratepayers and policy attainment.

*Strategy E2: Develop and Coordinate Regional Planning and Markets*

Brookfield Renewable supports broader regional coordination and the evolution of wholesale electricity markets. As part of these efforts, Brookfield Renewable recommends:

- Examination of Massachusetts’ pumped hydropower fleet, including its role in accommodating the region’s low-carbon or zero-carbon electricity goals, and the development of market design that more adequately values the fast ramping and load-following capabilities of this asset class.
- Establishment of a carbon price, or an alternative like the proposed Forward Clean Energy Market, to ensure non-emitting attributes are considered in market design and dispatch.

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<sup>1</sup> Brookfield Renewable’s Massachusetts facilities include a 600MW pumped hydropower storage facility (Bear Swamp), a 10MW hydroelectric facility (Fife Brook) and 170 MW of distributed solar generation. In addition, Brookfield Renewable’s North American System Control Center is located in Marlborough.

- Coordinated regional transmission planning and consideration of options that promote more efficient delivery of both existing and new renewable generation sited throughout New England, including renewable generation located in the Northern Maine Independent System Administrator (NMISA) region.

*Strategy E3: Align Attribute Markets with GWSA Compliance*

Clean Energy Standard Expansion

Brookfield Renewable strongly supports the 2030 CECP's proposed expansion of the Clean Energy Standard (CES) and we agree that increasing the CES to at least 60% by 2030 to accommodate 83D procurement is a sensible approach to seamlessly expanding Massachusetts' commitment to clean energy and promoting incremental renewable generation.<sup>2</sup> As part of such program expansion, Brookfield Renewable recommends consideration of more granular requirements embedded in the CES/RPS to require renewable energy deliveries that match real-time load on a 24-hour basis as opposed to merely a MWh requirement that does not consider time of production. This load following requirement creates a more robust standard that better aligns with Massachusetts' long-term policy goals.

Treatment of Existing Renewable Generation

Equally important to promoting new resource deployment is supporting existing renewable generation, including the region's existing hydropower. Promoting retention of the region's legacy renewable generation fleet optimizes existing infrastructure and land use and avoids costly and counterproductive loss of clean energy output. In addition, should the Legislature advance a more aggressive 2030 emissions reduction requirement, as is currently under consideration, expanded reliance on existing renewable resources offers a cost-effective path to achieving incremental requirements. To achieve this, Brookfield Renewable recommends:

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<sup>2</sup> 2030 CECP at p. 40

- Evolution of DOER’s methodology for the RPS Class II renewables demand to require annual Class II requirements above the current ceiling of 3.6% of electricity sales. Specifically, Brookfield Renewable believes an increase to at least 4.5% would better promote resource retention and delivery of Class II eligible small-scale hydropower.
- Expansion of the Clean Energy Standard for existing clean generation (CES-E) to a level that aligns with the 2030 CECP’s proposed CES expansion (i.e., 50% above current program requirements) in order to promote retention of resources that have historically delivered clean energy to Massachusetts.

Expanding these programs is more necessary than ever before as neighboring states like New York pursue robust efforts, including long-term contracting programs, to ensure environmental attributes associated with existing renewable energy stays within the state. In the absence of adequate valuation, resources that could otherwise meet Massachusetts’ aggressive clean energy goals may seek to deliver elsewhere.

#### Application to Municipal Lighting Plants

Brookfield Renewable agrees with the 2030 CECP’s assertion that more must be done to ensure that Municipal Light Plants (MLPs) decarbonize at a pace that aligns with the Commonwealth’s 2030 carbon reduction goal. One such approach that adequately acknowledges the need for establishing compliance requirements while also providing flexibility in early years could include the establishment of a Clean Energy Standard for MLPs, beginning as early as 2022, that allows CES and CES-E eligible generation attributes to satisfy compliance obligations, and offers appropriate treatment for legacy contracts, until 2030. After 2030, MLP requirements should be transitioned to match compliance requirements, including, RPS, CES and Clean Peak Standard requirements, that are applicable to utilities and competitive suppliers.

**Brookfield**

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Respectfully submitted,

A handwritten signature in black ink, appearing to read "Steve Zuretti", with a long, sweeping horizontal stroke extending to the right.

Steve Zuretti  
Senior Director, Government Affairs and Policy  
Brookfield Renewable  
[steven.zuretti@brookfieldrenewable.com](mailto:steven.zuretti@brookfieldrenewable.com)  
323-400-9715

March 22, 2021



# **INTERIM CLEAN ENERGY AND CLIMATE PLAN FOR 2030 – COMMENTS**

March 22, 2021

## **Prepared For**

Massachusetts Executive Office of Energy and  
Environmental Affairs

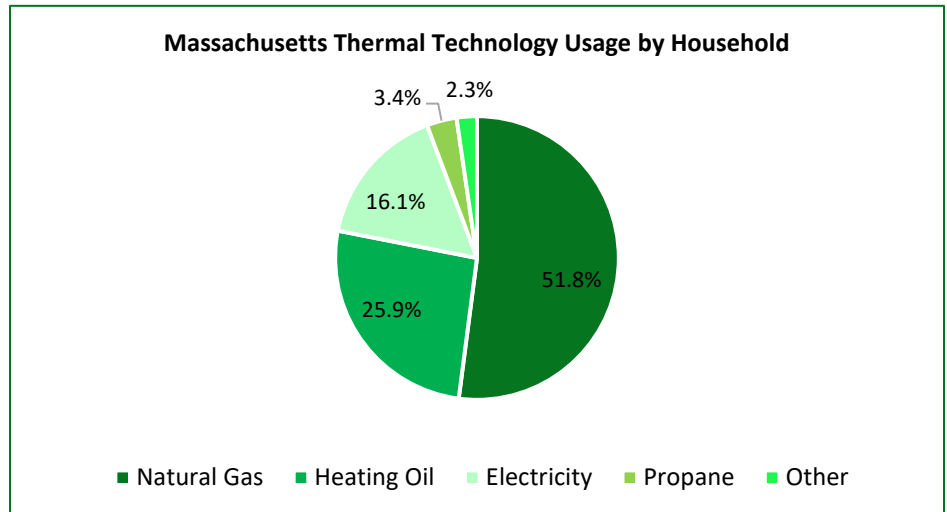


## Introduction

Diversified Energy Specialists, Inc. (DES) is a renewable energy consulting and environmental markets trading corporation located in Massachusetts. DES is an aggregation in the Massachusetts Alternative Energy Portfolio Standard. DES represents clients generating alternative energy certificates from many technologies, including air-source heat pumps, ground-source heat pumps, solar thermal, liquid biofuels, and woody biomass. The consulting work of DES is focused on reducing greenhouse gas emissions from the building sector to combat climate change in a timely and equitable fashion. The following comments on the Interim Clean Energy and Climate Plan for 2030 will be geared towards the building sector and Massachusetts Executive Office of Energy and Environmental Affairs recommendations for transforming the residential heating industry.

## I. Massachusetts Building Sector

### A. Thermal Technologies



#### 1. Natural Gas

Natural gas provides heat to 51.8% of Massachusetts households and is the largest generator of electricity in Massachusetts. While natural gas has a lower carbon score than both heating oil and propane, its potential to reduce greenhouse gas emissions over time is minimal. The most generous projections estimate that only 25% of the natural gas supply in the United States will be renewable by 2050.

#### 2. Propane

Propane cannot reduce its carbon intensity at scale.

#### 3. Heating Oil & Biodiesel

Renewable biodiesel can be blended with heating oil up to a 50% blend (B50), without requiring any equipment adjustments. Biodiesel is a drop-in fuel that adds zero additional cost to the end user. Any building in Massachusetts that has a heating oil system can receive biodiesel blends of 50%, which would reduce greenhouse gas emissions compared to heating oil of up to 45%, meeting Massachusetts' 2030 emission reduction goal.

<sup>1</sup> US Census Bureau, 2019 ACS 5-year Estimates, Occupied Housing Units by House Heating Fuel

#### 4. Heat Pumps

Massachusetts has the fifth most expensive average retail price of electricity in the United States, averaging \$18.40 cents/kWh in 2019. Each MWh of electricity produces an average of 871 lbs. of carbon dioxide.<sup>2</sup>

While air- and ground-source heat pumps produce the lowest greenhouse gas emissions of any thermal technology, their high upfront capital investment cause a barrier to entry that most low- and middle-income residents in Massachusetts cannot afford.

Additionally, air-source heat pumps cannot sufficiently heat Massachusetts residences in the cold winter months and must rely on a supplementary heat source for 10-25% of the annual heat load. Typically, the supplementary heat source for air-source heat pumps is electric resistance heat. Electric resistance heating is the most expensive and highest greenhouse gas emitting thermal technology.<sup>3</sup>

Air-source heat pump installations will add load to the electric grid in the winter. Greenhouse gas emissions from electricity are higher in the winter due to the lower generation of intermittent renewable resources. Electricity prices are also higher in the winter, which will be exacerbated by added grid load from Air-source heat pump installations. The burden of higher electricity prices from air-source heat pump installations will be placed upon all ratepayers, not just the residents who install air-source heat pump systems.

#### B. Emissions Analysis<sup>4</sup>

Lbs. CO<sub>2</sub>e/MMBTU heat delivered - 100-year global warming potentials – Abiogenic Emissions

**ULSD Heating Oil:** 228.8 lbs CO<sub>2</sub>e/MMBTU

**Propane:** 206.1 lbs CO<sub>2</sub>e/MMBTU

**Natural Gas (Municipal Grid):** 188.3 lbs CO<sub>2</sub>e/MMBTU

**ISO NE Air Source Heat Pump – Non-baseload Electricity Mix:** 152.3 lbs CO<sub>2</sub>e/MMBTU

**ISO NE Ground Source Heat Pump – Non-baseload Electricity Mix:** 101.2 lbs CO<sub>2</sub>e/MMBTU

**Plant-based Biodiesel (Soybean Oil Feedstock):** 90.8 lbs CO<sub>2</sub>e/MMBTU

**Animal-based Biodiesel (Tallow Feedstock):** 63.7 lbs CO<sub>2</sub>e/MMBTU

**Used Cooking Oil-based Biodiesel:** 35.9 lbs CO<sub>2</sub>e/MMBTU

##### 1. Biodiesel Emissions

Each gallon of biodiesel that displaces heating oil reduces greenhouse gas emissions by roughly 19.598 lbs. of CO<sub>2</sub>e at zero cost to the end user. 5-10% biodiesel blends can achieve a better carbon score than propane, 5-25% biodiesel blends can achieve a

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<sup>2</sup> <https://www.eia.gov/electricity/state/Massachusetts>

<sup>3</sup> Kearney – Heat Source Carbon Footprint Comparison

<sup>4</sup> Kearney – Heat Source Carbon Footprint Comparison

better carbon score than natural gas and 30-50% biodiesel blends can compete with cold climate heat pumps in the Northeast.

## 2. Heat Pump Emissions

Air-source heat pump installations will add grid load to the winter peak load. These systems will run during winter peak hours and cannot shift their load to off-peak hours. The winter peak load in ISO-NE produces the highest greenhouse gas emissions from electricity and often will use a larger percentage of heating oil and coal than renewable resources to produce electricity. Adding grid load during these peak hours will require additional fossil fuel electricity generation and will increase the cost of electricity for all ratepayers.

## C. Economics of Greenhouse Gas Reduction

Reducing greenhouse gas emissions comes at a cost to the end user. Analyzing the four most prevalent thermal technologies in Massachusetts; heating oil, natural gas, electricity, and propane, only heating oil and electricity can reduce their greenhouse gas emissions on a large scale.

DES developed a list of key metrics to evaluate the value of each thermal technology and their ability to economically reduce greenhouse gas emissions in Massachusetts.

Capital Investment Required: The capital investment required to reduce greenhouse gas emissions vs. the alternative. The cost of each unit. (High, Moderate, Low, Zero)

Widespread Adoption Potential: Considering the capital investment required, the emissions reduction vs. the alternative, and equipment currently in use. (High, Moderate, Low)

Adoption Speed: How quickly can residences begin providing emissions savings to Massachusetts? (Slow, Moderate, Fast)

Greenhouse Gas Savings to Massachusetts: The total emissions savings from each technology. (High, Moderate, Low)

**Table 6: Thermal Low-Carbon Technology Comparison**

Technology	Capital Investment Required	Widespread Adoption Potential	Adoption Speed	GHG Savings to MA
<b>ASHP</b>	High	Low	Slow	High
<b>GSHP</b>	High	Low	Slow	High
<b>Biodiesel</b>	Zero	High	Fast	High

Biodiesel blends can be delivered to the 25.9% of Massachusetts residences that have heating oil systems immediately. Heating oil distributors that begin delivering biodiesel will immediately provide greenhouse gas reductions to the thousands of residences they serve at zero cost to the end user. The ability to use biodiesel as a drop-in fuel and the abundant supply of domestic biodiesel that currently exists will allow the 25.9% of Massachusetts residences to reduce their carbon emissions by up to 45% with a B50 blend immediately.

Air-and-ground source heat pump installations require a significant capital investment from each residence. The high capital investment alienates lower socioeconomic classes from installing air-source heat pump systems and only allows higher-income residences to benefit from the greenhouse gas savings provided by heat pumps.

## II. Renewable Liquid Heating Fuel Industry

### A. The Providence Resolution

The Northeast's heating oil industry held their 2019 annual summit, Heating & Energizing America Trade Show, at the Rhode Island Convention Center. The industry unanimously passed The Providence Resolution, which calls for a reduction in greenhouse gas emissions, based on 1990 levels, of 15% by 2023, 40% by 2030, and net-zero-carbon emissions by 2050.<sup>5</sup>

### B. The Benefits of Biodiesel<sup>6</sup>

Biodiesel achieves greenhouse gas emissions reductions of up to 80% compared to oil-fired combustion systems and about 70% compared to natural gas-fired systems. Biodiesel is abundant and commercially available now. Given the urgency of climate change mitigation, carbon savings achieved today are far more valuable than what might be accomplished 20 or 30 years from now. Biodiesel is a drop-in fuel that can be implemented now, with no additional cost to the end user and no equipment modifications. Biodiesel is currently being used at 50% blends (B50) by retail home heating companies in Massachusetts and has shown no operability issues.

Biodiesel provides cost savings to electric ratepayers. During the cold winters in Massachusetts, as the grid load increases, the cost and carbon intensity of power generation at the margin, produced to meet thermal loads, increase as older generation facilities come online and less environmentally friendly fuels, such as coal and heating oil, are used. As Massachusetts seeks to achieve a fully renewable electric grid, biodiesel can provide the thermal sector with low-carbon heat, while reducing the added grid load and winter peak load that would occur with wide-scale

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<sup>5</sup> [https://nefi.com/files/8815/6874/3153/2019\\_Industry\\_Summit\\_Resolution\\_20190916\\_Final.pdf](https://nefi.com/files/8815/6874/3153/2019_Industry_Summit_Resolution_20190916_Final.pdf)

<sup>6</sup> National Biodiesel Board

ASHP installations. Using biodiesel for the thermal sector will provide cost savings to all ratepayers.

### C. Environmental Justice Populations

Environmental Justice populations will benefit from the adoption of biodiesel in Massachusetts. The large energy affordability gap in Massachusetts is a growing problem and a high percentage of Massachusetts' residence are in climate poverty, spending greater than 10% of their annual income on energy. Low-income communities have worse air-quality, which leads to health concerns. Attempts to electrify the thermal sector will only exacerbate these problems. Air-source heat pump installations require a large, upfront capital investment which residents in low-income communities cannot afford. Electrification policies will incentivize air-source heat pump installations in high-income communities, while the middle-and-low-income residents in Massachusetts will be unable to afford these installations. The result will be better air quality in high-income communities, greater greenhouse gas emission inequity, higher cost of electricity for all ratepayers, even those not benefiting from the air-source heat pump installations, a larger affordability gap, and a larger percent of the population in climate poverty. Electrification policy benefits the high-income residents of Massachusetts, while the low-income residents are hurt by these policies.

Biodiesel is the only solution to the greenhouse gas inequities in Massachusetts. Biodiesel can immediately reduce greenhouse gas emissions in the 25.9% of households that use heating oil. These greenhouse gas emission reductions can be achieved in low-income communities without equipment modifications and at zero additional cost to the end-user. Biodiesel can tighten the energy affordability gap, while lowering greenhouse gas emissions in environmental justice communities.

## III. The Fallacies of Electrification

### A. Air-Source Heat Pump Field Studies

The ISO-NE Final 2020 Heating Electrification Forecast<sup>7</sup> and the ISO-NE 2020 CELT Report<sup>8</sup> provide inaccurate projections on the electrification of space heating. These two reports by ISO-NE projected 749,900 ASHP installations in New England by 2030. ISO-NE used licensed advanced metering infrastructure (AMI) data from Sagewell, Inc. to develop their electricity consumption estimates per ASHP installation and estimated demand impacts of ASHP adoption. ISO-NE used the analysis and regression modeling performed on the average hourly electricity consumption of 18 residential AMI profiles in northeastern Massachusetts. "Each profile corresponds to a residence where an ASHP was installed between the winters of 2017/2018 and 2018/2019, which enables a direct comparison of winter electricity consumption before and

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<sup>7</sup> [https://www.iso-ne.com/static-assets/documents/2020/04/final\\_2020\\_heat\\_elec\\_forecast.pdf](https://www.iso-ne.com/static-assets/documents/2020/04/final_2020_heat_elec_forecast.pdf)

<sup>8</sup> <https://www.iso-ne.com/system-planning/system-plans-studies/celt/>

after ASHP adoption.” These 18 residences were “a mixture of natural gas and oil legacy heating fuels” and had a “variety of ASHP heating capacities”. Using this data, ISO-NE concluded that the 749,900 ASHP installations in New England by 2030 would add 661 MW to the winter peak demand and would add 1,715 GWh of annual energy to the grid load.

The ISO-NE projections do not reflect a whole home conversion. In fact, when DES emailed ISO-NE questioning their projections, ISO-NE responded, “Summary of Case # (00043718): ... The 18 residential ASHPs used in the analysis reflect a variety of legacy heating displacement. In aggregate the selected sites represent <50% legacy heating displacement.” The ISO-NE projections show that these ASHP installations effectively serve as a supplementary heat source.

## **B. Information Not Considered in the CECP**

### **1. Heat Pumps Not Being Used for Heating**

The ISO-NE reports bring up a much bigger issue that needs to be explored across the Northeast and was not considered in the CECP. Are air-source heat pump installations being used to heat residences in the Northeast? Every year, taxpayer dollars are used to provide incentives and rebates to residences that install air-source heat pumps to heat their homes. In 2019, Massachusetts allocated millions of taxpayer dollars to incentivize air-source heat pump systems.

The AMI data used for the 18 residences in Northeast Massachusetts in the ISO-NE report shows that many of those residences did not use their air-source heat pumps in the winter at all. Many other field studies (Real-Life Air Source Heat Pump Performance Testing – Results and Reasons<sup>9</sup>, Hudson Valley Heat Pump Program<sup>10</sup>, Ductless Mini-Split Heat Pump Impact Evaluation<sup>11</sup>, Electrifying Our Small Building Stock: Lessons Learned from The Field<sup>12</sup>) show significantly lower COP’s and operating hours compared to what had been expected by project sponsors, indicating that generally less than half of homeowners use their heat pumps to any significance during the winter. Yet, several of the reports do indicate that heat pump usage during the summer is close to the expectations of the project sponsors.

After analyzing the ISO-NE reports and the other field studies of ASHP installations listed above, the logical conclusion is that despite taxpayer dollars in Massachusetts and other Northeast states being used to incentivize air-source heat pumps for residential heating, residences are only using the heat pumps as air conditioning systems.

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<sup>9</sup> <https://www.encyvermont.com/Media/Default/bbd/2018/docs/presentations/efficiency-vermont-bbd-real-life-air-source-heat-pump-perfomance-testing.pdf>

<sup>10</sup> Hudson Valley Heat Pump Program, “Deep dive Webinar: Results to Date, Energy Futures Group, October 31, 2019.

<sup>11</sup> <http://www.ripuc.ri.gov/eventsactions/docket/4755-TRM-DMSHP%20Evaluation%20Report%2012-30-2016.pdf>

<sup>12</sup> <https://nesea.org/file/24261/download?token=2QocEKBc>

Many questions arise when attempting to understand this consumer behavior. Are heat pumps not being used in the winter because they can not sufficiently heat homes? Are they not being used because it is too expensive to heat your home with electricity? With this abundance of data, why are taxpayer dollars still being earmarked for these programs in Massachusetts and other Northeast states? If consumers are not willing to embrace air-source heat pumps for their residential heating needs, why are state governments insisting that electrifying the thermal sector is the only solution to meet their 2030 and 2050 greenhouse gas reduction goals? These are answers that need to be addressed in the 2030 Interim CECP.

## 2. Electric Transmission Infrastructure Improvements

Objective 5 in Connecticut DEEP's "2020 IRP Organization – Six Key Objectives" is "Transmission Upgrades & Integration of Variable and Distributed Energy Resources". Connecticut DEEP states, "New England's existing transmission infrastructure can effectively support only a limited amount of new zero carbon generation". Why hasn't the MA 2030 CECP considered transmission infrastructure improvements. Will the burden of transmission infrastructure improvement costs be passed-on to ratepayers in the form of higher electricity prices?

## 3. Time Value of Emissions Reduction<sup>13</sup>

Reducing greenhouse gas emissions today is more important than reducing greenhouse gas emissions in the future. It is important to meet Massachusetts's 2030 and 2050 greenhouse gas reduction goals, but it is just as important to start reducing greenhouse gas emissions today. Meeting a specific benchmark in 2030 does not account for the timing of greenhouse gas emissions, the cumulative impact of those emissions, or its long-term impact after 2030. Like compounding interest, timing matters.

If Massachusetts set a goal of reducing greenhouse gas emissions by 20% from the building sector by 2022, biodiesel is the only thermal technology that could reduce emissions by those levels immediately and at zero cost to the end user. A 50% biodiesel blend would reduce greenhouse gas emissions by roughly 45%, would not require any equipment changes and would not add any additional cost to the end user. There is adequate supply of domestically produced biodiesel to support increasing demand and to reduce greenhouse gas emissions in Massachusetts today.

## 4. Utility Billing Practices

The energy supply charge portion of an electric bill represents the wholesale cost of power generation plus transmission to bring electricity to the utility local distribution system. In ISO-NE, the wholesale cost of electricity is higher in the winter than any other season. In many states, utilities use an averaging function of varying periods of time to

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<sup>13</sup> Renewable Energy Group, Carbon Reduction Now!



smooth-out the cost of electricity to customers. In Massachusetts, some of the largest utilities use a 6-month averaging period. This averaging period hides the high wholesale cost of electricity during the peak winter hours. As Massachusetts residences install air-source heat pumps for their heating needs, the added winter grid load and added winter peak load will drive the wholesale cost of electricity in the winter even higher. These added costs are smoothed out over 6-months to the ratepayer, hiding the price increase from air-source heat pump installations and deceiving the ratepayer.

In Texas, for example, a winter storm drove the winter peak load to a three year high last month<sup>14</sup> (February 12-15, 2021). 61.1% of households in Texas use heat pumps for their winter heating. The added grid load from wide-spread heat pump usage increased the wholesale cost of electricity by over 5,000% and the real-time wholesale price for 1 MW of electricity was \$9,000 for the duration of the long weekend.<sup>1516</sup> The additional grid load has resulted in rolling blackouts and system failures. In the below freezing weather, more than 4.3 million households are currently without power in Texas<sup>17</sup> (February 15, 2021).

Massachusetts cannot allow utilities to hide the cost of wholesale electricity, which will continue to rise with the increase of ASHP installations, from ratepayers by allowing the utilities to average their energy supply charge over a 6-month period. Ratepayers deserve transparency. If ratepayers understood the price increase that is coming from transmission infrastructure upgrades and added winter grid load from ASHP installations, I wouldn't expect that they would support the conclusions in the CECP.

## C. Equity Concerns

### 1. Ensuring Energy Affordability and Equity for all Ratepayers

Every resident in Massachusetts deserves access to renewable thermal technologies, but most low carbon and renewable thermal technologies require a large capital investment. The high cost is a barrier to entry for most Massachusetts residents and it disproportionately impacts low-income communities.

Any Massachusetts resident with a heating oil system in their home or apartment building could receive a biodiesel blended fuel that reduces greenhouse gas emissions by up to 80% vs. the alternative. The homeowner will not have to pay an additional cost for the biodiesel and no equipment adjustments or modifications are required up to a

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<sup>14</sup> <https://abc13.com/texas-power-grid-outages-rolling-blackouts-brownouts/10340431/>

<sup>15</sup> <http://www.ercot.com/content/cdr/contours/rtmLmp.html>

<sup>16</sup> <https://www.forbes.com/sites/joshuarhodes/2021/02/14/valentines-day-giving-the-texas-electric-grid-the-cold-shoulder/?sh=5eddb2d8740c>

<sup>17</sup> <https://poweroutage.us/area/state/texas>

B50. The resident will not have to save up for years to invest in an air-source heat pump installation that could cost \$15,000 - \$20,000 and require a secondary heat source.

ASHP installations will not occur in environmental justice populations. Understandably, these populations cannot afford a high, upfront capital investment to retrofit their home with an ASHP system. The only low-carbon thermal technology that environmental justice populations can afford is biodiesel, since it will cost them no more than what they are currently paying for heating oil.

## IV. Alternative Energy Portfolio Standard

### A. Success of the Massachusetts APS

The Massachusetts Alternative Energy Portfolio Standard began incentivizing biodiesel at the distributor level in 2018. When the program began, only 8 distributors were participating. As of December 2020, 75 distributors are delivering biodiesel blends above 10% to their customers. Through the first half of 2020, more than 57 million gallons of heating oil had been displaced by biodiesel in the APS, eliminating 1,116,825,889 lbs. of carbon dioxide equivalent emissions. In the first six months of 2020 alone, 287,068,220 lbs. of carbon dioxide equivalent emissions were eliminated. These greenhouse gas savings have been accomplished at zero cost to the end user.

Eliminating MassSave incentives for heating oil systems will directly contradict the intended incentives of the MA APS program. It will also disproportionately impact low-income communities.



## **Comments of Environmental Defense Fund March 22, 2021**

Environmental Defense Fund (“EDF”) appreciates the opportunity to submit comments regarding the Clean Energy and Climate Plan for 2030 (“CECP”). While the Commonwealth’s goal of reaching its greenhouse gas (“GHG”) emissions reduction target for the next decade requires significant contributions from all energy sectors, the comments offered by EDF focus on the reduction in the use of natural gas. EDF submits these comments along with an associated whitepaper to assist the Commonwealth in developing a process to help ensure the prudent management of the decarbonization and contraction of the natural gas distribution system, while ensuring continued safe and reliable service.

The CECP builds on both the Massachusetts Decarbonization 2050 Roadmap (“MA Roadmap”) and the Commonwealth’s previous implementation of the Global Warming Solutions Act, to determine how to proceed in reducing GHG emissions through 2030.<sup>1</sup> Specifically, the CECP sets the GHG emissions target for the next decade at 45% reduction below the 1990 level in 2030.<sup>2</sup> To help achieve this goal, the CECP states that any infrastructure, including natural gas pipelines, needs to “align with the Commonwealth’s decarbonization pathways or be replaced before the end of its useful life.”<sup>3</sup>

Further, the CECP references an investigation that is currently underway at the Massachusetts Department of Public Utilities (“DPU” or “Department”) requiring Massachusetts gas utilities to develop plans and recommendations regarding the role that Massachusetts gas utilities can take to help the Commonwealth achieve its goal of net zero GHG emissions (“Investigation”).<sup>4,5</sup> The Order opening the Investigation acknowledges that the energy “transition requires the Department to consider new policies and structures that would protect ratepayers as the Commonwealth reduces its reliance on natural gas, and it may require LDCs to make significant changes to their planning processes and business models.”<sup>6</sup> However, as the Investigation has

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<sup>1</sup> CECP at page 6.

<sup>2</sup> Id.

<sup>3</sup> Id. at page 12.

<sup>4</sup> CECP at page 33, n.40.

<sup>5</sup> Investigation by the Department of Public Utilities on its own Motion into the role of gas local distribution companies as the Commonwealth achieves its target 2050 climate goals, D.P.U. 20-80, Vote and Order Opening Investigation at page 2 (October 29, 2020) (“Order”).

<sup>6</sup> Order at page 2.

been framed, it is unclear how and when review of planning processes, business models, and regulatory policies and structures will take place.

EDF acknowledges that the Department’s action in the Investigation is an important first step in placing the LDCs it regulates on a promising pathway towards climate goal compliance. However, the scope of the Investigation doesn’t go far enough and more can be done. For example, there remains a need to address existing—and in most instances outdated—policies, programs, and processes that lead to continued, and often unchecked, investments in the gas system today. These policies, programs, and processes determine how much gas is perceived to be needed for the system, how much new and existing infrastructure is required to supply that gas, which resources will meet those needs, and who will bear the costs of those resources.<sup>7</sup> Revisiting and refining these existing policies in the context of the current climate goals is a foundational step to decarbonization.

As other state commissions have done, the DPU could address these issues on multiple, or even parallel tracks. For instance, in initiating a review of its gas planning procedures, the New York Public Service Commission directed its Staff to submit a proposal “for a modernized gas planning process that is comprehensive, suited to the forward-looking system and policy needs, designed to minimize total lifetime costs, and inclusive of stakeholders.”<sup>8</sup> The California Public Utilities Commission opened a multi-track proceeding to update reliability standards, determine regulatory changes to improve the coordination between gas utilities and gas-fired electric generators, and implement a long-term strategy to manage the state’s transition away from fossil gas.<sup>9</sup> These are just two examples of the types of inquiries the Department could require in order to gather the necessary information it needs to act on these critical matters and resolve the pressing disconnect between existing gas policies, programs, and processes and the Commonwealth’s ambitious climate goals. Absent this broader look, valuable time will be lost in aligning this industry with the Commonwealth’s decarbonization goals as contemplated in the

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<sup>7</sup> Existing processes continue to assume year-over-year gas sendout and encourage gas expansion. See, e.g., Boston Gas Company/Colonial Gas Company d/b/a National Grid; D.P.U. 18-148 November 1, 2018 through October 31, 2023 Long-Range Resource and Requirements Plan at page 5 (November 1, 2018) (“National Grid projects incremental sendout to traditional markets of 8,527 BBtus over the forecast period or 2,132 BBtus per year (assuming normal weather) (see Chart III-A-1, Base Case). Overall, this growth represents a 7.1 percent total increase in sendout requirements over the forecast period, or 1.7 percent per year on average.”); Order on Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of a Natural Gas Customer Expansion Pilot Program at page 17 (February 10, 2017).

<sup>8</sup> Proceeding on Motion of the Commission in Regard to Gas Planning Procedures, Order Instituting Proceeding, New York Public Service Commission, Case 20-G-0131 at page 7 (March 20, 2020).

<sup>9</sup> Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning, Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning, California Public Utilities Commission, R20-01-007 at page 2 (January 16, 2020).

CECP. In that light, EDF offers the following comments and the attached report, Aligning Gas Regulation and Climate Goals: A Road Map for State Regulators (“Report”).<sup>10</sup>

## I. Overview of EDF’s Report

EDF’s Report identifies policy principles to assist state utility commissions in developing a process to help ensure that the various proceedings brought before commissions by any given local gas distribution company are all reviewed with the same lens -- decarbonization of the natural gas system while ensuring continued safe and reliable service. A few examples include:

- 1. Encourage Broad Engagement and Consider Equity Input & Impacts<sup>11</sup>** – All residents of Massachusetts, including disproportionately impacted communities, should have a voice in the development of the Commonwealth’s clean energy future. The importance of taking equity into consideration is discussed in both the MA Roadmap<sup>12</sup> and the CECP.<sup>13</sup> Specifically, the MA Roadmap states that “broad and sustained public engagement” is necessary to avoid inequitable outcomes and will be a key step in reaching the Commonwealth’s climate goals.<sup>14</sup> The DPU should consider how to maximize public participation in all of its proceedings and remove barriers to participation from stakeholders not historically represented in Commission proceedings. Additionally, the DPU should prioritize environmental and energy justice into its regulatory decision-making and invite equity experts to provide their input.
- 2. Define the True Needs of the System<sup>15</sup>** – Existing processes continue to assume year-over-year gas sendout and encourage gas expansion.<sup>16</sup> Without a more holistic examination of such processes along with the underlying policies and programs, it is difficult to determine how much new infrastructure is truly needed and the appropriate useful life for such infrastructure. In light of the Commonwealth’s initiatives to achieve zero net GHG emissions by 2050, demand expectations must reflect the true needs of customers.
- 3. Coordinate Near-Term Decisions and Long-Term Goals<sup>17</sup>** – The MA Roadmap acknowledges that there are risks and challenges in implementing even a controlled or

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<sup>10</sup> Natalie Karas et al., *Aligning Gas Regulation and Climate Goals: A Road Map for State Regulators*, EDF (Jan. 2021), <http://blogs.edf.org/energyexchange/files/2021/01/Aligning-Gas-Regulation-and-Climate-Goals.pdf> (EDF Report) (attached to this letter).

<sup>11</sup> Report at pages 13-14.

<sup>12</sup> MA Roadmap at page 7.

<sup>13</sup> Interim Clean Energy and Climate Plan for 2030 at pages 10-11.

<sup>14</sup> MA Roadmap at page 17.

<sup>15</sup> Report at page 16.

<sup>16</sup> See, e.g., Boston Gas Company/Colonial Gas Company d/b/a National Grid; D.P.U. 18-148 November 1, 2018 through October 31, 2023 Long-Range Resource and Requirements Plan at p5.

<sup>17</sup> Report at pages 24-36.

planned exit from widespread, primarily residential, use of the gas system supply.<sup>18</sup> Further the MA Roadmap states that “[i]t is important to note that gas use continues in some quantity across all Net Zero pathways.”<sup>19</sup> Therefore, the question is how natural gas can best facilitate clean energy integration and how to ensure investment in natural gas infrastructure will be consistent with the Commonwealth’s 2050 climate objectives. The DPU currently makes a wide range of near-term decisions about gas utility operations, infrastructure, and rates. These decisions should be made in a coordinated, transparent manner and should be evaluated for consistency with long-term plans and state climate goals.

4. **Institute a Robust, Transparent Gas Supply Planning Process**<sup>20</sup> – Building on the utilities’ initial long-term visions and subsequent stakeholder input and DPU Commission review, the DPU should require updates to its forecast and supply plan process. For example, to ensure gas regulation aligns with climate goals, each gas utility could submit a long-range plan that sets forth projections of demand by peak hour and hourly demand curve projections, with a corresponding list of each supply or non-supply resource by cost and projected load factor utilization, and information on non-pipeline solutions considered and not considered. The long-term plan should also include:
  - a. information to allow for comparison among resources considered and selected utilizing the All-In Cost metric;<sup>21</sup> and
  - b. an assessment of the life-cycle greenhouse gas emissions of the resources considered and selected for the supply stack;<sup>22</sup>

## II. Conclusion

Climate science and ambitious climate goals—such as those that form the basis for the CECP and the MA Roadmap—create an imperative to immediately eliminate or reduce greenhouse gas emissions to a small fraction of what they are today. To help achieve that objective, the DPU should initiate a companion proceeding to DPU 20-80 to address a holistic approach regarding the planning processes of local gas distribution companies. In such a proceeding, the recommendations detailed in EDF’s Report should be incorporated to ensure that gas planning standards are aligned with what is envisioned in the CECP, the MA Roadmap, and additional Massachusetts climate policies. The Commonwealth must develop a process to ensure that Massachusetts’ gas utilities plan responsibly for decarbonization and contraction of the natural

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<sup>18</sup> MA Roadmap at page 51.

<sup>19</sup> Id.

<sup>20</sup> Report at page 18.

<sup>21</sup> Id. at page 19.

<sup>22</sup> Id. at page 22. The New York Public Service Commission Staff recently acknowledged the importance of incorporating a life-cycle greenhouse gas emission assessment into gas supply planning: “calculating and reporting the emissions of greenhouse gas associated with all solutions, both supply-side and demand-side, is necessary for transparency when considering choices among alternative solutions.” *Proceeding on Motion of the Commission in Regard to Gas Planning Procedures*, Case 20-G-0131, Staff Gas System Planning Process Proposal at page 26 (February 12, 2021).

gas distribution system, while ensuring continued safe and reliable service and working to reduce historic inequities in the energy system.

Respectfully,

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Finding the ways that work



## **Aligning Gas Regulation and Climate Goals**

A Road Map for State Regulators

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January 2021



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### *Environmental Defense Fund*

Environmental Defense Fund is dedicated to protecting the environmental rights of all people, including the right to clean air, clean water, healthy food and flourishing ecosystems. Guided by science, we work to create practical solutions that win lasting political, economic and social support because they are nonpartisan, cost-effective and fair.

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# Executive Summary

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Reduction in the usage of natural gas is critical to mitigate climate change. When combusted, natural gas usages can vary from home heating and cooking to large industrial processes to fuel for electric generation. While many states have adopted greenhouse gas (GHG) emissions targets and are conducting long-term planning for the transition away from natural gas, retail gas utilities and their regulators have generally continued to operate in a business-as-usual framework assuming static or increased natural gas usage. In most states, there is a lack of reconciliation between these two policy objectives. This paper presents recommendations for State Public Utilities Commissions (Commissions) and other regulators to align decision making regarding gas utility operations, rates and infrastructure with climate goals to drive reductions in GHG emissions. While this paper primarily focuses on states that have enacted climate laws, the recommendations are equally relevant for states without such laws, as they ultimately serve to improve regulatory oversight, protect customers from unnecessary costs, and support continued provision of safe, reliable and affordable service in an evolving industry.

The conversations on the future role of gas utilities often focus on the choice between alternative fuels such as biomethane or hydrogen or substitutes away from the gas system, including electrification. That framing overlooks the immediate need to address existing — and in most instances outdated — policies, programs and processes that lead to continued, and often unchecked, investments in the gas system. These policies, programs and processes determine how much gas is claimed to be needed for the system, how much new and existing infrastructure is required to supply that gas, which resources will meet those needs and who will bear the costs of those resources. Revisiting and refining these existing policies in the context of the current climate goals is a foundational step to decarbonization. Considering the main users of the gas system during this transition, changing energy demand and utilization patterns, and the equity of the transition itself, is critical.

This disconnect is already resulting in large amounts of ratepayer money being committed to new infrastructure based on an assumed useful life of 60 years or longer. While this time frame might have been appropriate in a pre-climate mitigation paradigm, the mismatch between the time horizon of these new investments and climate goals exposes both gas utilities and their customers to new risks of under-collecting or even needlessly stranding infrastructure. As states achieve their climate goals, infrastructure once deemed to be used and useful may no longer be necessary for the same operation of the system, and that transition will accelerate over the next decade depending on the speed of electrification of the end uses of the gas system.

Furthermore, increasing rates resulting from stranded assets creates the potential of a utility death-spiral effect, where higher rates lead customers to electrify more quickly and raise the rates for remaining customers even more. This places the greatest impact on low-income ratepayers, who are least able to make the up-front investments required to electrify but who are the most affected by higher utility bills.

The recommendations in this paper are based on several years of EDF's experience engaging in specific gas regulatory proceedings across the country. They are also informed both by pilots and other early-stage activities underway in certain states as well as by analogous activities in retail electric utility regulation. In addition to proposing improvements to processes and planning requirements, this paper describes a number of new activities that regulators and gas

utilities could undertake or explore as part of the energy transition. This paper is not intended to describe every potential transitional program, nor will every activity described make sense in every jurisdiction.

Commissions can close the gap between state climate goals and gas utility actions and put their states on a path to meet their goals and avoid wasteful investments by taking the following three steps:

**First**, establish inclusive and transparent decision making. Gas utilities tend to make major investment decisions on a case-by-case basis, in rate and capital expenditure proceedings, which by their nature are inadequate to address systemic issues and long-range planning. On top of this, in many states, the regulatory approval of gas utility requests remains opaque and inaccessible to many stakeholder groups. By clarifying the existing approval processes, ensuring utilities provide sufficient information upon which to make a decision and encouraging broader stakeholder engagement, including from disproportionately impacted communities, regulators will provide greater visibility into, and confidence in, the regulatory process as well as enable joint problem solving.

**Second**, require rigorous long-term planning. Current forecasting and planning exercises performed by gas utilities are often limited to short duration terms, such as five- or 10-year periods, whereas the most aggressive state climate goals often are for more than 20 years in the future. By requiring gas utilities to engage in holistic and transparent long-term planning that includes an assessment of GHG emissions and evaluates a broad range of possible actions and solutions, regulators will ensure gas utilities' investment and supply decisions will not interfere with attainment of climate objectives. Even in states that have near-term climate goals (i.e., 2030), long-term planning is important for utilities as state climate plans are developed or extended and federal climate targets are adopted. This long-term planning will reduce the potential for stranded assets and ensure adequate cost allocation for any new investments that need to be made to the system to ensure safe and reliable service.

**Third**, coordinate near-term decisions and long-term goals. Commissions currently make a wide range of decisions about gas utility operations, infrastructure and rates. These decisions are often made in silos with limited transparency about how one decision impacts the other, leading to a sub-optimal outcome with respect to both customer cost and long-term system planning. By making these decisions in a coordinated, transparent manner and evaluating them for consistency with long-term plans and climate objectives, regulators will protect against unneeded investments that could result in the imposition of stranded costs.

The following page includes a synthesis of our recommended actions under each of these three categories to align gas regulatory policy and climate goals. Within each of these three broad categories, EDF provides a set of specific, actionable recommendations.

Step 1: Establish Inclusive and Transparent Decision Making	Step 2: Require Rigorous Long-Term Planning	Step 3: Coordinate Near-Term Decisions and Long-Term Goals
<ul style="list-style-type: none"> <li>• Review and Clarify Existing Processes</li> <li>• Ensure Utilities Provide Sufficient Information in Support of Requests</li> <li>• Encourage Broader Stakeholder Engagement</li> <li>• Consider Equity Input and Impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Require a Long-Term Vision Aligned with Climate Targets and Other State Policies</li> <li>• Define the True Needs of the System</li> <li>• Plan for Projected Utilization Changes</li> <li>• Conduct Robust, Transparent Gas Supply Planning</li> <li>• Evaluate Resources Using the All-in Cost Metric</li> <li>• Integrate Non-Pipeline Alternatives into Long-Term Planning</li> <li>• Establish a Gas Investment Priority Order</li> <li>• Conduct Thorough GHG Assessments</li> <li>• Ensure Gas and Electric Utility Coordination</li> </ul>	<ul style="list-style-type: none"> <li>• Connect Long-Term Planning to Cost Recovery</li> <li>• Identify Changes to Existing Programs that Incent Gas Use and Expansion</li> <li>• Design Targeted Non-Pipeline Alternative Programs</li> <li>• Link Shareholder and Societal Value</li> <li>• Align Depreciation Schedules with Climate Targets</li> <li>• Evaluate Cost Allocation</li> <li>• Explore New Tariff Services</li> <li>• Scrutinize Affiliate Transactions</li> <li>• Consider Pilots to Test Innovation</li> <li>• Review Pipeline Replacement Programs and Surcharge Mechanisms</li> <li>• Deploy Advanced Leak Detection and Data Analytics</li> <li>• Review Lost and Unaccounted for Gas Mechanisms</li> </ul>

While it may not be feasible to implement all of these recommendations simultaneously, a crucial first step in many jurisdictions will be to establish a holistic gas planning docket and require gas utilities to make thorough and transparent filings identifying current planning activities. Commissions should also identify the process for development and review of long-term plans aligned with state climate goals. By enhancing transparency and review of gas utility long-term gas plans and holding utilities accountable to decisions made in accordance with those plans, Commissions can ensure that the gas system continues to operate in a safe, reliable and affordable manner while placing gas utilities on a pathway to meet climate goals and protecting customers from unnecessary investments.

This paper first sets forth an overview of the climate science driving the need for changes to traditional gas utility regulation, jurisdictions that have adopted climate laws, and state policy and utility programs that incentivize gas use and infrastructure buildout. It then presents recommendations for transparent, equitable and inclusive decision making. The paper next details how long-term planning can be enhanced to better serve climate goals. Finally, the paper explains how near-term decisions must be measured against those long-term plans to ensure that regulatory approval and rate authorization will not interfere with attainment of GHG emissions goals.

# Background

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Recent findings in climate science — such as an understanding of the short-term climate forcing effects of methane — have made clear the need for regulation that is consistent with achieving swift and dramatic reductions in emissions associated with natural gas. Consistent with these science-based findings, many states have adopted climate goals that require substantial reductions in GHG emissions over the coming decades.<sup>1</sup> However, in most states, gas utility planning and operations have remained disconnected from these requirements and have continued to operate under traditional regulatory paradigms. In fact, many of these states continue to allow and even incentivize expansion of gas service to new customers and continued build-out of gas infrastructure. Left unaddressed, states will be challenged to meet their climate goals and customers could be saddled with unnecessary costs of infrastructure for decades to come.

When considering the future role of gas utilities in a decarbonized economy, it is important to consider the end uses of the gas system and how each end use must be decarbonized. The three major users of the gas system include: 1) residential and small business heating and cooking; 2) electric generation; and 3) large non-core customers, including industrial customers and large commercial customers. The projected decarbonization of each of these sectors will shift the usage of the gas system in unexpected ways. Without proper coordination, gas utilities could be left with either stranded assets or inequitable cost allocation among their customers.<sup>2</sup>

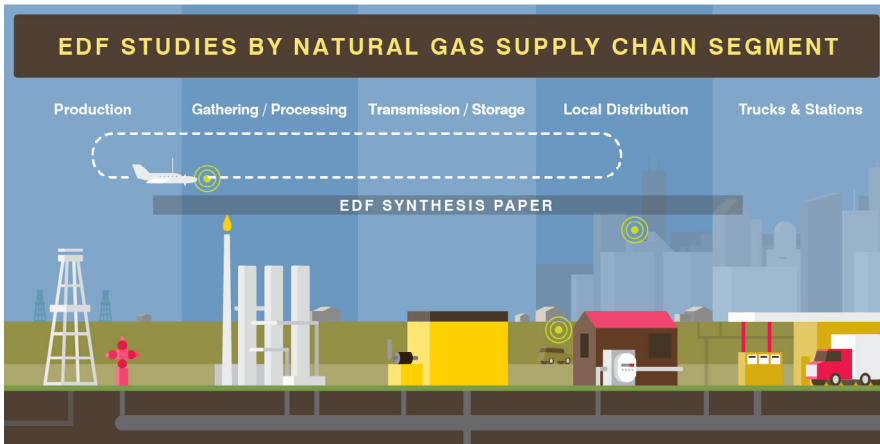
## Climate Science

The production, transmission, distribution and use of natural gas causes GHG emissions that contribute to global warming, as well as other forms of pollution.<sup>3</sup> Not only does the combustion of natural gas result in the release of carbon dioxide, leakage of natural gas before it reaches the final customer results in the release of methane, a potent GHG. Climate science firmly indicates that carbon dioxide emissions and methane leakage from the gas system contribute to climate change on a significant scale.

Methane is the principle component of natural gas, and when released without being burned, such as through leakage, is a potent GHG that traps 86 times more heat than carbon dioxide over the first 20 years after it is released into the atmosphere. As a result, methane emissions increase global warming significantly in the near-term, potentially accelerating the onset of major climate change impacts.<sup>4</sup> Methane emissions are responsible for 25% of current global warming.<sup>5</sup>

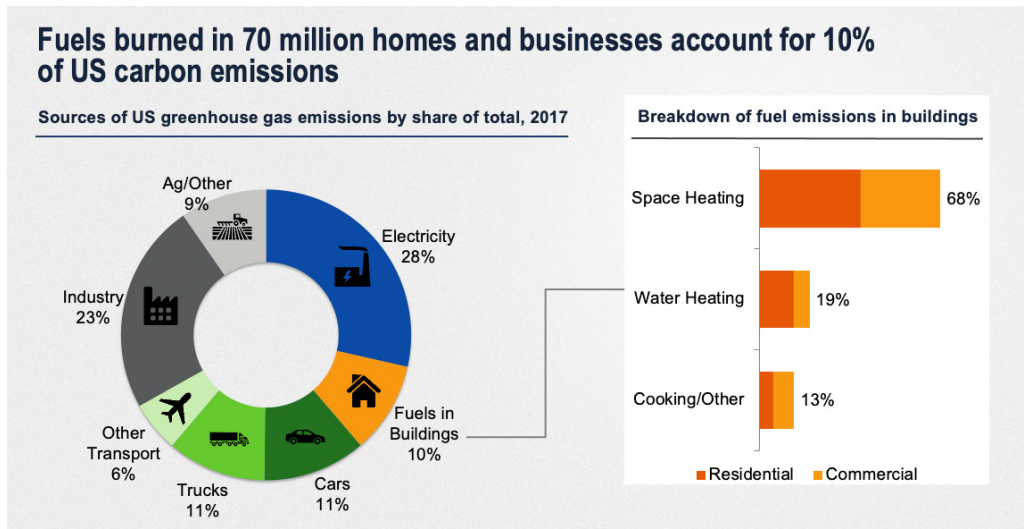
Despite a broad awareness of the harmful impact of methane emissions on the global climate, emissions of methane are significant across the natural gas supply chain. For example, a 2018 nation-wide synthesis study by EDF found that emissions of methane across the entire supply chain of the U.S. oil and gas system (from production to end use) are 60% higher than previously reported by the U.S. Environmental Protection Agency.<sup>6</sup>

**Figure 1: EDF Studies by Natural Gas Supply Chain Segment**



In addition, natural gas is a fossil fuel that, when burned, releases carbon dioxide. Across the U.S., combustion of natural gas for heating and cooking in buildings produces 466.3 million metric tons of carbon dioxide every year, or about 10% of total U.S. carbon emissions. These emissions have been growing as commercial space increases 2.1% annually and 1.4 million new homes are built every year. The following chart shows the carbon emissions from the residential and commercial sectors.

**Figure 2: Carbon Emissions Sources, Referencing 2017 U.S. EPA GHG Inventory**



Source: Rocky Mountain Institute, based on EPA Greenhouse Gas Inventory, 2017 (excludes land use, land use change, and forestry); EIA Residential Energy Consumption Survey (RECS), 2015

In sum, the climate science further highlights the need for regulation of gas utilities to be undertaken in a manner that is consistent with achieving dramatic, and rapid, reductions in GHG emissions associated with natural gas — especially in light of the short-term climate forcing effects of methane.<sup>7</sup>

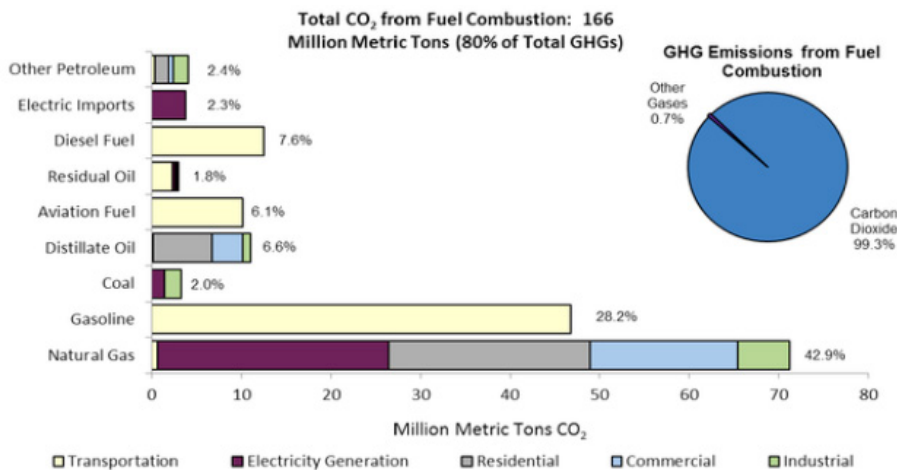
## Climate Goals

Climate change policies relevant to state utility regulation are entering into effect at various levels of government in the United States. Currently, 25 states, the District of Columbia and Puerto Rico have established GHG emissions targets.<sup>8</sup> While the targets can vary in scope (e.g., cover all GHG emissions or specific gases) and coverage (e.g., sector-specific or economy-wide), all aim to reduce emissions to a specific amount by a date certain. For instance, the Climate Leadership and Community Protection Act (CLCPA) mandates that the State of New York adopt measures to reduce state-wide GHG emissions by 40% by 2030 and 85% by 2050 (from 1990 levels), with an additional goal of achieving net zero emissions across all sectors of the economy by 2050.<sup>9,10</sup> Numerous other states, including California, New Jersey, Massachusetts, Maine, Connecticut, Colorado, as well as the District of Columbia, have enacted similar goals.

President-elect Biden is committed to a target of net zero emissions and a 100% clean energy economy by 2050, and to rejoining the Paris Climate Agreement on Day 1 of his incoming administration.<sup>11</sup> These commitments and additional forthcoming policies from the Biden-Harris administration can be anticipated to affect the plans and operations of gas utilities. Local governments in the United States are also adopting climate commitments that can affect utility planning.<sup>12</sup>

Achieving economy-wide climate goals will require massive transformation across all sectors. While much focus has been given to reductions needed in the electric and transportation sectors, deep reductions will also be required in GHG emissions attributable to gas utilities. Rhode Island’s state roadmap acknowledged that “even if all non-heating sectors were to become completely emissions-free by 2050, the heating sector would still need to be significantly decarbonized to meet the current GHG emissions reduction goals.”<sup>13</sup> In California, building usage accounts for approximately 25% of the state’s GHG emissions.<sup>14</sup> An analysis of New York’s GHG inventory yields similar results — even if all gas combustion with the exception of residential consumption were to stop, gas combustion by residential customers alone would exhaust more than half of the 2050 carbon budget of approximately 35 million metric tons, as shown in the chart below.<sup>15</sup>

**Figure 3: New York GHG Inventory, Shown as an Example of Gas Combustion in Relation to Overall State Goals**

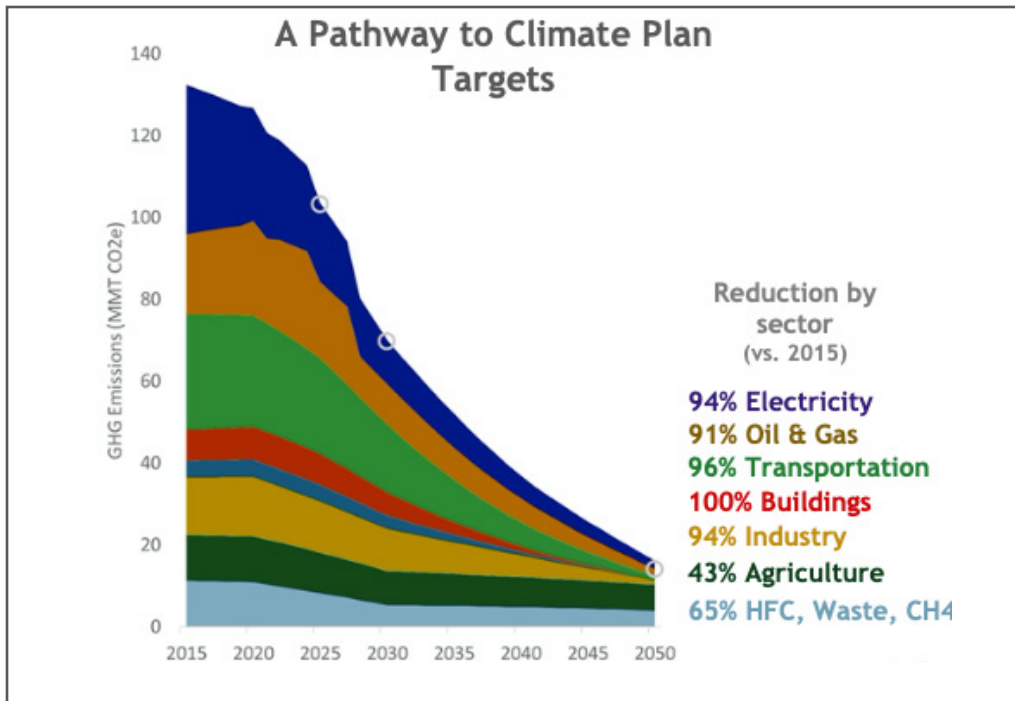


Source: New York State Energy Resource and Development



In Colorado, environmental regulators project that emissions associated with buildings will need to be reduced by 100% in order to achieve climate goals, as shown in the chart below.<sup>16</sup>

**Figure 4: Colorado Pathway, Showing an Imperative to Reduce GHG Emissions from Buildings to Achieve State Climate Goals**



Source: Colorado Air Quality Control Commission

Such projections will have profound consequences for gas utilities and demand new regulatory frameworks, tools and solutions to address these challenges.

## Incenting Gas Use and Infrastructure Buildout

At the same time that several jurisdictions have promulgated aggressive GHG reduction goals consistent with science-based targets, the policy framework relating to gas supply, use, planning, expansion, cost recovery and review has remained static. These older policies and frameworks were adopted when gas was viewed as a cost-effective and cleaner alternative to fuels such as oil and kerosene, when its environmental downside was unknown or unacknowledged, and when climate science was less clear on the degree of reductions needed to avoid dangerous levels of warming. For instance, the New York Public Service Commission's 2012 Policy Statement on natural gas is still a significant driving force in the New York State Department of Public Service (DPS) staff's review of utility gas supply plans — where utilities are asked to detail all expansion projects, and if there are none, how this is justified “given the Commission's stated goal of expanding the gas system in New York State.”<sup>17, 18</sup> In 2017, the Massachusetts Department of Public Utilities approved a gas expansion program, noting that it “is reasonably designed to increase the availability, affordability, and feasibility of natural gas service for new customers.”<sup>19</sup> In the decade since the 2010 gas pipeline explosion in San Bruno, California has authorized extensive major new investment in the gas system for safety enhancements without reconciling such approval with its 2006 climate change laws.<sup>20</sup>

Against this backdrop, utilities continue to rely on business-as-usual scenarios, assumptions and programs. They propose gas capital projects and programs costing billions of dollars, project year-over-year growth on their systems, and assume 80 year lives for gas mains and 60 year lives for services.<sup>21,22,23</sup> Some gas utilities, in concert with their affiliate pipeline developers, have proposed massive new greenfield, interstate pipelines. Ratepayers are asked to pay for these investments for decades to come, without consideration of the climate objectives.<sup>24</sup> Meanwhile, recovery of opaque gas costs — through purchased gas adjustment mechanisms or various infrastructure surcharges — is often viewed by regulators as “rote” and remains disconnected from any long-term planning or GHG analysis.

Further compounding the challenge is the fact that there are few, if any, financial mechanisms to adequately reward gas utility shareholders based on early retirement of assets, avoidance of capital investment through non-pipeline alternatives, or incorporation of other decarbonization strategies into their business models. Decarbonizing the end uses of the gas system will require prudent management; there is a fundamental misalignment between shareholder interests and public policy. Regulators must consider new ratemaking approaches and tools — employing a “business-as-usual” approach to gas utility oversight will only serve to hinder achievement of climate goals. Before climate regulation was enacted, shareholder interests were aligned with the prudent management of the system, which included the ability to earn profit on expenditures for safe operations and expansion to new customers. Now regulators need to align shareholder interests with prudent management of the *contraction* of the system and other ways to decarbonize it, in addition to ensuring continued safe and reliable service. Fewer customers, less throughput and increasing risk all need to be considered.

Regulatory oversight must keep pace with evolving market and legal developments. While several existing laws permit, if not compel, Commissions to perform their public service responsibilities with due consideration of climate change, these provisions have not been activated with any great force in gas rate cases to date.<sup>25,26</sup> That said, several leading Commissions have taken the important first step of opening broad, state-wide proceedings to evaluate the future role of natural gas and how best to reconcile their climate goals with existing gas utility policies and business models. Governing in this new era will require both procedural changes, such as more inclusive proceedings with opportunities for robust stakeholder input, and substantive ones, such as enhanced regulatory oversight to protect against the threat of significant stranded assets. Below are recommendations that Commissions can follow to begin to bridge the disconnect between gas policy and climate commitments.

# Inclusive and Transparent Decision Making

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Gas utilities tend to make major investment decisions on a case-by-case basis, in rate and capital expenditure proceedings, which by their nature are inadequate to address systemic issues and long-range planning. On top of this, in many states, the regulatory approval of gas utility requests remains opaque and inaccessible to many stakeholder groups. Depending on the state and the particular process, decisions may happen behind closed doors based on brief summary documents or may happen in public proceedings that are only open to certain types of participants. Often times these decisions happen in disconnected silos without clear notice to potentially impacted stakeholders. Approval of unnecessary new infrastructure can adversely impact low-income and disproportionately impacted communities, who can least afford rate increases.

Commissions should make the decision making processes for gas utility activities more transparent and accessible to all stakeholders. Furthermore, these processes should include detailed evaluation of the impact of potential actions on disproportionately impacted communities as well as the environmental and energy justice implications of any approvals.

## Review and Clarify Existing Processes

A natural starting place to refresh regulatory tools is a review of the state's various gas processes and proceedings to identify gaps, deficiencies and potential linkages. Commissions regulate gas utilities through several types of proceedings, including rate cases, forecast and supply plans, and purchased gas adjustments, among others. Narrowly reviewing utility filings in each of these silos fails to capture the incremental economic and environmental impacts of each approval. Furthermore, the separation of decision making related to gas utilities into multiple, separate proceedings without clear linkages or appropriate cross-proceeding notice can pose a barrier to participation by non-utility stakeholders and members of the public. Several Commissions have already recognized the need to open broad, umbrella policy proceedings to address the future role of gas and gas utility viability.<sup>27</sup> This type of holistic inquiry can begin to address the deficiencies of the current piecemeal review as well as identify the challenges associated with maintaining necessary infrastructure to support and ensure a workable transition.

Existing processes should also be reviewed to determine important linkages. As one example, the recovery of gas costs — whether in a rate case or through a purchased gas adjustment mechanism — is not conditioned on, and generally is not even reviewed for consistency with, filings in long-term gas planning dockets. Linking these two efforts could provide an important means of holding utilities accountable for their decisions and protecting customers from unnecessary rate increases. Other improvements, such as advance review of certain costs, could also provide benefits, including assurance of cost recovery and reduction in the number of litigated issues. For instance, a Rhode Island planning protocol provides that the gas utility will seek advance approval through a filing and proceeding at the Commission for long-term commitments that meet certain triggering criteria.<sup>28</sup>

## Ensure Utilities Provide Sufficient Information in Support of Requests

While it is well established that the utility bears the burden of proof to demonstrate its costs are just and reasonable, many filings simply contain a few sparse tariff sheets, without any meaningful demonstration of how those rates were calculated.<sup>29</sup> Utilities sometimes omit critical information from these filings, such as when they fail to disclose an affiliate relationship between a pipeline developer and a retail gas utility customer.<sup>30</sup> These deficiencies, in effect, shift the burden from the utility to customers and intervenors to demonstrate why a proposal should not be approved, as opposed to why it *should* be approved.

New infrastructure investments often require the granting of a Certificate of Public Convenience and Necessity, which requires a finding that the investment is reasonable, prudent and in the public interest. Regulators must view the “used and useful” standard in light of climate goals. This may require requesting additional information, opening companion investigation proceedings, or being willing to deny projects without prejudice until the utility meets its burden of proof.

These evidentiary deficiencies can be compounded by the absence of any meaningful pathway or forum to address requests for heightened scrutiny of gas contracts.<sup>31</sup> For example, in New York, EDF has been waiting for more than three years to obtain clarity for the appropriate forum to review a disputed affiliated transportation contract.<sup>32</sup> Commissions can resolve these challenges by ensuring that processes and proceedings for review of gas costs and new infrastructure are subject to clear and transparent requirements, responding to requests for heightened review of particular transactions, and ensuring that utilities provide sufficient information upon which to make a reasoned decision.

## Encourage Broader Stakeholder Engagement

Gas utility dockets were designed primarily with a limited set of stakeholders in mind — Commission staff, the state consumer advocate and perhaps a small subset of sophisticated customers. Generally, a state’s consumer advocate typically limits its representation to a generic residential customer profile and does not exclusively represent frontline communities, low-income customers or other vulnerable stakeholders. In the past, some Commissions have denied intervention or full party status to environmental groups in certain proceedings.<sup>33</sup> Commissions should ease limitations on intervenor participation in formal proceedings and consider new structures and approaches to stakeholder involvement in order to invite a broader swath of input, such as community public participation hearings, and should ensure that these approaches facilitate stakeholder participation in all decision making, not just during rate cases. For example, the California Public Utilities Commission (CPUC) created a program (later adopted and expanded by the state legislature) to give financial resources to intervenors who face a significant financial hardship and make a substantial contribution to the record. The state also provides for community public participation hearings and solicits correspondence through community groups and includes that information in the record of the proceeding.<sup>34</sup> In general, proceedings benefit from more inclusivity to enable joint problem solving including quality outreach to, and public participation from, disproportionately impacted communities.<sup>35</sup>

Commissions should also ensure that other state regulators with overlapping or otherwise related jurisdiction are aware of, and have the opportunity to engage in, relevant proceedings. In

many states, multiple regulatory bodies have responsibilities for, or related to, achievement of state climate goals.<sup>36</sup> To the extent that decisions made in Commission proceedings impact the pathway to achieving those climate goals and the remaining potential carbon budgets for other resource types, coordination between regulators is important.

## Consider Equity Input and Impacts

The existing regulatory construct does not provide for adequate consideration of equity in processes or decisions. While there is increased understanding of the importance of equitable outcomes, that has, to date, rarely resulted in meaningful changes to the process, let alone decisions impacting gas investments. Disproportionately impacted communities face greater energy burdens (spending a higher proportion of their income on energy bills), environmental burdens (experiencing greater exposure to pollution from energy infrastructure) and infrastructure burdens (living in areas with older housing stock). It is imperative to invite, encourage and enable participation in the regulatory process from disproportionately impacted communities, and to consider equity in all regulatory decisions. There is no one-size-fits-all approach for enabling equitable participation and ensuring equitable decisions in every jurisdiction. Disproportionately impacted communities are integral to the conversation and their perspectives must be included at the outset. Right now, in this nascent stage of transforming the regulatory construct, it is imperative to embed equity in the process of developing regulatory reforms. The considerations below are not exhaustive and local organizations must be consulted in developing any reforms.

As an initial matter, regulators and stakeholders should consider barriers to participation from stakeholders not historically represented at Commission proceedings. These include, but are not limited to, requiring in-state counsel for participation; requiring live, in-person participation; and addressing economic barriers to participation. Some options for addressing these barriers include providing compensation to organizations for whom participation creates an economic hardship; reforming requirements of retaining in-state counsel when doing so presents a hardship; gathering stakeholder feedback through workshop processes with a lower barrier to participation; and enabling virtual participation.

In addition to increased equity in regulatory procedures, environmental, energy and climate justice must be high-priority considerations in regulatory decisions. Tools such as the Initiative for Energy Justice's Equity Scorecard could be deployed to help assist Commissions in evaluating the equity implications of various proposals.<sup>37</sup> Equity experts should be invited to present on how issues of environmental and energy justice should be considered by Commissions and stakeholders.<sup>38</sup> For example, in California, prominent equity groups authored "Equitable Building Electrification: A Framework for Providing Resilient Communities" which presents a five-step framework for how the current goals of building electrification can be aligned with producing healthy homes, creating high quality, local jobs, and establishing stronger connections between everyday Californians and our climate change policies and goals.<sup>39</sup>

One area of particular concern should be rate impacts on disproportionately impacted communities. Households that can least afford increases should be explicitly considered, along with alternative rate options, where appropriate, for those households.<sup>40</sup> Households of all income levels should be able to participate in demand response and energy efficiency programs and renters should have the same opportunities as homeowners.<sup>41</sup> Low-income households face unique challenges that must be considered. See "Consider Pilots to Test Innovation" section below for recommendations on pilot projects that ensure equitable access.

These same communities tend to be unable to afford to electrify their homes or lack the site control to make these capital improvements because they are renters. That means that as wealthier customers depart the system to electrify and become early actors to meet the state's decarbonization goals, these same disproportionately impacted communities will be left “holding the bag” on the existing gas system costs. Absent policy intervention, spreading the same costs out over fewer customers will lead to a rate increase that will be unaffordable, with disproportionate impact on these communities. Without policy action, regulators are in danger of creating a highly regressive customer cost recovery system. Regulators will need to thoughtfully consider the existing financial obligations of the gas system and manage its contraction so that these critical equity considerations will be taken into account. Using metrics such as remaining book value, expected useful life and depreciation schedules will be critical for considering how to prudently manage the decarbonization of the end uses of the gas system.

# Long-Term Planning Requirements

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A necessary first step to harmonize the activities of gas utilities with climate goals is for gas utilities to conduct forecasting and planning activities that match the tenor of those goals and consider the system changes that will be necessary for achievement of those goals. Current forecasting and planning exercises performed by gas utilities are often limited to short duration terms, such as five- or 10-year periods, whereas the most aggressive state climate goals often are for more than 20 years in the future. In addition, gas planning often narrowly focuses on meeting peak usage and demand needs, which are usually forecasted to be static or growing based on dated assumptions and policies. To the best of our knowledge, no Commission has successfully completed a long-term gas planning docket that aligns with that state's climate goals.<sup>42</sup>

Commissions should require gas utilities to engage in holistic and transparent long-term planning that includes a consideration of consistency with state climate goals and evaluates a broad range of possible actions and solutions. This long-term planning should look beyond just a five-year or 10-year time horizon and determine how gas utilities can support achievement of end use decarbonization, as reinforced by state climate goals. Furthermore, the long-term plans should consider a broad range of possible actions, coordinated solutions and attendant transformations of business models. Gas utilities' long-term plans should be evaluated through a transparent and open public process with participation from a diverse group of stakeholders.

## Require a Long-Term Vision Aligned with Climate Targets and Other State Policies

As a starting point for review and discussion by stakeholders, Commission staff and ultimately Commissions, gas utilities should be required to present a vision for how their business model will evolve to support and serve climate goals. While traditional planning efforts generally consider shorter-time frames (e.g., five to 10 years) and often narrowly focus on the sufficiency of capacity, this longer-term approach would consider all tools available to retail gas utilities to reduce GHG emissions across their systems and achieve state climate compliance. A long-term vision can help to identify regulatory barriers that may be specific to the jurisdiction and elucidate any disconnects between climate requirements and the expectations and long-term vision of other agencies and stakeholders. A holistic picture of a company's system can also identify low-hanging fruit to be addressed in the near term, such as through aggressive methane leak mitigation. One example of such a plan is Washington Gas Light Company's (WGL) Climate Business Plan.<sup>43</sup> Although parties have critiqued several aspects of WGL's Plan, it has served as a basis to elucidate the disconnect between the vision of the gas utility and other interested stakeholders.<sup>44</sup> Since natural gas infrastructure is inherently long-lived, alignment with this long-term vision will change the overall investment planning framework, expected useful life, depreciation schedule and workable decommissioning plans.

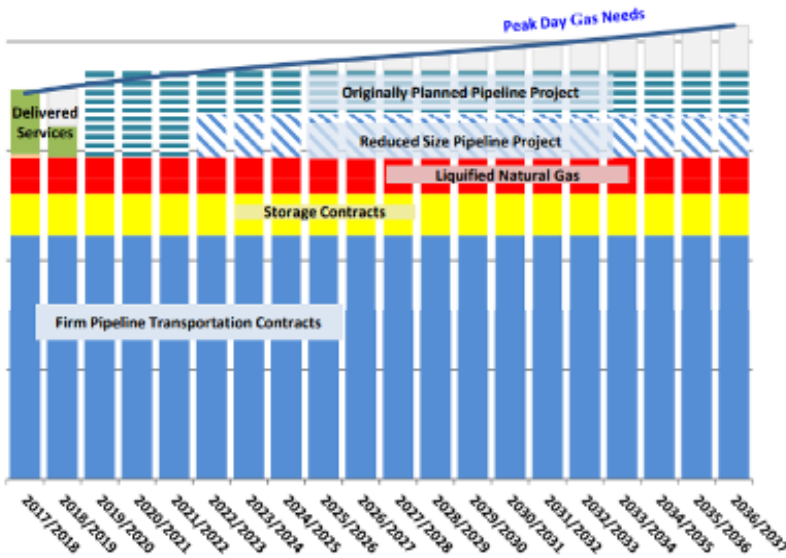
## Define the True Needs of the System

Long-term forecasts of demand have been traditionally based on assumptions developed by individual gas utilities and approved by Commissions.<sup>45</sup> In almost all circumstances, these assumptions predict that overall gas demands will either increase or stay flat. This trajectory

aligns with shareholder interests of continued use and expansion of the system. However, this may no longer reflect the true needs of the customer the system serves in light of the imperative to decarbonize energy end use.

In Massachusetts, for example, a long-range forecast and supply plan is developed over a five-year planning horizon and describes the forecasting utility’s resource planning process and strategies to meet the current forecast of customer requirements and prevailing market conditions.<sup>46</sup> Throughout the country, these long-term forecasts often project year-over-year growth, even for utilities within states that have adopted stringent GHG targets.<sup>47</sup> These projections have profound implications for new gas infrastructure buildout, as demonstrated by Consolidated Edison’s 2017 plans to develop a new pipeline to meet its projected 2037 peak day gas needs.<sup>48</sup>

**Figure 5:** Example of Con Edison’s 2017 Projection of Impacts of Future Pipeline Projects on Meeting Customers’ Needs



Source: ConEdison

A revamped forecasting framework will be needed to address the more uncertain future and incorporate likely demand changes related to climate goals. Improvements to demand forecasts could follow recommendations already being considered or implemented on the electric side, including incorporating weather impacts attributable to climate change, embedding state climate goals into the model, explicitly modeling non-pipeline alternatives, and requiring forecasts to be based on publicly available data and publicly available accessible models.

Gas utility planning should also consider what risks and impacts the effects of climate change, including sea level rise, worsening storms and wildfires, and drought, will create for gas infrastructure and projected utilization patterns. By way of comparison, recent electric utility forecasting has revealed significant potential risks to parts of the electric system; it is unclear the extent to which similar forecasting has been done for the gas system.<sup>49</sup> Analysis of these risks would reveal what actions should be taken to ensure that the gas system remains safe and reliable and what assets are particularly vulnerable, which may inform retirement, electrification and/or replacement decisions.



## Plan for Projected Utilization Changes

Beyond recognizing likely demand reductions, long-term planning should incorporate projected changes to system usage. Currently, gas distribution system demand peaks during the winter heating season, with a relatively small number of cold days driving capacity needs. Gas utility planning activities should consider whether, as heating electrification increases, the system will see peaks that are smaller not just in absolute terms but also as compared to average usage. System peak could shift from winter to other periods when gas demands may be high, changing both procurement and storage capacity needs. They may also result in a significantly larger number of customers with small and consistent usage, if some customers electrify their heat but retain gas cooking appliances. Changes in usage patterns should inform decisions about what infrastructure will continue to be necessary as overall usage decreases. Investments to maintain system pressure may be different under this scenario, especially if a percentage of customers depart the system entirely. As discussed above, more research is needed as to how customer use patterns and reliability may or will change as a consequence of climate change.

Commissions should also expect that in a gas market that is anticipated to decline over the next two decades, reliability concerns may be overtaken by deliverability concerns. Thus, the issues of greatest concern in the future may not be related to peak gas demand or cold day conditions (reliability) but instead ramping and acute, locationally-sensitive requirements for gas-fired generators (deliverability). This planning may require more robust forecasting of where gas-fired electric generators will continue to operate (establishing sensitive parts of the gas pipeline network), and when those operations are most likely to occur. In light of these dramatic changes, as Commissions evaluate issues of reliability and resilience, they should prevent over-investing and consider the expected profile of the customers who will be using the system in the future, not just the profile of today's customers.<sup>50</sup>

## Conduct Robust, Transparent Gas Supply Planning

Approaches to gas supply planning vary by state and utility. For instance, in North Carolina, Piedmont Natural Gas files historic and projected load duration curves and against such curves presents its “resource stack” of pipeline capacity and on-system supplementals (e.g., LNG and CNG) to demonstrate its resource sufficiency.<sup>51</sup> In Massachusetts, the utilities present design day demand (net of conservation and energy efficiency) against which they present their contractual and on-system resource stack and identify surplus or deficit conditions with respect to the matching of forecasted demand to contracted resources.<sup>52</sup> The New York Public Service Commission has historically not made any formal public findings regarding the sufficiency of each gas utility's supply plan, and the process is primarily an exchange between the utility and DPS Staff.<sup>53</sup> In California, gas utilities develop an annual report that forecasts supply and demand out 15 years, but that report receives no public comment and the utilities have no obligation to map them against state-wide climate targets.<sup>54</sup> Utilities and Commissions have started to recognize the deficiencies of the current approach.<sup>55,56</sup>

There are three categories of changes Commissions should consider in improving long-term traditional gas supply planning: 1) changes to the process to facilitate stakeholder participation; 2) changes to how planning is presented for Commission and stakeholder review; and 3) changes in the types of information that each gas utility should submit.<sup>57</sup> First, the process should be annual and open to a wide variety of intervenors with opportunities for discovery rights. Second, gas utilities should be required to submit long-range plans, which set forth

projections of demand by peak hour and hourly demand curve projections. Against that demand, the long-range plans would list each resource by cost and projected load factor utilization. Each utility’s approved long-range plan would become the basis for an annual gas cost reconciliation proceeding and provide the baseline for recovery. Any difference between costs proposed in the reconciliation proceeding and the long-range plan would be deemed a “variance from the plan.” Third, gas utilities should be required to provide historic and forecasted demand curves, resource stacks, including a presentation of each resource’s fixed and projected variable costs and projected load factor utilization, and information on non-pipeline solutions considered and not considered.<sup>58</sup> This presentation of potential resources, as well as their timing, annual all-in costs, and capabilities would assist Commissions and stakeholders in both understanding and evaluating the available alternatives and the trade-offs involved with each.

**Evaluate Resources Using the All-in Cost Metric**

As part of a robust gas supply plan, gas utilities should be required to present an apples-to-apples comparison of all resource options using an all-in cost per dekatherm of use metric (All-in Cost).<sup>59</sup> This metric considers the annual total fixed and variable costs of an option, divided by the projected annual use in order to arrive at a representative dollar per dekatherm (\$/Dth) benchmark cost. Below is an example.

**Figure 6:** Example of All-In Cost Metric, comparing new pipeline capacity to a Compressed Natural Gas facility

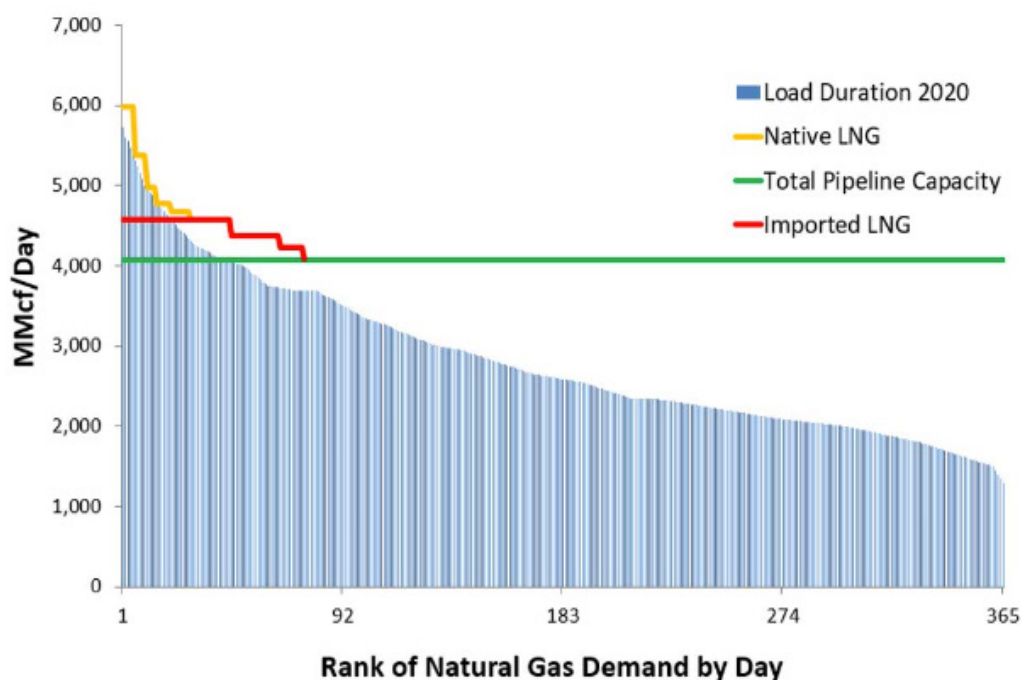
	Annual Facilities’/ Fixed Costs	Annual O&M/ Commodity Costs	Peak Hour Demand (Dth/Hr)	Annual Incremental Demand Met	All-in Cost (\$/Dth)
Ex. 1	\$5,000,000	\$1,800,000	1,000	150,000	\$45.33
Ex. 2	\$15,768,000	\$420,000	1,000	150,000	\$107.92

Ex. 1 Assumptions: Annual Cost of CNG Facility is \$5MM; CNG \$/Dth \$12  
 Ex. 2 Assumptions: Annual Cost of New Build PL Capacity at \$1.80/Dthd; \$/Dth \$2.80

Common Assumptions: 1,000 Dth/HR (24,000 Dthd); and 150 Hours/Yr Equivalent Full Use/

This type of metric is critical to weighing the cost of new long-term investment such as new pipeline capacity, which is not used on every day of the year. As shown below in the illustrative New England load duration curve, pipeline capacity constraints exist for less than 50 days of the year:

**Figure 7:** Illustrative New England load duration curve, showing pipeline constraints on approximately 50 days of the year



Solving these seasonal constraints with a pipeline solution, as compared to an alternative such as imported Liquefied Natural Gas (LNG), would come at significant cost to ratepayers. This is because the annual fixed costs of new pipeline capacity are significantly higher than alternatives such as LNG or Compressed Natural Gas (CNG). Because new pipeline capacity is not needed every day of the year, this results in a much higher all-in cost. The all-in cost metric can serve as a valuable tool in elucidating the least cost option for customers.

### Integrate Non-Pipeline Alternatives into Long-Term Planning

Non-pipeline alternatives (NPAs), which resolve gas constraints without developing large, expensive, long-lived infrastructure projects, have the potential to make gas planning more consistent with state climate goals.<sup>60</sup> NPAs are the gas equivalent of non-wires alternatives in the electric utility context, consideration of which has increasingly become accepted and even required as a part of the electric system planning process. NPAs fall into two categories: those which address peak-day constraints, such as demand response programs, CNG or LNG and those which address total annual customer demand, such as energy efficiency programs and fuel switching programs like targeted electrification. A GHG assessment for each of these options must be employed to understand overall climate impact, as some options will present zero emissions (energy efficiency) and others will present varying levels of impact (e.g., for fuel

switching to electricity, the life cycle analysis should account for all GHG emissions from electricity generation to power the replacement heat pump).

While certain frameworks for NPA suitability criteria and incentive mechanisms have been proposed, to date efforts to deploy NPAs have often been explored on a piecemeal basis and divorced from any rigorous long-term planning effort.<sup>61,62</sup> Identifying and assessing non-pipeline alternatives outside of a company’s formal planning and needs assessment will tend to limit deployment and could present missed opportunities to better align gas policy with the state’s climate goals. And without transparency and visibility into the traditional utility solution planning process, including demand projections, projected load factor utilization and the all-in costs of potential solutions, impediments to pursuing non-pipeline alternatives will remain.

As part of the long-term plan and for those forecasted demands not met by existing contract rights plus utility-operated facilities, utilities should be required to identify all potential resources — including NPAs — under consideration.<sup>63</sup> An assessment of each resource should include the resource’s all-in cost and provide the detailed analysis and assumptions underlying those costs. Where no NPA is under consideration or when NPAs have been proposed but are not being considered, utilities should also be required explain why NPAs are not under consideration and identify any specific proposed or potential NPAs that are not under consideration.<sup>64</sup>

Commissions should also consider employing a more systemized approach to comparing non-pipeline alternatives modeled after Consolidated Edison’s December 21, 2017 Request for Proposals submitted in the Smart Solutions proceeding (New York Public Service Commission Case No. 19-G-0606).<sup>65</sup> In brief, after establishing an identified need, the retail gas utility would issue a Request for Proposals, seeking a broad array of innovative solutions from non-utility third parties that could either provide gas supply or demand relief. This competitive-type process would not only protect against affiliate abuse but would also incentivize service providers to develop solutions that are narrowly tailored (in terms of size and cost) to the ultimate need while minimizing adverse impacts on communities and the environment.<sup>66</sup> As a result of this robust and competitive process, the retail gas utility would have several options to choose from and its selection process would be transparent to the Commission and interested stakeholders.<sup>67</sup>

## Establish a Gas Investment Priority Order

Regulators can facilitate long-term planning by establishing a “gas investment priority order.” This investment hierarchy serves two critical objectives: it helps align future gas utility expenditures with decarbonization goals by reducing the total amount of natural gas throughput and it accomplishes a balance between customer affordability and system reliability.

A “gas investment priority order” could be modeled on California’s Loading Order, which mandates that, in electric procurement plans, energy efficiency and demand response be pursued first, followed by renewables and lastly by clean-fossil generation.<sup>68</sup> In California, the Energy Action Plan that created the Loading Order enabled a shared vision of how new investments should occur so that regulators did not need to consider the merits of an individual utility application in a silo but rather had proper context for the new investment. The same need exists for new gas investments. Establishing this order of operations will help

manage the contraction of the gas system as decarbonization occurs. While the actions in this “gas investment priority order” may need to be adjusted depending on the jurisdiction, a long-term system plan should acknowledge the role of the following actions before turning to traditional infrastructure investment:

- Non-pipeline alternatives to optimize total customer demand, including gas energy efficiency programs and fuel switching programs such as targeted electrification
- Non-pipeline alternatives to address peak day constraints such as gas demand response programs

Related to this hierarchy, as Commissions consider new investments in the system, they should prioritize those which reduce lost and unaccounted for gas (LUAF or LAUF) through advanced leak detection technology, reprioritize repair timeframes to account for the climate harm of the leak and not just the leak’s proximity to densely populated areas, and establish appropriate incentives to prevent methane leaks. California regulators, for example, have taken these steps and that state’s PUC also found ways to align shareholder responsibility with the accounting mechanisms associated with the LUAF to further incent the elimination of leaks. These steps aligned the safe operation of the system with an environmental objective and could be replicated in other places to consider how investments could be prioritized. More detail on this is provided in the “Review Lost and Unaccounted for Gas Mechanisms” section below.

Commissions should also explore additional ways to reduce throughput expenditures, through gas trading reforms, capturing the value of investments in Advanced Metering Infrastructure technology to fashion time-of-use rates and leveraging gas storage facilities.

While the topics are still emerging, regulators should consider alternative non-fossil gases (such as biomethane or hydrogen) carefully, and reserve allocation of new infrastructure investments to support these alternative fuels for hard-to-decarbonize remaining end uses.

## Conduct Thorough Greenhouse Gas Assessments

Gas supply plans to date have largely ignored the GHG emissions impact of various supply options. In those plans that have considered environmental impact, such as National Grid’s Long-Term Capacity Report, the GHG assessment has been sparse.<sup>69</sup> Gas utilities should be required to provide a rigorous, consistent and transparent approach to evaluating the GHG implications of different gas supply options. The utilities should also assess how their plan will, or will not, affect the state’s ability to meet its climate objectives.<sup>70</sup> Such an assessment would be used in conjunction with an evaluation of the all-in cost metric described above. A robust lifecycle assessment should:

1. Account for all combustion-related GHG emissions and fugitive methane emissions at each stage (upstream, gas utility operations and end-use combustion);
2. Account for both supply- and demand-side options;
3. Use the most recent publicly available data;
4. Identify and incorporate significant uncertainties in methane leakage assumptions used to develop the life cycle GHG inventory for each option;
5. Align the analysis with economy-wide GHG emission reduction targets; and
6. Monetize life cycle GHGs using the Social Cost of Carbon Dioxide and Social Cost of Methane.

While this GHG assessment for gas supply planning is a crucial first step, ultimately gas utilities will need to provide sufficient information in order for their regulators to determine the reasonableness of all future requests. Such requests must be consistent with statewide GHG emissions limits. Broadly speaking, this would first require a comprehensive baseline of GHG emissions in each utility service territory. Once the baseline is established, the Commission would need data to assess progress towards GHG reductions, ideally on an annual basis. Finally, the utility would need to provide estimated GHG impacts from any proposal as well as projections of GHG emissions with an assessment of variability and uncertainty to determine whether such proposals will interfere with climate goals.<sup>71</sup>

## Ensure Gas and Electric Utility Coordination

Once a gas utility proposes a long-range plan which presents its supply plans in concert with its GHG emissions reductions efforts (including cost-effective electrification), it will be necessary to coordinate such efforts with the electric utility serving the same service territory. This is because electric generation profiles will be different during the decarbonization transition, and gas-fired generation profiles will be different as more intermittent renewable energy (such as solar and wind) are integrated into the electric grid. For combined gas and electric utilities, this coordination would of course occur more organically. For gas-only utilities, Commissions may need to institute more formal channels of communication between the gas-only utility and its electric utility counterpart to coordinate respective capabilities and plans. Such coordination is already occurring in some jurisdictions, such as Vermont Gas' announced partnership with the Energy Co-Op of Vermont. These utilities plan to "work together to help customers find the right low-cost, low-carbon solution for their energy needs, including non-gas alternatives such as electric cold climate heat pumps, advanced wood heat systems, and other options in support of the State's 90% renewable by 2050 plan."<sup>72</sup>

Similar coordination is also informally occurring in California between Southern California Edison and Southern California Gas Company, where ramping needs for gas-fired electric generators to help integrate solar and other variable renewable electric generation create new gas system demands in that portion of the state. In California, the coordination also involves the California Independent System Operator (CAISO) as the state's balancing authority to forecast the ramping needs of electric gas-fired generators. As discussed above, with additional electrification, the gas peak demand in some areas could shift from the winter heating season to times of high electric usage and limited renewable production, when demand by gas-fired electric generators is highest. Over time, these electric generators will probably run less frequently and gas demands will be less predictable than in previous decades. This will cause new costs on the gas pipeline network, with implications on pressure and storage requirements. States like California are considering implementing new tariffs for gas-fired electric generators to pay for these changing system costs.<sup>73</sup>

Coordination must account for issues associated with increased competition for market share, as increased electrification for heating reduces the need for gas expansion and even reduces existing gas demand. For example, California adopted a four-year \$200 million pilot program on electrification of new and existing residential buildings.<sup>74</sup> This competition will become more pronounced as electric utilities offer rebates for heat pumps and electric utilities develop beneficial electrification plans as a result of legislation and Commission action.<sup>75,76</sup>

# Coordination of Near-Term Decisions and Long-Term Goals

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Commissions currently make a wide range of decisions about gas utility operations, infrastructure and rates. These decisions are often made in silos with limited transparency about how one decision impacts the other, leading to a sub-optimal outcome with respect to both customer cost and long-term system planning. These decisions should be made in a coordinated, transparent manner and should be evaluated for consistency with long-term plans and state climate goals. In particular, decisions about building, repairing or replacing infrastructure should consider the potential long-term need for that infrastructure given climate goals. Any investment with long-term assets should include evaluation of alternatives, including non-pipeline alternatives.

In the long-term plan, Commissions can establish a “bright line” for new investments. This establishes a different ratemaking treatment for new investments, including new assumptions for expected useful life, depreciation schedules, decommissioning costs assumptions, etc. Each of these can be aligned with the dates established in the state’s climate goals. In support of this, Commissions should align ratemaking and rate design authorizations with climate policies, develop electrification and alternative technology programs or pilots, enhance scrutiny of affiliate transactions, revisit depreciation and cost allocation issues in light of the changing energy industry, and ensure that policies and programs related to leak-prone pipes are effective in reducing GHG emissions and supporting state climate goals.

## Connect Long-Term Planning to Cost Recovery

Requiring gas utilities to comply with a more robust planning framework would help manage and avert the challenges raised by rate filings that fail to demonstrate, or even consider, whether the continued and significant gas investment proposed therein are consistent with state climate goals. For example, in Consolidated Edison’s 2019 gas rate proceeding, the company proposed over 60 gas capital projects and programs that would represent approximately \$2.9 billion in investments over the course of a three-year rate plan.<sup>77</sup> Some of these projects were proposed after the initial rate filing was made and were declared necessary in order to avoid a moratorium on new customer connections.<sup>78</sup> The request raised significant questions regarding need, alternatives and consistency with climate goals — all issues that should be addressed well in advance of the time that cost recovery is sought.

Separate from rate case proceedings, several Commissions have implemented purchased gas cost mechanisms to stabilize gas costs and minimize base rate filings. These mechanisms typically include commodity-related costs as well as demand related costs (e.g., fixed transportation costs).<sup>79</sup> Some utility filings are shocking in their lack of transparency.<sup>80</sup> Others, such as the New Jersey Basic Gas Supply Service filings, glaringly omit any reference to state energy or climate goals, despite their significant implications for the long-term management of gas supply portfolios.<sup>81</sup> These deficiencies could be corrected by centering a gas utility’s decisions around a long-range plan, which would then become the basis for recovery in gas cost reconciliation proceedings. Rhode Island has provided a model for how this could work in practice, linking the gas utility’s Long Range Plan (LRP) to the annual gas cost reconciliation (GCR) filing:

The annual GCR filing will reflect the final costs and volumes that are derived from the annual LRP filings. The Company will prepare a comparison of volumes and costs presented in its GCR filing in the same form (i.e., presentation format) as its annual LRP filing from June of the same year and identify any differences. By the time the GCR is filed, these items found in the Company's LRP submission will have already been fully vetted, and the Division will only need to review any changes that have occurred in the interim or are projected by Company to occur during the upcoming GCR period, subject to the Division's right to review and dispute any costs in the GCR that were not approved in accordance with the process identified in this Joint Memorandum or otherwise.<sup>82</sup>

Planning processes must be connected to rate recovery in order to bring the necessary accountability and discipline to utility decision making in an era of rigorous climate commitments. When authorizing rate recovery for new proposals, Commissions can connect “used and useful” assumptions with climate goals to ensure that new investments are not left stranded because of these climate commitments.

## Identify Changes to Existing Programs that Incent Gas Use and Expansion

Many states and utilities have adopted policies and programs that subsidize new customer connections (both line extensions and service connection subsidies) to the gas system.<sup>83</sup> These policies create a default to gas in many geographies, which make the transparent evaluation of alternatives difficult if not impossible. These policy mechanisms were summarized in a 2017 NARUC report and include offering no-cost extensions for consumers that are located a short distance from an existing gas main or offering individual consumers the ability to finance extensions through on-bill financing surcharges or other payment plans.<sup>84</sup> Commissions also routinely approve programs which target fuel switching from propane to natural gas and pilot programs that incentivize efficient expansion of the distribution system.<sup>85,86</sup> These programs and incentives must be revisited and evaluated to determine whether their continued operation will interfere with compliance of state climate goals.

The same frameworks used to expand the gas system — such as Niagara Mohawk's Neighborhood Expansion Program — could be deployed in assessing how best to target electrification opportunities. The Neighborhood Expansion Program uses a modeling methodology to review all end points on the Company's existing gas distribution system and analyze customer density in these areas to identify main extension opportunities. As states are trying to align the economics of climate policies and decarbonization of the gas system, elimination of these line extension subsidies are an important step to take. There is no longer a “network benefit” of having more customers connected to the system, and sufficient non-gas alternatives exist to provide basic heating and cooking needs such that a connection does not need to be subsidized.

As detailed further below, Commissions should explore opportunities to model electric heat pump pilot programs instead of traditional gas expansion efforts, such as through targeting specific locations and neighborhoods for fuel switching opportunities.<sup>87</sup> These fuel switching opportunities should leverage existing energy efficiency programs, when possible. States may want to provide incentives to make the switch and identify areas where opportunities for networked geothermal loops exist.<sup>88</sup> In particular, networked geothermal loops present an example of business model innovation potentially available to gas utilities.

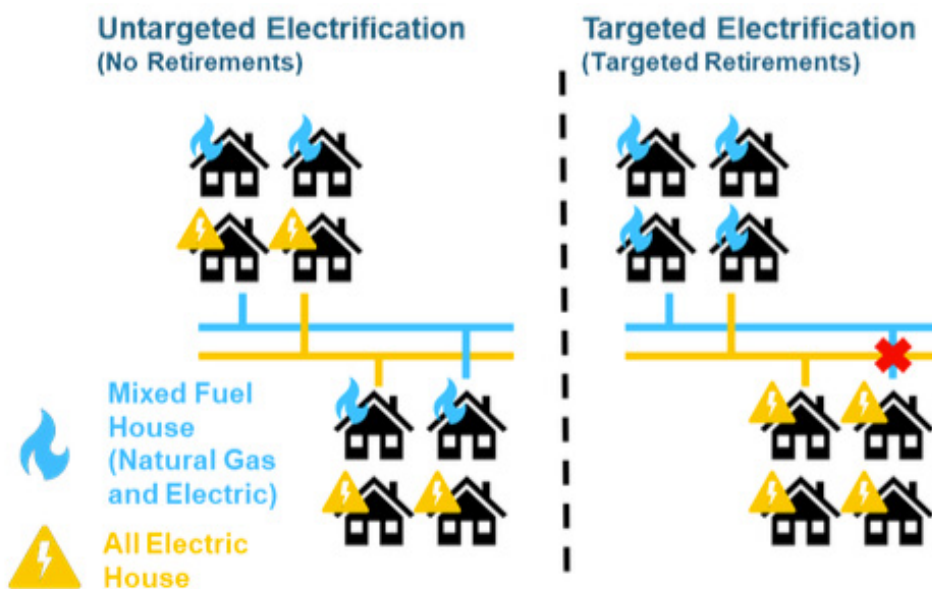


## Design Targeted Non-Pipeline Alternative Programs

As discussed above, non-pipeline alternatives can be a critical way to contain system costs. One of the largest customer segments are residential customers, and building electrification is already highly cost-effective and accessible in many parts of the country.<sup>89</sup> Electrifying a building means a reduction in gas throughput and also a reduction in the gas utility's customer base. Decision makers should coordinate this contraction in a managed way in order to ensure costs remain reasonable for the remaining gas customer base. In California, one estimate projects an approximate 5x cost difference between a managed and an unmanaged transition.<sup>90</sup> Electrification is expensive and requires site control, both of which may create an unlevel playing field. If a state's wealthier customers (who typically own their own home) can afford to electrify and have the ability to do it, they leave the costs of the legacy gas system to the low-income populations (who typically rent and do not have site control). Therefore, absent policy intervention, untargeted electrification could create an unintended cost shift to the most vulnerable populations.

At the same time, state regulators must consider the gas infrastructure and maintaining a reliable system, including the embedded costs of the system. As demonstrated in the figure below, assume you have two similarly situated neighborhoods supplied with gas service. In the left-hand side graphic below, electrification occurs in an untargeted way, where 50% of the homes electrified but the remaining infrastructure stays in place and costs increase for the remaining customers. In the right-hand side of the figure below, electrification is targeted: the same 50% of the homes electrified, but now a piece of the gas system can be taken out of service. Ratemaking techniques can be deployed to keep rates affordable for the remaining customers and keep shareholders whole for their existing investments.

**Figure 8:** Example of Targeted Electrification



Source: E3

Regulators should further consider the embedded value of the gas line in their targeting. Again, on the right-hand side of the figure, there are two lines that could have been targeted. Assume that the top blue line has recently been worked on and has a large remaining book value, and the lower neighborhood is about to be upgraded and has a relatively low embedded value. All else being equal, using electrification as a non-pipeline alternative to the upgrade saves all the customers more money since the residual value of taking that line out of service is less compared to the upper line. Regulators should require targeted electrification using specific gas metrics, such as remaining book value, depreciation rates and other financial considerations as ways to minimize any stranded value.

As Commissions explore strategies to manage the contraction of the natural gas system via non-pipeline alternatives (such as electrification of customer energy usage currently served by the gas system), there are four key considerations to ensure equity during the transition:

1. Target deployment of building electrification as non-pipeline alternative programs;
2. Ensure that the targeting considers the embedded cost of the gas system;
3. Make non-pipeline alternatives accessible to all building stocks and ownership profiles in that area; and
4. Craft an appropriate rate design for the remaining customer base to protect against unnecessary cost shifts.

## Link Shareholder and Societal Value

Against a backdrop of change spurred by new technologies, evolving customer expectations and state climate goals, regulators are forced to consider how regulated companies “make money in order to better manage this change, reward innovation, and provide more value for customers’ money.”<sup>91</sup> In order to link shareholder and societal value, regulatory policies should create incentives for companies to innovate. Instead of relying on rate of return as the sole value driver, regulators should allow companies to earn increased revenues when they provide value-based products and services.<sup>92</sup> There must also be a means to differentiate among company performance.<sup>93</sup>

This is particularly critical where system buildout and expansion is no longer a primary objective. Under the current regulatory framework, companies create investor value every time they make capital investments. While traditional cost-of-service regulation provides a return sufficient to finance and build essential infrastructure, it offers few incentives for higher levels of reliability and safety, and lower levels of cost and environmental impact demanded today. To achieve emissions reductions needed to safeguard climate, it is necessary for the market design to reward efficient and more capable use of regulatory assets rather than simply incentivizing more steel in the ground. Regulators should determine strategies to reward the prudent management of the contraction of the gas system so that there are parallel shareholder incentives to the continuous expansion model.

Different approaches will be needed for stand-alone gas utilities as compared to combined gas and electric utilities. Whereas the latter will face growth opportunities to pursue electric infrastructure options, stand-alone gas utilities will face diminished growth opportunities and thus will require new regulatory tools and approaches.

For stand-alone gas utilities, there are a number of methods for changing utility incentives, including increased use of revenue decoupling mechanisms for gas utilities, shareholder earnings/allowance of return for non-pipeline alternatives and other non-traditional assets, and performance-based ratemaking strategies. Shared savings strategies and revenue decoupling mechanisms break the link between the revenues a utility receives and the level of sales it makes, eliminating the incentive for a utility to expand its sales and the disincentive for energy efficiency programs.<sup>94</sup> However, as gas system usage decreases due to electrification, revenue decoupling mechanism targets will also decrease, resulting in a continued misalignment between needed electrification and utility incentives; similarly, increased gas infrastructure will continue to result in greater shareholder profits. Performance-based ratemaking strategies have the potential to address this, by offering direct incentives to gas utilities for engaging in activities that result in decreased usage and infrastructure buildout; however, these strategies must be carefully designed to ensure that shareholder and societal value are aligned. Regulators can also consider allowing gas utilities to earn a return on non-traditional assets, including non-pipeline alternative projects and alternative technologies like networked geothermal loops.

In several of the ratemaking techniques outlined throughout this paper, the risk to shareholders is explicitly considered. The strategies are designed to minimize investment risk; implicit is that regulators should “honor the promises of the past” to have future clean energy investments be as affordable as possible. When implementing policies to align with climate goals, regulators should continue to find ways to minimize investment risk for both existing and new investments. This lowering of risk profile should be further integrated and reflected in the gas utility’s authorized return on equity.

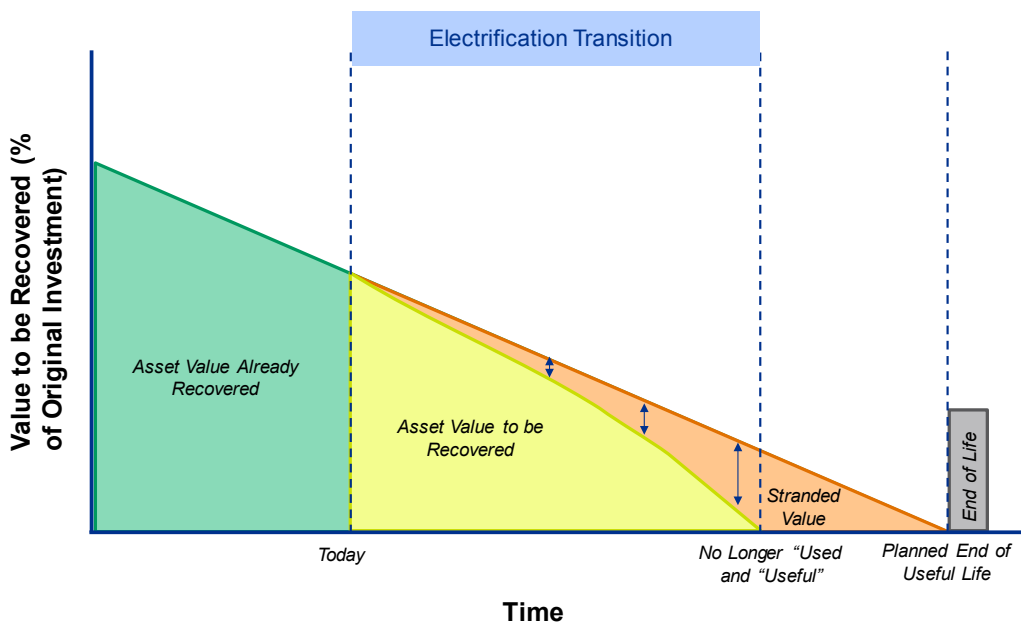
Depending on the actions taken by the regulatory body, the utility’s return on equity can reflect a more securitized investment climate. For combination gas and electric utilities, regulators should also ensure that the return on equity and other ratemaking treatment of gas assets as compared to electric assets is properly aligned with the actual characteristics of those assets and achievement of state policy goals. Many of the actions proposed in this toolkit come with the aim of minimizing investment risk for gas infrastructure and operations, and that reduction in risk should be reflected in the calculation of the authorized rate of return for gas versus electric. This includes an acknowledgement that there will be increased growth opportunities for electric infrastructure as gas infrastructure undergoes its managed contraction.

## **Align Depreciation Schedules with Climate Targets**

When a new gas asset is put into service today with a depreciation rate based on ratemaking practices developed based on historic policies, that creates an implicit assumption that the long-term usage of that asset will not be impacted by climate goals. It also creates an accompanying risk of the asset becoming stranded if those policies do result in changes. In essence, regulators are determining that the asset will be “used and useful” for the entire life of the asset, even if that date extends beyond its climate goals. While gas utilities depreciate all kinds of assets, their largest asset is their pipes. The depreciation rate for pipes is typically around 2.5%, given the assumption that the economic life will be long-lived and it will be considered “used and useful” over that long life.<sup>95</sup> For example, an asset put into rate base in 2020 with a 2.5% depreciation rate will be in rate base until at least 2060, far beyond the target dates of the state climate laws. As described above, continued usage of natural gas at current

levels is not consistent with achievement of state climate goals. Therefore, as electrification increases, and particularly where a path to full electrification is pursued, some assets will reach the end of their used and useful status before the end of their expected useful life, and therefore before they are fully depreciated. This means that certain investment could become stranded.<sup>96</sup> An illustrative example of this shortfall is demonstrated in the figure below.

**Figure 9:** Example of Changes to a “Used and Useful” Asset as Electrification Occurs



As an initial matter, gas utilities must assess how the imperative to decarbonize energy end use by midcentury will impact the economic useful lives of their infrastructure, both through evaluation of existing infrastructure and as part of any proposal for new infrastructure. Some gas utilities have started down this path. Consolidated Edison Company of New York Inc.’s Joint Proposal, approved by the New York Public Service Commission, obligates the Company to file a study on “the potential depreciation impacts of climate change policies and laws on its gas, electric, steam, and common assets.”<sup>97</sup> Corning Natural Gas Corporation in New York states that, as a consequence of New York’s climate law, Corning’s assets (and improvements that reduce GHG emissions) should be permitted to have “depreciable lives [that] match the expected economic lives of utility assets.”<sup>98</sup>

Shortening depreciation schedules could, by definition, shorten the cost recovery timeline and raise gas rates. Regulators will then need to allocate those new costs in the most equitable way possible, including to customers who will remain on the system long term. Increasing gas system costs may also further motivate a transition away from the gas system to electrification, and regulators must consider the right balance and timing of these changes.<sup>99</sup> Changes to accelerate the depreciation schedule to make existing infrastructure in line with climate goals is only one method; additional options are detailed in an earlier EDF report “Managing the Transition: Proactive Solutions for Stranded Gas Assets in California.”<sup>100</sup>

## Evaluate Cost Allocation

Reduction in demand for gas spurred by climate laws could also mean a significant reduction in the need for, and utilization of, extensive gas infrastructure. If utilities face a declining customer base, the already committed investments and the ongoing costs of operation and maintenance of the gas system will be spread over a smaller number of customers. This could lead to an increase in gas rates for remaining customers. Left unaddressed, this could result in a “death spiral,” where low to moderate income ratepayers, who are most sensitive to rate increases and least able to electrify without focused support, become increasingly burdened with higher rates.<sup>101</sup>

As part of a managed contraction of the gas system, regulators will need to determine who will be using the system long term. One customer category may be gas-fired electric generators. A second may be industrial consumers, where substitutes for natural gas as a feedstock or fuel for process heat are not currently readily apparent. Commissions will be required to resolve these tensions through changes to rate design and cost allocation. California has been forced to address this issue today, as it reevaluates costs associated with gas-fired electric generation use of the gas utility system.<sup>102</sup> The equity concerns here are critical, since low-income populations will not be first actors and could bear a large cost increase without policy intervention.

As discussed above, Commissions may want to implement a gas investment priority order. As part of the guidance contained in that document, Commissions may want to change how they charge for the infrastructure, including fixed charges to access the pipeline. In some states, customers who leave when the utility has previously made a large fixed cost investment on their behalf are issued a departing load charge or an exit fee. This fee makes it so that the customer pays for their “fair share” of the investment made on their behalf and that the remaining customers and the utility shareholders are left indifferent; regulators may want to examine if an exit fee would be appropriate for the gas context, with the recognition that such a fee could act as a disincentive against decarbonization, so the exit fee may need to be paid through other sources of funds, as opposed to customer monies. Legislative authority may be required to issue a securitized bond or tax funds or other non-ratepayer funds.

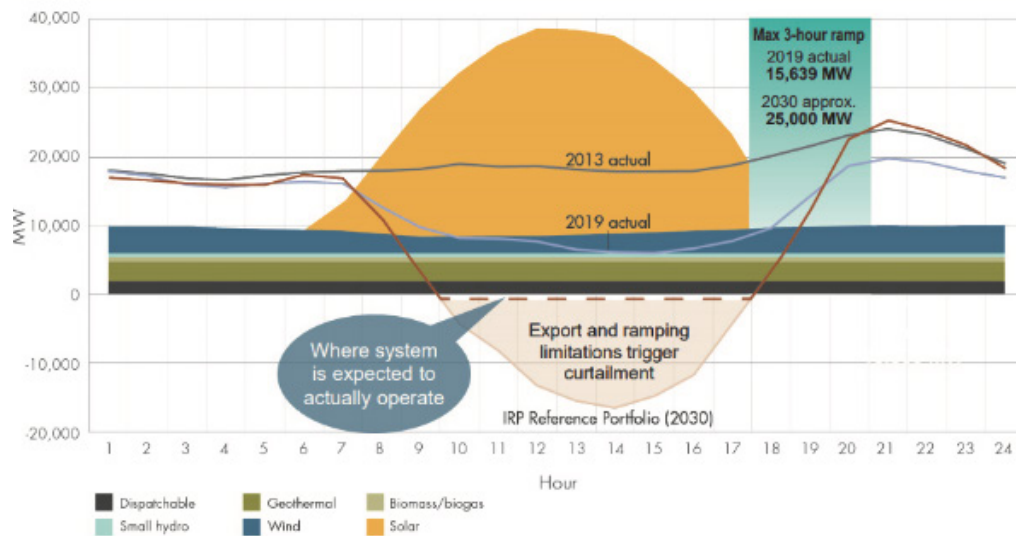
Regulators may also want to consider how to more clearly delineate the value between firm and interruptible gas services and allocate costs accordingly. Firm gas service in a decarbonized economy may have different system costs, and under the principle of cost causation pays, re-assignment of cost allocation to those who will remain on the system may be a viable option. Regulators should prioritize the equity considerations of this cost allocation transition.

## Explore New Tariff Services

The changing needs and dynamics of the electric system should also inform regulators’ actions, given the interplay between the gas and electric systems. Against the backdrop of laws and policies driving decarbonization, Commissions must consider what market design constructs will most effectively support a future electricity system with high penetrations of renewables and other zero/low carbon resources. The role of gas generators in this future system will evolve and the services supporting these generators will need to reflect this new reality. Commissions should follow first actor states like California and New York and reevaluate generator pricing policies in light of these contemporaneous and evolving market conditions.<sup>103</sup>

Gas-fired generation use of the system will become increasingly variable as more renewable resources penetrate the grid. As projected by CAISO, gas-fired electric generation will increasingly provide ramping and flexibility to accommodate renewable integration. While the need for afternoon ramping barely existed in 2013, it becomes quite pronounced by 2030 as shown in the figure below.

**Figure 10:** California’s “Duck Curve” Demonstrating the Need for Additional Gas-fired Electric Generator Ramping, which May Require a New Gas Tariff for System Cost Implications

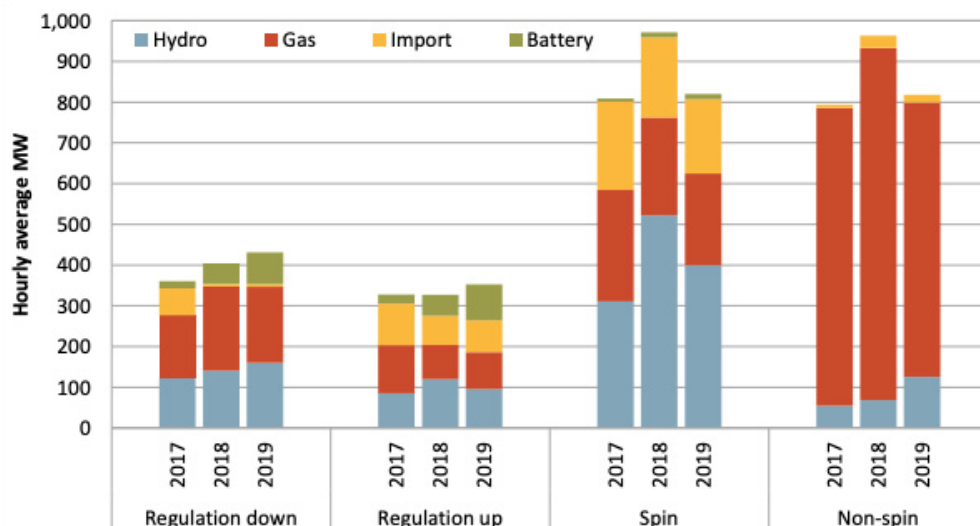


Source: California Independent System Operator Corporation

In order for gas generation units to provide the required ramping capability to the electric grid, they need to be able to access gas supplies and capacity services that correspond to their daily variations in load.<sup>104</sup> The suite of transportation and balancing services should complement and facilitate the variable needs of generators. New tariff services — such as a Renewable Balancing Tariff proposed by Southern California Gas Company for consideration by CPUC staff — will need to be offered in order to send correct operational and price signals for the cost and relative value of the flexible services provided by gas utilities to these gas-fired electric generators.<sup>105</sup>

Bringing transparency and price discovery to gas transportation service for generators has implications for the competitiveness of the electric grid and those resources which can compete with natural gas to provide flexibility services. Today in CAISO, for example, costs associated with the balancing service provided by the gas system are not reflected in electric generator bids.<sup>106</sup> Thus, one of the most essential attributes to our future grid — flexibility — is not specifically delineated but rather embedded within the cost of transportation capacity. This muddles the market for participation by more dynamic, data-driven resources like batteries and demand response. Although various types of resources can provide flexibility services, the market for these services is currently dominated by gas-fired units.<sup>107</sup>

**Figure 11: CAISO Ancillary Service Procurement by Internal Resources and Imports**



Source: California Independent System Operator Corporation

Without delineating and pricing the flexibility that gas provides (i.e., sub-day non-ratable flows), electric markets will not effectively spur competition, innovation or investment in the provision of these services. As more fossil fuel units are eliminated from the system, a portfolio of zero-emitting resources will necessarily be required to match, either individually or collectively, the balancing capabilities of these units.<sup>108</sup> Commissions should consider the types of gas market changes that will be needed in order to facilitate this more dynamic electric grid.

## Scrutinize Affiliate Transactions

Numerous utility holding companies are transacting on both sides of pipeline expansion projects, as both pipeline developer and long-term gas shipper.<sup>109</sup> Although the risks associated with self-dealing affiliate transactions have been widely detailed at both the state and federal level, these transactions are not subject to a sufficient level of review at the federal level and likely are also under-reviewed in many states.<sup>110,111</sup> At the federal level, the Federal Energy Regulatory Commission (FERC) has historically declined to review the terms of precedent agreements between affiliates unless there is evidence of self-dealing, finding that “any attempt by [FERC] to look behind the precedent agreements [in a certificate] proceeding might infringe upon the role of state regulators in determining the prudence of expenditures by the utilities that they regulate.”<sup>112,113</sup>

At the state level, depending on state law, review of affiliate precedent agreements may not occur until after the pipeline is placed into service and the utility seeks to recover its pipeline transportation costs. Once FERC grants a certificate application, state Commissions are limited to reviewing whether the contracting utility was prudent in contracting with its affiliate pipeline developer, as compared to other alternatives.<sup>114</sup> The cure for this gap in oversight is to ensure sufficient regulatory safeguards are in place at both the federal and state levels prior to construction of a pipeline capacity expansion. State Commissions should consider standards of conduct that specifically protect against affiliate contracts for transportation service.<sup>115</sup> Additional reviews of state level affiliate transition rules may be necessary to ensure that the affiliates are acting in alignment with the new climate objectives.

## Consider Pilots to Test Innovation

There are opportunities for gas utilities to participate in the energy system transition offering new options to their ratepayers, including alternative heating and cooling options and alternative, lower carbon fuels. Certain utilities have started exploring these options through pilots, including those related to geothermal heating and cooling and distribution of biomethane.

Distribution of biomethane, as well as other lower carbon fuels like hydrogen produced with no or low GHG emissions, has the potential to allow continued use of gas utility infrastructure to serve customers for whom electrification is likely to be particularly expensive and difficult. However, any proposed usage of these fuels must recognize the potential impacts of continued gas usage, including emissions, as well as the limited overall availability of these fuels.

Gas utilities could also support achievement of state climate goals in coordination with electric utilities by participating in the expansion of geothermal heating and cooling where feasible, including through developing and owning networked geothermal loops serving multiple residential and non-residential customers, as proposed by the Home Energy Efficiency Team.<sup>116</sup> These networked geothermal loops could be developed and billed for under a relatively traditional utility ratemaking paradigm, with the gas utilities transitioning to a business model where they act as “thermal utilities.” In Massachusetts, Eversource Energy recently received approval to develop a networked geothermal loop as a demonstration project as part of its gas rate proceeding.<sup>117</sup> Similar thermal services have been offered by utilities in Europe, with Engie operating 320 district heating and cooling systems worldwide, some employing geothermal and others using a variety of different heat and cooling sources, including biomethane, river water and waste heat from factories, as well as more traditional fossil-fueled generators.<sup>118</sup>

In approving new pilot programs, regulators should ensure that such exploration adheres to the following principles:

- Accountability
- Scalability
- Equity
- Reducing GHG emissions

*Accountability.* Pilot projects and other new initiatives should require regular and detailed reporting during the project and at its conclusion, ensuring that regulators and the public can track the pilot and understand its progression. Reporting requirements and time intervals should be clearly specified as part of the project approval process, and the utility should disclose detailed data collected during the pilot so that it can be effectively analyzed by others.<sup>119</sup>

*Scalability.* A pilot project is by nature a small-scale application of a technology or program, with the idea that a successful pilot could lead to broader implementation and broader benefits. Thus, prior to approval, regulators should require a utility to articulate its vision for the future of the project if the pilot were to succeed, including a demonstration that the pilot could in fact be scaled up and that the scope of the pilot is adequate to generate useful information and results.<sup>120</sup> For example, gas utilities are articulating plans to incorporate the use of biomethane into their systems and proposing biomethane pilot projects, but many experts have raised concerns about levels of availability and overall environmental integrity of



the gas.<sup>121,122,123</sup> It is reasonable and responsible for a utility to demonstrate anticipated supply and scalability of biomethane as part of a justification for such a pilot project.

*Equity.* The clean energy transition should not only treat disproportionately impacted communities fairly, it should remedy past harms and ensure expanded access to clean energy opportunities for overburdened neighborhoods and homes. Gas utilities now have a universal duty or obligation to serve all customers who request service; the obligation to serve was created, in part, to promote equity to customer groups who were initially denied gas service because of a form of “redlining” where utilities refused to serve lower-income neighborhoods for fear of not being able to recover costs. Gas service was fought for on equity grounds, and universal service through an obligation to serve was a large win.<sup>124</sup> Now in an era of decarbonization, equity must be reconsidered. These same communities who fought for gas service when it was seen as a luxury should not be left “holding the bag” on a polluting system. Specific pilots should be done to uplift disproportionately impacted communities.

To ensure that such access is part of projects from Day 1, regulators should require pilot projects and new initiatives to specifically provide outreach to, and inclusion of, disproportionately impacted communities.<sup>125</sup> Academic research indicates that it is not enough for a utility to make a program available to any interested customer: “Incentive programs, even those that offer more generous payments to applicants that meet low-income requirements, are consistently under-utilized by lower-income and minority cohorts due to financial barriers, limited awareness of such programs, and lower rates of property ownership.”<sup>126</sup>

*Reducing GHG Emissions.* If the central purpose or benefit of a proposed pilot project is to reduce a utility’s GHG emissions, then the utility should be required to demonstrate that benefit. The utility should be required to: estimate the GHG emission reductions to be achieved by the project as a condition of regulator approval; report on the emissions impact throughout the project; and quantify the achieved GHG emission reductions at the conclusion of the pilot. Verifying progress is essential to achieving climate progress. As New York’s climate law states, GHG emission reductions must be “real, permanent, quantifiable, verifiable, and enforceable.”<sup>127</sup>

## Review Pipeline Replacement Programs and Surcharge Mechanisms

Utilities around the country have thousands of miles of aging gas lines made from cast iron, unprotected steel and other leak-prone materials. While gas utilities continually invest in modernization programs to replace aging natural gas infrastructure, several programs have been subject to increased scrutiny and challenges.<sup>128,129,130</sup> Addressing leak-prone pipe is critical to ensuring safety and also creates near-term climate benefits. However, like the development of new gas infrastructure, it is often predicated on an assumption that the replaced pipe will continue to be useful and necessary well into the future. Leak-prone pipe replacement is also expensive — Central Hudson Gas & Electric estimates an average cost of \$1.9 million per mile.<sup>131</sup> Thus, as continued investments are made, Commissions should require gas utilities to demonstrate how pipeline replacement programs will evolve to support and serve state climate goals. This assessment should be done with stakeholder input and should precede the utility’s next request for cost recovery.<sup>132</sup>

Rather than simply replacing all leak-prone pipe with new pipe, deliberate planning to retire gas infrastructure will be necessary, including through demand reduction strategies such as fuel substitution including electrification. As discussed above, regulators should explicitly consider the service of this leak-prone pipe — if the pipe is primarily serving residential or other distribution level assets, it may be more cost-effective to deploy a NPA and take the asset out of service. If the leak-prone pipe services backbone or transmission level uses, then prioritizing its replacement to eliminate these leaks should be a top priority.

## Deploy Advanced Leak Detection and Data Analytics

Gas utilities can, and should, incorporate advanced leak detection technology and data analytics (ALD+) into their leak management practices to more cost-effectively and rapidly reduce methane emissions while improving safety and reliability. In most utility service territories in the U.S., gas utilities historically repair and replace distribution infrastructure based primarily on safety and cost considerations, without considering environmental impacts — but that is changing. ALD+ uses highly sensitive sensors that can detect methane emissions on the level of parts per billion, and the emissions data are then analyzed using algorithms to draw out key information, identifying leaks and assessing leak size with much greater accuracy and precision than traditional leak survey methods.<sup>133</sup> EDF has contributed to scientific research to demonstrate the efficacy of ALD+ technology and advocates before Commissions across the country for the expanded use of ALD+.<sup>134</sup>

Peer-reviewed research has demonstrated that utility crews using traditional technologies locate only 35% of leaks on the gas distribution system compared to the leaks identified using ALD+.<sup>135</sup> Research has demonstrated that observed methane emissions from cities are about twice that reported in the U.S. EPA GHG inventory.<sup>136</sup> And more recently, researchers using data collected with ALD+ estimated that nationwide methane emissions from gas distribution pipes are about five times greater than projected by the U.S. EPA GHG inventory.<sup>137</sup>

Importantly, a few “super-emitter” leaks are responsible for a significant proportion of the leakage from gas distribution systems, making it essential for utilities to identify and address these leaks to reduce methane emissions.<sup>138</sup> ALD+ is an available technology that utilities should be using across the U.S. for exactly this purpose, and Commissions should require utilities to incorporate ALD+ into their operations. For example, California utility PG&E worked with ALD+ provider Picarro to identify and prioritize for repair the highest-emitting leaks in its system, as well as to collect methane emissions data that it reports to the CPUC. In 2018, PG&E used ALD+ to survey its entire service territory for high-emitting leaks larger than 10 standard cubic feet per hour (scfh).<sup>139</sup> Within that, PG&E surveyed 1/3 of its territory to identify leaks for compliance, while the remaining 2/3 of the territory was surveyed for emissions data without triggering sub-10 scfh leak indications that require follow-up.<sup>140</sup>

ALD+ has numerous useful applications. Utilities can use ALD+ to improve leak management practices, to prioritize leak-prone pipeline replacement as well as retirements, and to track their system-wide methane emissions.<sup>141</sup> These applications benefit public safety, ratepayers and the environment. Utilities should incorporate ALD+ into their operations, and regulators should require the use of ALD+ as a standard practice. Additionally, regulators should update leak incentive programs that disincentivize utilities from identifying additional leaks on their system.

## Review Lost and Unaccounted for Gas Mechanisms

Every gas utility suffers some amount of shrinkage or loss associated with leakage of natural gas, as well as other factors, from the distribution system they manage. Gas utilities account for the amount and value of this lost gas within a metric known as Lost and Unaccounted for Gas (LUAF or LAUF), which encompasses leaked gas as well as meter error, accounting and billing error, and imprecision associated with changes in system pressure. Utilities report on their lost and unaccounted for gas annually to the Pipeline and Hazardous Materials Safety Administration (PHMSA), and both PHMSA and the Energy Information Administration publish LUAF information.<sup>142</sup> Utilities are generally permitted to recover LUAF costs from ratepayers, though calculation and recovery methods vary.<sup>143</sup>

Quantifying the portion of LUAF attributable to distribution system leakage — aka, methane emissions — is possible based on system-wide leak surveys, recordings of discovered leaks and venting, and emissions factors.<sup>144</sup> Accordingly, gas utilities should be held accountable for these emissions under appropriate regulatory schemes, including restrictions on their ability to recover the cost of leaked gas and requirements to incorporate the societal cost of methane into long-term planning.

As mentioned above, actions by the CPUC provide a helpful model. The CPUC recently ordered that utilities must include in the cost-benefit analysis for their Leak Abatement Compliance Plans a quantification of the avoided social cost of methane.<sup>145</sup> This quantification should be provided for individual proposed methane reduction measures as well as for the plan as a whole, using the U.S. Government Interagency Working Group social cost of methane metric.<sup>146</sup> In the same order, the CPUC stated that major gas utilities will be limited in their rate recovery for LUAF attributable to methane emissions starting in 2025, to ensure the companies are achieving the intended methane reductions detailed in their leak abatement plans.<sup>147</sup> To avoid disallowed cost recovery for LUAF, each major gas utility must achieve a 20% reduction in methane emissions below 2015 levels. It is of note that in order to effectively track methane emissions reductions, a regulator must require annual, comparable reporting on leak reduction efforts by gas utilities. This can be achieved through use of advanced leak detection, as discussed above. Commissions should revisit their practices and standards for LUAF attributable to leaked gas and consider whether they are consistent with climate commitments.

# Conclusion

Climate science and ambitious climate goals create an imperative to immediately eliminate or reduce GHG emissions to a small fraction of what they are today. Meeting those goals requires concerted and focused action across all emitting sectors. Particularly in the many states targeting a reduction in emissions of more than 80% or net zero emissions by 2050, retail gas utilities must immediately begin planning for substantially declining natural gas usage to avoid excessive emissions and wasted investments.

Commissions can close the gap between state climate goals and gas utility actions and put their states on a path to meet their goals and avoid wasteful investments by taking the following three steps:

1. Establish inclusive and transparent decision making;
2. Require rigorous long-term planning; and
3. Coordinate near-term decisions and long-term goals.

Below is a synthesis of our recommended actions under each of these three categories to align gas regulatory policy and climate goals.

<b>Step 1: Establish Inclusive and Transparent Decision Making</b>	<b>Step 2: Require Rigorous Long-Term Planning</b>	<b>Step 3: Coordinate Near-Term Decisions and Long-Term Goals</b>
<ul style="list-style-type: none"> <li>• Review and Clarify Existing Processes</li> <li>• Ensure Utilities Provide Sufficient Information in Support of Requests</li> <li>• Encourage Broader Stakeholder Engagement</li> <li>• Consider Equity Input and Impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Require a Long-Term Vision Aligned with Climate Targets and Other State Policies</li> <li>• Define the True Needs of the System</li> <li>• Plan for Projected Utilization Changes</li> <li>• Conduct Robust, Transparent Gas Supply Planning</li> <li>• Evaluate Resources Using the All-in Cost Metric</li> <li>• Integrate Non-Pipeline Alternatives into Long-Term Planning</li> <li>• Establish a Gas Investment Priority Order</li> <li>• Conduct Thorough GHG Assessments</li> <li>• Ensure Gas and Electric Utility Coordination</li> </ul>	<ul style="list-style-type: none"> <li>• Connect Long-Term Planning to Cost Recovery</li> <li>• Identify Changes to Existing Programs that Incent Gas Use and Expansion</li> <li>• Design Targeted Non-Pipeline Alternative Programs</li> <li>• Link Shareholder and Societal Value</li> <li>• Align Depreciation Schedules with Climate Targets</li> <li>• Evaluate Cost Allocation</li> <li>• Explore New Tariff Services</li> <li>• Scrutinize Affiliate Transactions</li> <li>• Consider Pilots to Test Innovation</li> <li>• Review Pipeline Replacement Programs and Surcharge Mechanisms</li> <li>• Deploy Advanced Leak Detection and Data Analytics</li> <li>• Review Lost and Unaccounted for Gas Mechanisms</li> </ul>

# End Notes and References

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- <sup>1</sup> Center for Climate and Energy Solutions, U.S. State Greenhouse Gas Emissions Targets, [www.c2es.org/document/greenhouse-gas-emissions-targets/](http://www.c2es.org/document/greenhouse-gas-emissions-targets/).
- <sup>2</sup> Environmental Defense Fund, Managing the Transition, Proactive Solutions for Stranded Gas Asset Risk in California, [www.edf.org/sites/default/files/documents/Managing\\_the\\_Transition\\_new.pdf](http://www.edf.org/sites/default/files/documents/Managing_the_Transition_new.pdf).
- <sup>3</sup> The distribution of natural gas by state-regulated gas utilities to end-use customers results in greenhouse gas emissions at a number of points along the supply chain. First, the production of natural gas results in venting, flaring, and leakage of methane. Second, methane leakage occurs during the transmission of natural gas from production fields to the distribution utility's system, generally through interstate transmission pipeline regulated by federal agencies. Third, methane leakage occurs from the distribution utility's pipelines, overseen by state commissions. Finally, the combustion of natural gas by end-use customers, for heating, cooking, and other uses, results in carbon dioxide emissions. In addition, the energy used in producing and transporting natural gas causes greenhouse emissions.
- <sup>4</sup> D.C. Department of Energy and Environment, Clean Energy DC: The District of Columbia Climate and Energy Action Plan at 24 (Aug. 2018), [https://doee.dc.gov/sites/default/files/dc/sites/ddoe/page\\_content/attachments/Clean%20Energy%20DC%20-%20Full%20Report\\_0.pdf](https://doee.dc.gov/sites/default/files/dc/sites/ddoe/page_content/attachments/Clean%20Energy%20DC%20-%20Full%20Report_0.pdf).
- <sup>5</sup> EDF calculation based on the Intergovernmental Panel on Climate Change's Fifth Assessment Report. IPCC, Climate Change 2014: Synthesis Report (2014).
- <sup>6</sup> Alvarez et al., Assessment of methane emissions from the U.S. oil and gas supply chain, *Science*, 13 Jul 2018: Vol. 361, Issue 6398, pp. 186-188, [science.sciencemag.org/content/361/6398/186](http://science.sciencemag.org/content/361/6398/186).
- <sup>7</sup> 2018 IPCC Special Report, Global Warming of 1.5 degrees, <http://www.ipcc.ch/report/sr15/>.
- <sup>8</sup> Id.
- <sup>9</sup> Climate Leadership and Community Protection Act ("CLCPA"), 2019 N.Y. Sess. Laws 106.
- <sup>10</sup> CLCPA § 1(4); id. § 2 (codified at N.Y. Envtl. Conservation Law ("ECL") § 75-0107(1)).
- <sup>11</sup> Biden Harris Campaign, The Biden Plan for a Clean Energy Revolution and Environmental Justice, [joebiden.com/climate-plan/](http://joebiden.com/climate-plan/).
- <sup>12</sup> Climate Mayors, a group committed to leading on climate action, represents over 71 million Americans in over 435 U.S. cities. Climate Mayors, Statement on the Trump Administration's Announcement of Formal Withdrawal from the Paris Agreement (Nov. 4, 2019), [climatemayors.org/actions/letters-and-statements/](http://climatemayors.org/actions/letters-and-statements/); see also Carly Wipf, San Jose bans natural gas in new commercial buildings, *San Jose Spotlight* (Dec. 1, 2020), <https://sanjosespotlight.com/san-jose-bans-natural-gas-in-new-commercial-buildings/>. As an example, the City of Orlando, Florida is committed to achieving 100% percent clean energy by 2050 and the local electric utility has adopted a strategic plan to achieve net-zero carbon emissions by 2050. Amy Greene, WMFE, Orlando aims high with emissions cuts, despite uncertain path (Jan. 24, 2020), [www.wmfe.org/climate-prone-orlando-florida-tackles-emissions/142909](http://www.wmfe.org/climate-prone-orlando-florida-tackles-emissions/142909).
- <sup>13</sup> The Brattle Group, Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050 (Apr. 2020), [www.energy.ri.gov/documents/HST/RI%20HST%20Final%20Pathways%20Report%204-22-20.pdf](http://www.energy.ri.gov/documents/HST/RI%20HST%20Final%20Pathways%20Report%204-22-20.pdf).
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- <sup>15</sup> Justin Gundlach and Elizabeth B Stein, Harmonizing States' Energy Utility Regulation Frameworks and Climate Laws: A Case Study of New York, *Energy Law Journal*, Volume 41:211 at 225 (2020).
- <sup>16</sup> Colorado PUC Proceeding No. 20-M-0439G, Clay Clarke and Keith Hay, Colorado's Statutory Greenhouse Gas Reductions and the Governor's Greenhouse Gas Pollution Reduction Roadmap (Nov. 5, 2020).
- <sup>17</sup> NYPSC Case No. 12-G-0297, Proceeding on Motion of the Commission to Examine Policies Regarding the Expansion of Natural Gas Service, Order Instituting Proceeding and Establishing Further Procedures (Nov. 30, 2012), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=83153&MatterSeq=40220>.
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- <sup>20</sup> California PUC, California Electric and Gas Utility Cost Report at 53-55 (Apr. 2020), [www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About\\_Us/Organization/Divisions/Office\\_of\\_Governmental\\_Affairs/Legislation/2020/2019%20AB%2067%20Report.pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/Office_of_Governmental_Affairs/Legislation/2020/2019%20AB%2067%20Report.pdf).

- <sup>21</sup> NYPSC Case No. 19-G-0066, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company for Gas Service, Con Edison Response to Motion to Strike at 3 (July 19, 2019).
- <sup>22</sup> See, e.g., Mass. DPU Case No. 18-148, Petition of Boston Gas Company and Colonial Gas Company, each d/b/a National Grid, for review and approval of their five-year Forecast and Supply Plan for the period November 1, 2018 through October 31, 2023, Petition at 5 (Nov. 1, 2018) (“National Grid projects incremental sendout to traditional markets of 8,527 BBtus over the forecast period or 2,132 BBtus per year [assuming normal weather] [see Chart III-A-1, Base Case]. Overall, this growth represents a 7.1 percent total increase in sendout requirements over the forecast period, or 1.7 percent per year on average.”).
- <sup>23</sup> See, e.g., NYPSC Case No. 19-G-0066, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Consolidated Edison Company for Gas Service, Con Edison Gas Depreciation Rate Panel Exhibit No. DP-2 at 3 (proposing to recover the costs of gas mains over 80 years and gas services over 60 years) (Jan. 31, 2019).
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- <sup>26</sup> D.C. Law 22-257, Section 103 (effective date Mar. 22, 2019) (amending D.C. Code § 34-808.02) (“In supervising and regulating utility or energy companies, the Commission shall consider the public safety, the economy of the District, the conservation of natural resources, and the preservation of environmental quality, including effects on global climate change and the District’s public climate commitments.” (emphasis added)); CLCPA, 2019 N.Y. Sess. Laws 106, § 7.
- <sup>27</sup> CPUC Rulemaking 20-01-007, Long-Term Gas Planning Rulemaking, Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning (Jan. 16, 2020); NYPSC Case 20-G-0131, Gas Planning Procedures, Order Instituting Proceeding (March 19, 2020); Mass. DPU Docket No. 20-80, Investigation by the Department of Public Utilities on its own Motion into the role of gas local distribution companies as the Commonwealth achieves its target 2050 climate goals, Order (Oct. 29, 2020).
- <sup>28</sup> RIPUC Docket No. 4816, Gas Long-Range Resource and Requirements Plan for the Forecast Period 2017/18 to 2026/27, Joint Memorandum at 6 (Feb. 20, 2019).
- <sup>29</sup> Mo. PUC Case No. GR-2021-0127, In the Matter of Spire Missouri, Inc. d/b/a Spire (East) Purchase Gas Adjustment Tariff Filing, Comments and Motion to Establish Procedural Schedule of the Environmental Defense Fund, Office of the Public Counsel, Midwest Energy Consumers Group, and Consumers Council of Missouri (Nov. 9, 2020) (detailing why a one-page tariff filing, which failed to disclose a \$600M affiliate pipeline transaction, prevents the Commission from fulfilling its duty to protect customers against unreasonable rates).
- <sup>30</sup> NYPSC Case No. 93-G-0923, Restructuring of the Emerging Competitive Natural Gas Markets, Letter from Environmental Defense Fund regarding Heightened Scrutiny of Precedent Agreements Supported by Affiliates (June 19, 2017).
- <sup>31</sup> NYPSC Case No. 17-G-0610, Petition of Environmental Defense Fund for a Declaratory Ruling that Natural Gas Precedent Agreements and Transportation Agreements are Subject to Review Under Public Service Law Section 110(4), EDF Letter Requesting Action on Declaratory Petition (June 10, 2020) (requesting action on a petition filed three years ago regarding review of Consolidated Edison’s Mountain Valley Pipeline affiliate contract).
- <sup>32</sup> Id.
- <sup>33</sup> See, e.g., Mass. DPU Docket No. 18-47, NSTAR Gas Company, Hearing Officer Ruling on Petitions to Intervene (July 17, 2018), Appeal to Commission (July 24, 2018); Mass. DPU Docket No. 17-166, Bay State Gas Company, Order at 10-14 (October 30, 2018) (affirming hearing officer’s ruling on CLF’s petition to intervene), appeal docketed No. SJ-2018-0556 (Mass. November 28, 2018); Mass. DPU Docket No. 16-181, Boston Gas Company and Colonial Gas Company, Order at 11-14 (2017) (affirming hearing officer’s ruling on CLF’s petition to intervene), appeal denied No. SJ-2017-0466 (Mass. January 8, 2019) (Single Justice).
- <sup>34</sup> For more information, see California Public Utilities Code 1801-1812 and [www.cpuc.ca.gov/icompl](http://www.cpuc.ca.gov/icompl) for additional program details.
- <sup>35</sup> The 100% Network, Comprehensive Building Blocks for a Regenerative & Just 100% Policy at 9 (January 2020) [www.100percentnetwork.org/uploads/cms/documents/100-network\\_comprehensive-building-blocks-for-a-just-regenerative-100-policy-2020.pdf](http://www.100percentnetwork.org/uploads/cms/documents/100-network_comprehensive-building-blocks-for-a-just-regenerative-100-policy-2020.pdf) (“[F]rontline communities

should be considered leaders, partners, co-sponsors, and co-collaborators. There should be processes for co-governance and collective accountability with frontline communities, as well as consultation with Tribal nations. There should be full accessibility to public hearings and policies should include public funds to cover the costs and fees to enable intervenors to participate in regulatory proceedings.”). Such participation can be facilitated through the intervenor compensation model. For example, in California, non-market participants, including environmental groups and equity groups are compensated where they meaningfully contribute to the record in Commission proceedings, including for the hiring of expert witnesses. This statutory program was enacted in 1985 and rewards diverse stakeholder’s substantial contribution to the record. California Public Utilities Code 1801-1812. Other states may want to explore similar ways to incorporate compensating non-market participation to ensure a just and equitable outcome.

<sup>36</sup> See, e.g., CLCPA § 8(1), 2019 N.Y. Laws 106, <https://legislation.nysenate.gov/pdf/bills/2019/S6599> (establishing that state agencies including the Public Service Commission “shall promulgate regulations to contribute to achieving” the statewide GHG limits, though such regulations “shall not limit” the Department of Environmental Conservation’s authority to regulate GHG emissions pursuant to article 75).

<sup>37</sup> Initiative for Energy Justice, Energy Justice Scorecard, [iejusa.org/wp-content/uploads/2019/12/Energy-Justice-Scorecard.pdf](http://iejusa.org/wp-content/uploads/2019/12/Energy-Justice-Scorecard.pdf).

<sup>38</sup> Intervenor compensation is one model. Another innovative model is represented in a Memorandum of Understanding between the New York Power Authority (NYPA) and a coalition of community organizations, wherein NYPA agreed to secure and fund a consultant to provide technical and analytical services to the coalition members to facilitate incorporation of their perspectives.

See [www.documentcloud.org/documents/7230919-NYPA-PEAK-MOU.html](http://www.documentcloud.org/documents/7230919-NYPA-PEAK-MOU.html).

<sup>39</sup> Greenlining, Equitable Building Electrification (2019),

[https://greenlining.org/wp-content/uploads/2019/10/Greenlining\\_EquitableElectrification\\_Report\\_2019\\_WEB.pdf](https://greenlining.org/wp-content/uploads/2019/10/Greenlining_EquitableElectrification_Report_2019_WEB.pdf).

<sup>40</sup> Approximately one in three U.S. households faces a challenge in paying their energy bills, according to the Energy Information Administration, and about one in five households report reducing or forgoing necessities such as food and medicine to pay an energy bill. U.S. Energy Information Administration, Today in Energy: One in three U.S. households faces a challenge in meeting energy needs (Sept. 19, 2018), [www.eia.gov/todayinenergy/detail.php?id=37072](http://www.eia.gov/todayinenergy/detail.php?id=37072). The COVID-19 pandemic is further exacerbating energy burdens for disadvantaged communities and is expected to result in increasing utility bill debt. Vote Solar, Report: COVID-19 and the Utility Bill Debt Crisis, [votesolar.org/policy/policy-guides/low-income-solar-access/covid-19-and-utility-debt-crisis/](http://votesolar.org/policy/policy-guides/low-income-solar-access/covid-19-and-utility-debt-crisis/). As low-income gas utility customers struggle to cover their basic needs, it is essential that utilities provide equitable access to programs that can help relieve energy burdens, and that can ensure all customers have access to clean energy options.

<sup>41</sup> The 100% Network, Comprehensive Building Blocks for a Regenerative and Just 100% Policy (Jan. 2020), [www.100percentnetwork.org](http://www.100percentnetwork.org). It is not enough for a utility to make a program available to any interested customer. “Incentive programs, even those that offer more generous payments to applicants that meet low-income requirements, are consistently under-utilized by lower-income and minority cohorts due to financial barriers, limited awareness of such programs, and lower rates of property ownership.” Fournier, ED, Cudd, R, Federico, F, & Pincett, S., On energy sufficiency and the need for new policies to combat growing inequities in the residential energy sector, *Elem. Sci. Anth.*, 8:24 (2020), [doi.org/10.1525/elementa.419](https://doi.org/10.1525/elementa.419) (citing Bird & Hernández, 2012; Scavo et al., 2016; Parsons et al., 2018).

<sup>42</sup> While no state has completed its review, several are in the midst of taking such action. In January 2020, California opened a new rulemaking focusing on long-term gas planning. The Order Instituting Rulemaking explicitly mentions the state’s adopted climate legislation and the need to decarbonize the system as a motivation for its need to create a long-term plan. CPUC Rulemaking 20-01-007, Long-Term Gas Planning Rulemaking, Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning (Jan. 16, 2020). In response to Executive Order 20-04, the Oregon Public Utility Commission has developed several workplans, one of which is to “identify, prioritize, and deploy strategies to enhance and refine our existing least-cost, least-risk framework to ensure energy utilities are focusing their system-wide resource strategies on making rapid, large scale, and sustained progress to meet GHG reduction goals.” Oregon PUC, Executive Order 20-04 Draft Work Plans, <https://www.oregon.gov/puc/utilities/Documents/EO20-04-PUC-WorkPlan.pdf>.

<sup>43</sup> DC PSC Case 1142, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc., Washington Gas & AltaGas, Natural Gas and its Contribution to a Low Carbon Future: Climate Business Plan for Washington, D.C. (“Climate Business Plan”), (Mar. 2020).

<sup>44</sup> DC PSC Case 1142, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc., Comments of Environmental Defense Fund (June 26, 2020); DC PSC Case 1142, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc., Comments and Request to Institute an Evidentiary Proceeding of Sierra Club (June 15, 2020).

<sup>45</sup> The Mass DPU assesses each LDC’s long-range planning standards, demand forecasting methods, and resultant design and normal sendout forecasts in order to determine if they are reviewable, appropriate, and reliable. A forecast method is reviewable, if it “contains enough information to allow a full understanding of the forecast methodology”; appropriate, if it is “technically suitable to the size and nature of the

particular gas company”; and reliable, if it “provides a measure of confidence that the gas company’s assumptions, judgments, and data will forecast what is most likely to occur.” Mass. DPU Docket No. 08-34, NSTAR Gas Company, Order at 2.

<sup>46</sup> Mass. DPU Docket No. 20-76, NSTAR Gas Company d/b/a Eversource Energy, 2019-20 to 2023/24 Forecast and Supply Plan (July 15, 2020).

<sup>47</sup> See, e.g., Mass. DPU Docket No. 18-148, Boston Gas Company/Colonial Gas Company d/b/a National Grid, November 1, 2018 through October 31, 2023 Long-Range Resource and Requirements Plan at 5 (Nov. 1, 2018) (“National Grid projects incremental sendout to traditional markets of 8,527 BBtus over the forecast period or 2,132 BBtus per year [assuming normal weather] [see Chart III-A-1, Base Case]. Overall, this growth represents a 7.1 percent total increase in sendout requirements over the forecast period, or 1.7 percent per year on average.”).

<sup>48</sup> NYPSC Case N. 17-G-0606, Petition of Consolidated Edison Company of New York, Inc. for Approval of the Smart Solutions for Natural Gas Customers Program, Petition at 30 (September 29, 2017).

<sup>49</sup> Utility Dive, Climate risks are accelerating. Here’s what Duke, PG&E and 16 other utilities expect to pay (Nov. 18, 2020), [www.utilitydive.com/news/climate-risks-accelerating-heres-what-costs-duke-pge-and-16-other-utilities-expect/588860/](http://www.utilitydive.com/news/climate-risks-accelerating-heres-what-costs-duke-pge-and-16-other-utilities-expect/588860/).

<sup>50</sup> CPUC Rulemaking 20-01-007, Long-Term Gas Planning Rulemaking, Opening Comments of Environmental Defense Fund on Workshop Report at 3-4 (Nov. 2, 2020).

<sup>51</sup> NCUC Docket No. G-9, Sub 727, Annual Review of Gas Costs Pursuant to G.S. 62-133.4(c) and Commission Rule R1-17(k)(6), Testimony and Exhibits of Gennifer Raney on behalf of Piedmont Natural Gas Company, Inc. (Aug. 1, 2018), [starw1.ncuc.net/NCUC/ViewFile.aspx?Id=feb95b8f-afe1-4fab-8040-edd252c431a3](http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=feb95b8f-afe1-4fab-8040-edd252c431a3).

<sup>52</sup> See, e.g., Boston Gas Company d/b/a National Grid Long-Range Resource and Requirements Plan (Nov. 1, 2018), <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/10008562>.

<sup>53</sup> NYPSC Case No. 19-G-0309, Rates, Charges, Rules, and Regulations of The Brooklyn Union Gas Company d/b/a National Grid NY for Gas Service, Direct Testimony of Gregory Lander on behalf of Environmental Defense Fund (Aug. 30, 2019), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=232130&MatterSeq=59676>.

<sup>54</sup> California Gas and Electric Utilities, 2020 California Gas Report (2020), [www.socalgas.com/sites/default/files/2020-10/2020\\_California\\_Gas\\_Report\\_Joint\\_Utility\\_Biennial\\_Comprehensive\\_Filing.pdf](http://www.socalgas.com/sites/default/files/2020-10/2020_California_Gas_Report_Joint_Utility_Biennial_Comprehensive_Filing.pdf).

<sup>55</sup> RIPUC Docket No. 4816, The Narragansett Electric Co. d/b/a National Grid, Gas Long-Range Resource and Requirements Plan for the Forecast Period 2017/18 to 2026/27 at 5 (Feb. 20, 2019) (“In the past, the [Long Range Plan] filings were not controversial and tended to raise few complicated issues. But now, the Company needs to plan in a way that assures adequate capacity and delivery security under supply contracts, the magnitude and implications of which have grown substantially. As a result, the current framework and template for the Company’s long-range planning is no longer sufficient for an appropriate regulatory review”).

<sup>56</sup> NYPSC Case 20-G-0131, Gas Planning Procedures, Order Instituting Proceeding (Mar. 19, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=242672&MatterSeq=62227> (finding that “conventional gas planning and operational practices ... have not kept pace with recent developments and demands on energy systems” and that planning must be conducted consistent with the objectives of the CLCPA).

<sup>57</sup> For a detailed summary of each of these changes see Direct Testimony of Gregory Lander, supra n.53, <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=232130&MatterSeq=59676>.

<sup>58</sup> Specifically, gas utilities should provide: (1) Historic daily winter period demand curves for the prior five years by class along with the prior demand forecasts for the same periods; (2) Historic daily non-winter period demand curves for the prior five years by class along with the prior demand forecasts for the same periods; (3) Historic system winter period demand curves, (hourly and daily) for each of the Company’s take stations for the prior five years along with the demand forecasts for the same periods; (4) Historic system non-winter period demand curves, (hourly and daily) for each of the Company’s take stations for the prior five years along with the demand forecasts for the same periods; (5) The historic resource stacks of the Company employed to meet those historic demand curves; (6) The Company’s forecasted winter period system demand duration curves for the next five years; (7) The Company’s forecasted non-winter period system demand duration curves for the next five years; (8) The Company’s forecasted winter period demand curves, (hourly and daily) for each of the Company’s take stations; (9) The Company’s forecasted non-winter period demand curves, (hourly and daily) for each of the Company’s take stations; (10) The resource stacks (including separate presentation of their respective fixed and projected variable costs and projected load factor utilization) the Company has under contract to meet the Company’s forecasted forward period demand curves; and (11) For those forecasted demands not met by existing contract rights plus Company operated facilities, the Company should identify all potential resources (including non-pipeline solutions) under consideration and each such resource’s forecasted all-in cost (as defined above) and provide the detailed analysis and assumptions used for the build-up of such resources’ all-in costs presented by the Company. In addition, the Company should identify potential non-pipeline solutions not under consideration for each forecasted period, and the detailed analysis performed as to why the particular potential non-pipeline solutions are not under consideration for the subject period(s). Direct Testimony of Gregory Lander, supra n.53.



- <sup>59</sup> The “all-in cost” is determined by taking the sum of the fixed cost per year of the project plus the variable O&M cost of the project (i.e., total annual non-gas cost) divided by the projected annual Dth of use of project to arrive at modeled per Dth of use non-gas cost plus the variable commodity cost per Dth of the project.
- <sup>60</sup> NYPSC Case No. 17-G-0460, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Central Hudson Gas & Electric Corporation for Gas Service, Order Adopting Terms of Joint Proposal and Establishing Electric and Gas Rate Plan at 75 (June 14, 2018) (finding that that non-pipeline alternatives should be “explored as a universal practice as an alternative to traditional investments.”), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=209297&MatterSeq=54153>; NJ BPU Docket No. GO19070846, In the Matter of the Exploration of Gas Capacity and Related Issues, Order Soliciting an Independent Consultant (May 20, 2020) (acknowledging the role of non-pipeline solutions can have in reducing stress on the gas system). Non-pipeline alternatives reduce the need to invest in new infrastructure to meet new capacity by eliminating that new capacity need through non-physical infrastructure means.
- <sup>61</sup> NYPSC Case No. 19-G-0066, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company for Gas Service, Direct Testimony of Davide Maioriello at 11-12 on behalf of DPS Staff (May 24, 2019) (recommending that “the Commission require the Company to implement a new process for evaluating capital project suitability criteria to develop NPAs as substitutions for traditional utility solutions”), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=227186&MatterSeq=58902>.
- <sup>62</sup> For example, building upon the efforts of its upstate utility, National Grid filed a Non-Pipeline Alternative Incentive Mechanism as part of its 2019 rate case, acknowledging the “societal benefits of adopting more modern, cost-effective alternatives to traditional gas supply and gas transmission/distribution system solutions.” NYPSC Case No. 19-G-0310, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of KeySpan Gas East Corp. d/b/a National Grid for Gas Service, Future of Heat Panel Direct Testimony on behalf of National Grid, Exhibit FOH-11 at 3 (Apr. 30, 2019), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=225838&MatterSeq=59676>.
- <sup>63</sup> In California, Pacific Gas and Electric (“PG&E”) has started to employ non-pipeline alternatives through targeted electrification deployments. These investments tend to be “at the end of the line” where new investments would be expensive and have minimal customer interaction. As a dual fuel utility, PG&E is able to incent end use customers to electrify and capture operational savings. However, the utility does not earn a rate of return on these non-pipeline alternatives. Similar to non-wires alternatives, regulators may want to consider deployment of shared savings mechanisms, performance-based ratemaking or other shareholder incentives to encourage prudent deployment of these non-pipeline alternatives in more central portions of the system.
- <sup>64</sup> Direct Testimony of Gregory Lander, supra n.53.
- <sup>65</sup> See CPUC Docket No. 07-12-021, Application of Pacific Gas and Electric Company for Authorization to Enter into Long-Term Natural Gas Transportation Arrangements with Ruby Pipeline, for Cost Recovery in PG&E’s Gas and Electric Rates and Nonbypassable Surcharges, and for Approval of Affiliate Transaction, Decision Approving Gas Transportation Agreements at 85-93, 118-122 (Nov. 6, 2008) (citing CPUC D.04-09-022; CPUC D.06-12-029, Appendix A-3, Rule III.B.1; CPUC D.04-12-048) (explaining that the CPUC’s rules require utilities to use an open and transparent solicitation process when involving affiliates and have a neutral independent evaluator review solicitations that involve affiliates); Mo. PUC Case Nos. GR-2017-0215 and GR-2017-0216, In the Matter of Spire Missouri Inc.’s Request to Increase Its Revenues for Gas Service, Direct Testimony of Greg Lander at Schedule EDF-06 (Sept. 8, 2017) (proposing modifications to the gas supply and transportation standards of conduct).
- <sup>66</sup> For instance, an interstate pipeline could distinguish its proposal by incorporating additional features that would provide environmental benefit such as methane reduction measures. See, e.g., Iroquois Spring 2020 Report, [www.iroquois.com/site/assets/files/1057/spring\\_2020\\_safety\\_issue\\_web.pdf](http://www.iroquois.com/site/assets/files/1057/spring_2020_safety_issue_web.pdf) (“As part of the ExC Project, Iroquois plans to reduce methane and overall emissions at project sites through the installation of low Nitrous Oxide (NOx) turbine units that will reduce NOx emissions by 40% over standard turbine units, as well as adding oxidation catalysts on the newly installed turbines, thereby reducing Carbon Monoxide (CO) emissions by approximately 90%. In addition, Iroquois is proposing to install methane recovery systems at each project site to capture released natural gas from station operations.”).
- <sup>67</sup> NYPSC Case 19-G-0678, Proceeding on Motion of the Commission to Investigate Denials of Service Requests by National Grid USA, The Brooklyn Union Gas Company d/b/a National Grid NY and KeySpan Gas East Corporation d/b/a National Grid, Comments of Environmental Defense Fund (May 1, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=245648&MatterSeq=60912>.
- <sup>68</sup> CPUC, Integrated Resource Plan and Long-Term Procurement Plan, [www.cpuc.ca.gov/irp/](http://www.cpuc.ca.gov/irp/).

<sup>69</sup> The Report describes its consideration of “Climate Impact” as encompassing “the GHG emissions resulting from the solution, air quality impacts (which often go hand in hand with GHG emissions), and the potential of the solution to support decarbonization of the entire energy system.” NYPSC Case No. 19-G-0678, Proceeding on Motion of the Commission to Investigate Denials of Service Requests by National Grid USA, The Brooklyn Union Gas Company d/b/a National Grid NY and KeySpan Gas East Corporation d/b/a National Grid, Natural Gas Long-Term Capacity Report at 50 (Feb. 24, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=241230&MatterSeq=60912>. But the descriptions of individual supply options do not describe the associated GHG emissions and do not quantify any contribution to the emissions reduction goals of the Companies, State, or City. See, e.g., id. at 64 (describing the “Climate Impact” of a Peak LNG Facility as “similar to the other LNG options and 10-15% higher than standard natural gas,” without providing more specific quantification).

<sup>70</sup> NYPSC Case No. 19-G-0309, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of The Brooklyn Union Gas Company d/b/a National Grid NY for Gas Service, Direct Testimony of James Fine on behalf of Environmental Defense Fund (Feb. 7, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=240233&MatterSeq=59676>.

<sup>71</sup> Id.

<sup>72</sup> Vermont Gas, VGS Partners with Energy Co-op of Vermont to Offer Customers Comprehensive Energy Solutions, [www.vermontgas.com/vgs-partners-with-energy-co-op-of-vermont-to-offer-customers-comprehensive-energy-solutions/](http://www.vermontgas.com/vgs-partners-with-energy-co-op-of-vermont-to-offer-customers-comprehensive-energy-solutions/).

<sup>73</sup> Rulemaking 20-01-007 has ordered the consideration of these Renewable Gas Balancing tariffs but they have not yet been adopted.

<sup>74</sup> CPUC Docket No. 19-01-011, Order Instituting Rulemaking Regarding Building Decarbonization, Decision Establishing Building Decarbonization Pilot Programs (Mar. 26, 2020) (explaining that building decarbonization pilot program funding is authorized and financed pursuant to SB 1477).

<sup>75</sup> Southeast Colorado Power Association, Rebates, [secpa.com/member-services/rebates](http://secpa.com/member-services/rebates).

<sup>76</sup> 2019 Colo. Sess. Law Ch. 359 at 3290.

<sup>77</sup> NYPSC Case No. 19-G-0066, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company for Gas Service, Con Edison Response to Motion to Strike at 3 (July 19, 2019), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=229961&MatterSeq=58902>.

<sup>78</sup> NYPSC Case No. 19-G-0066, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company for Gas Service, Consolidated Edison Company of New York, Inc. Gas Infrastructure, Operations and Supply Panel Update/ Rebuttal Testimony at 8 (June 14, 2019), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=228276&MatterSeq=58902>.

<sup>79</sup> See, e.g., Spire Missouri Inc., Schedule of Rates and Charges Applying to Spire Missouri East Service Areas at 11 (March 20, 2018) (Purchased Gas Cost Adjustment tariff), [www.spireenergy.com/sites/default/files/2020-07/MOEastTariffs.pdf](http://www.spireenergy.com/sites/default/files/2020-07/MOEastTariffs.pdf).

<sup>80</sup> Mo. PUC Case No. GR-2021-0127, In the Matter of Spire Missouri, Inc. d/b/a Spire (East) Purchase Gas Adjustment Tariff Filing, Comments and Motion to Establish Procedural Schedule of the Environmental Defense Fund, Office of the Public Counsel, Midwest Energy Consumers Group, and Consumers Council of Missouri (Nov. 9, 2020) (detailing why a one-page tariff filing, which failed to disclose a \$600M affiliate pipeline transaction, prevents the Commission from fulfilling its duty to protect customers against unreasonable rates).

<sup>81</sup> NJ BPU Docket No. GR19050676, In the Matter of the Petition of New Jersey Natural Gas Company for the Annual Review and Revision of its Basic Gas Supply Service and Conservation Incentive Program (CIP) Rates for F/Y 2020, Motion of the Environmental Defense Fund to Intervene at 2 (arguing that the Company’s gas purchasing strategies, including estimated supply and demand requirements, should be viewed in light of the Energy Master Plan’s objectives and goals).

<sup>82</sup> RIPUC Docket No. 4816, Gas Long-Range Resource and Requirements Plan for the Forecast Period 2017/18 to 2026/27, Joint Memorandum at 7-8 (Feb. 20, 2019).

<sup>83</sup> Some of these subsidies are enshrined into commission regulations. See 16 NYCRR § 230.2 (specifying requirements for prospective residential gas customers who apply for heating service).

<sup>84</sup> NARUC, Report of the NARUC Task Force on Natural Gas Access and Expansion (Nov. 2017), [www.naruc.org/committees/committee-resources/natural-gas-access-and-expansion-task-force-resources/](http://www.naruc.org/committees/committee-resources/natural-gas-access-and-expansion-task-force-resources/).

<sup>85</sup> Illinois Commerce Commission Case No. 15-0218, Northern Illinois Gas Company, Application for Approval of Rider 33, Designated Extension Service Area (Feb. 23, 2017).

<sup>86</sup> RIPUC Docket No. 4380, Narragansett Electric Company d/b/a National Grid, 2014 Gas Infrastructure, Safety and Reliability Plan, Report and Order (May 3, 2013); Mass. DPU Docket No. 16-79, Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of a Natural Gas Customer Expansion Pilot Program, Order at 17 (Feb. 10, 2017).

- <sup>87</sup> NYPSC Case No. 17-G-0239, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Gas Service, Gas Growth Program Semi-Annual Progress Report (Apr. 30, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=245615&MatterSeq=53410>.
- <sup>88</sup> NYPSC Case Nos. 17-E-0459 and 17-G-0460, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Central Hudson Gas & Electric Corporation for Electric and Gas Service, Central Hudson Gas & Electric Corporation's Non-Tariff Implementation Plan & Compliance Filing for Non-Pipe Alternatives: Three Transportation Mode Alternatives (June 21, 2019) ("The Company has identified three separate project locations throughout the service territory where it is likely feasible and cost-effective to permanently retire non-essential sections of [leak prone pipe] ... For this initiative to be successful, an alternate heating fuel would need to be utilized by all customers that are currently being served with natural gas within the identified sections of LPP (i.e., 100% participation)."), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=228704&MatterSeq=54152>.
- <sup>89</sup> California Energy Commission, The Challenge of Retail Gas in California's Low-Carbon Future at page 15 (Apr. 2020), <https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/CEC-500-2019-055-F.pdf> ("This study finds that electrification in buildings is likely to be the lowest-cost means of dramatically reducing GHG emissions from California's buildings.").
- <sup>90</sup> Gridworks, California's Gas System in Transition: Equitable, Affordable, Decarbonized and Smaller, <https://gridworks.org/initiatives/cagas-system-transition/>.
- <sup>91</sup> Steve Kihm et al., You Get What You Pay For: Moving Toward Value in Utility Compensation – Part 1 Revenue and Profit at 2 (June 2015), [americaspowerplan.com/wp-content/uploads/2016/07/CostValue-Part1-Revenue.pdf](http://americaspowerplan.com/wp-content/uploads/2016/07/CostValue-Part1-Revenue.pdf).
- <sup>92</sup> Id.
- <sup>93</sup> Alfred Kahn, The Economics of Regulation: Principles and Institutions, John Wiley & Sons (1970).
- <sup>94</sup> NH PUC Docket No. DG 10-017, EnergyNorth Natural Gas, Inc. d/b/a National Grid NH, Direct Testimony of Susan F. Tierney at 35 (February 26, 2010).
- <sup>95</sup> DC PSC Case No. 1162, In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges for Gas Service, Direct Testimony of Witness White on behalf of Washington Gas at 14, table 2 (Jan. 13, 2020) (showing a current composite rate of 2.45% and a proposed composite rate of 2.54%), <https://edocket.dcpdc.org/public/search/details/fc1162/1>.
- <sup>96</sup> Environmental Defense Fund, Managing the Transition, Proactive Solutions for Stranded Gas Asset Risk in California (2019), [www.edf.org/sites/default/files/documents/Managing\\_the\\_Transition\\_new.pdf](http://www.edf.org/sites/default/files/documents/Managing_the_Transition_new.pdf).
- <sup>97</sup> NYPSC Case No. 19-G-0066, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Gas Service, Joint Proposal at 113 (Oct. 18, 2019), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=234578&MatterSeq=58902>.
- <sup>98</sup> NYPSC Case No. 20-G-0101, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Corning Natural Gas Corporation for Gas Service, Direct Testimony of Firouzeh Sarhangi at FS-5 (Feb. 27, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=241529&MatterSeq=62108>.
- <sup>99</sup> Environmental Defense Fund, Managing the Transition, Proactive Solutions for Stranded Gas Asset Risk in California (2019), [www.edf.org/sites/default/files/documents/Managing\\_the\\_Transition\\_new.pdf](http://www.edf.org/sites/default/files/documents/Managing_the_Transition_new.pdf).
- <sup>100</sup> Id.
- <sup>101</sup> Id.
- <sup>102</sup> CPUC Rulemaking 20-01-007, Long-Term Gas Planning Rulemaking, Opening Comments of Environmental Defense Fund on Workshop Report at 4 (Nov. 2, 2020).
- <sup>103</sup> CPUC Rulemaking 20-01-007, Long-Term Gas Planning Rulemaking, Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning (January 16, 2020); NYPSC Case No. 17-G-0011, In the Matter of a Review of Tariff Provisions Regarding Natural Gas Service to Electric Generators, Staff Proposal on Electric Generator Rate Design (Mar. 30, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=243483&MatterSeq=52581>.
- <sup>104</sup> Quadrennial Energy Review Task Force, Transforming U.S. Energy Infrastructures in a Time of Rapid Change, Appendix B – Natural Gas Infrastructure at 10 (Apr. 21, 2015) ("Many gas-fired power plants use large amounts of natural gas over short periods of time throughout the day. These swings can be very large—at full output, one 700MW natural gas power plant consumes as much natural gas on an hourly basis as the entire heating demand of a small city"), [https://www.jcs.mil/Portals/36/Documents/Doctrine/Interorganizational\\_Documents/doe\\_energy2015.pdf](https://www.jcs.mil/Portals/36/Documents/Doctrine/Interorganizational_Documents/doe_energy2015.pdf).

- <sup>105</sup> CPUC Rulemaking 20-01-007, Long-Term Gas Planning Rulemaking, Assigned Administrative Law Judge’s Ruling Issuing Workshop Report and Staff Recommendations, Seeking Comments and Modifying Proceeding Schedule (October 2, 2020) (requiring SoCalGas and PG&E to submit formal analyses outlining a proposal for a Renewable Balancing Tariff in their respective regions).
- <sup>106</sup> CPUC Rulemaking 20-01-007, Long-Term Gas Planning Rulemaking, Comments of Southern California Gas Company 45 (August 14, 2020).
- <sup>107</sup> CAISO 2019 Annual Report on Market Issues & Performance at 168,  
[www.caiso.com/Documents/2019AnnualReportonMarketIssuesandPerformance.pdf](http://www.caiso.com/Documents/2019AnnualReportonMarketIssuesandPerformance.pdf).
- <sup>108</sup> NYISO Annual Grid and Markets Report at page 26,  
<https://www.nyiso.com/documents/20142/2223020/2020-Power-Trends-Report.pdf/dd91ce25-11fe-a14f-52c8-f1a9bd9085c2>.
- <sup>109</sup> Select examples of precedent agreements supported by affiliated captive customers include the agreements filed in FERC Docket Nos. CP15-558 (PennEast Pipeline), CP15-554 (Atlantic Coast Pipeline), CP16-22 (Nexus Gas Transmission), CP16-10 (Mountain Valley Pipeline), CP17-40 (Spire STL Pipeline).
- <sup>110</sup> See, e.g., *Office of the Pub. Counsel v. Missouri Pub. Serv. Comm’n*, 409 S.W.3d 371, 377 (Mo. 2013) (“[a]s long as a [utility] is engaged in both monopoly and competitive activities, it will have the incentive as well as the ability to ‘milk’ the rate-of-return regulated monopoly affiliate to subsidize its competitive ventures”).
- <sup>111</sup> See, e.g., *Brooklyn Union Gas Co. v. FERC*, 190 F.3d 369, 374 (5th Cir. 1999) (explaining that an affiliate relationship is “a circumstance that ought to trigger a hard look”); *Cross-Subsidization Restrictions on Affiliate Transactions*, Order No. 707, 122 FERC ¶ 61,155 at P 4 (2008) (explaining “that a franchised public utility and an affiliate may be able to transact in ways that transfer benefits from the captive customers of the franchised public utility to the affiliate and its shareholders.”).
- <sup>112</sup> *Florida Southeast Connection, LLC*, 154 FERC ¶ 61,080 at P 84 (2016).
- <sup>113</sup> *Mountain Valley Pipeline, LLC*, 161 FERC ¶ 61,043 at P 53 (2017).
- <sup>114</sup> *Pike County Light and Power Co. v. Penn. Pub. Util. Comm’n*, 77 Pa. Cmwlth. 268 (1983).
- <sup>115</sup> See CPUC Docket No. 07-12-021, Application of Pacific Gas and Electric Company for Authorization to Enter into Long-Term Natural Gas Transportation Arrangements with Ruby Pipeline, for Cost Recovery in PG&E’s Gas and Electric Rates and Nonbypassable Surcharges, and for Approval of Affiliate Transaction, Decision Approving Gas Transportation Agreements at 85-93, 118-122 (Nov. 6, 2008) (citing CPUC D.04-09-022; CPUC D.06-12-029, Appendix A-3, Rule III.B.1; CPUC D.04-12-048) (explaining that the CPUC’s rules require utilities to use an open and transparent solicitation process when involving affiliates and have a neutral independent evaluator review solicitations that involve affiliates); Mo. PUC Case Nos. GR-2017-0215 and GR-2017-0216, In the Matter of Spire Missouri Inc.’s Request to Increase Its Revenues for Gas Service, Direct Testimony of Greg Lander at Schedule EDF-06 (Sept. 8, 2017) (proposing modifications to the gas supply and transportation standards of conduct).
- <sup>116</sup> Home Energy Efficiency Team (HEET), GeoMicroDistrict Feasibility Study (Dec. 2019),  
[heetma.org/wp-content/uploads/2019/11/HEET-BH-GeoMicroDistrict-Final-Report-v2.pdf](http://heetma.org/wp-content/uploads/2019/11/HEET-BH-GeoMicroDistrict-Final-Report-v2.pdf).
- <sup>117</sup> Mass. DPU Docket No. 19-120, Petition of NSTAR Gas Company doing business as Eversource Energy, pursuant to G.L. c. 164, § 94 and 220 CMR 5.00, for Approval of a General Increase in Base Distribution Rates for Gas Service and a Performance Based Ratemaking Mechanism, Order at 128-156 (Oct. 30, 2020).
- <sup>118</sup> Engie, District heating and cooling systems, [www.engie.com/en/businesses/district-heating-cooling-systems](http://www.engie.com/en/businesses/district-heating-cooling-systems).
- <sup>119</sup> For example, EDF has advocated that utilities implementing advanced leak technology should provide annual reports detailing their progress implementing the technology and disclosing the leak and methane emissions data obtained. See Picarro Emissions Quantification Results Final Report in Support of the Methane Leak Surveying Report for the PSE&G GSMP II Program (Dec. 14, 2018). In another example, National Grid in Downstate New York conducted a geothermal pilot project and filed quarterly reports detailing its progress. NYPSC Case No. 16-G-0058, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of KeySpan Gas East Corporation d/b/a National Grid for Gas Service, Geothermal Gas REV Demonstration Projects – Q4 2017 Report (Jan. 31, 2018),  
<http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=200689&MatterSeq=50089>.
- <sup>120</sup> For example, the New York Geothermal Energy Organization recommends that geothermal pilot projects include both individual loop and shared loop systems in order to gather data and compare both options. NYPSC Case No. 20-G-0381, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a for Gas Service, NY PSC Case Nos. 20-E-0380 & 20-G-0381, Statement of NY-GEO (Nov. 24, 2020),  
<http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=256354&MatterSeq=63187>.
- <sup>121</sup> DC PSC Case 1142, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc., Climate Business Plan (Mar. 2020),  
<https://edocket.dcpsc.org/public/search/details/fc1142/597>; NYPSC Case No. 19-G-0678, Proceeding on Motion of the Commission to Investigate Denials of Service Requests by National Grid USA, The Brooklyn Union Gas Company d/b/a National Grid NY and KeySpan Gas

- East Corporation d/b/a National Grid, Natural Gas Long-Term Capacity Report at 50 (Feb. 24, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=241230&MatterSeq=60912>.
- <sup>122</sup> NYPSC Case No. 20-G-0381, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a for Gas Service, Direct Testimony of the Future of Heat Panel pages 41-49 (July 31, 2020) (describing Renewable Natural Gas Proposal), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=225838&MatterSeq=59676>.
- <sup>123</sup> See NRDC Issue Brief, A Pipe Dream or Climate Solution? The Opportunities and Limits of Biogas and Synthetic Gas to Replace Fossil Gas (June 2020), <https://www.nrdc.org/sites/default/files/pipe-dream-climate-solution-bio-synthetic-gas-ib.pdf>.
- <sup>124</sup> CPUC Rulemaking 15-03-010, Order Instituting Rulemaking to Identify Disadvantaged Communities in the San Joaquin Valley and Analyze Economically Feasible Options to Increase Access to Affordable Energy in those Disadvantaged Communities, Decision Approving San Joaquin Valley Disadvantaged Communities Pilot Projects (Dec. 13, 2018).
- <sup>125</sup> For example, the Massachusetts DPU encouraged Eversource to include a low-income, multi-family building and to specifically document efforts to include such a building in its cost-recovery filing. Mass. DPU Docket No. 19-120, Petition of NSTAR Gas Company doing business as Eversource Energy, pursuant to G.L. c. 164, § 94 and 220 CMR 5.00, for Approval of a General Increase in Base Distribution Rates for Gas Service and a Performance Based Ratemaking Mechanism, Order at 143 (Oct. 30, 2020).<sup>1</sup>
- <sup>126</sup> Fournier, ED, Cudd, R, Federico, F, & Pincetl, S., On energy sufficiency and the need for new policies to combat growing inequities in the residential energy sector, *Elem Sci Anth*, 8: 24 at 3 (2020), [doi.org/10.1525/elementa.419](https://doi.org/10.1525/elementa.419) (citing Bird & Hernández, 2012; Scavo et al., 2016; Parsons et al., 2018).
- <sup>127</sup> CLCPA, 2019 N.Y. Laws 106, § 2 (N.Y. ECL § 75-0109(3)(b)).
- <sup>128</sup> NARUC, Natural Gas Distribution Infrastructure Replacement and Modernization: A Review of State Programs (January 2020), [pubs.naruc.org/pub/45E90C1E-155D-0A36-31FE-A68E6BF430EE](https://pubs.naruc.org/pub/45E90C1E-155D-0A36-31FE-A68E6BF430EE) (describing 41 state infrastructure programs).
- <sup>129</sup> DC PSC Case No. 1154, WGL's Request for Approval of a Revised Accelerated Pipeline Replacement Plan, Brief of the Apartment and Office Building Association of Metropolitan Washington at 3 (Oct. 23, 2020) ("Where the Company's current total rate base for the District of Columbia is currently less than \$550 million, the Company's estimated costs per mile for Cast Iron main replacement suggest that the Company will need to expend an amount equivalent to more than six times its current total rate base just to replace the remaining 400 miles of Cast Iron mains on its DC distribution system."), <https://edocket.dcpsc.org/public/search/details/fc1115/399>.
- <sup>130</sup> Spire Inc., 2018 Form 10-K at 123, [www.spireenergy.com/spire-year-review/downloads/FY18-Form\\_10-K-FINAL.pdf](http://www.spireenergy.com/spire-year-review/downloads/FY18-Form_10-K-FINAL.pdf) (describing litigation brought by Office of Public Counsel).
- <sup>131</sup> NYPSC Case Nos. 17-E-0459 and 17-G-0460, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Central Hudson Gas & Electric Corporation for Electric and Gas Service, Central Hudson Gas & Electric Corporation's Non-Tariff Implementation Plan & Compliance Filing for Non-Pipe Alternatives: Three Transportation Mode Alternatives (June 21, 2019), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=228704&MatterSeq=54152>.
- <sup>132</sup> DC PSC Case No. 1154, In the Matter of Washington Gas Light Company's Application for Approval of PROJECTpipes 2 Plan, Brief of Environmental Defense Fund (Oct. 23, 2020), <https://edocket.dcpsc.org/public/search/details/fc1154/166>.
- <sup>133</sup> Weller, Z. D., Yang, D. K., & von Fischer, J. C. (2019), An open source algorithm to detect natural gas leaks from mobile methane survey data. *Plos One*, 14(2), e0212287, [doi.org/10.1371/journal.pone.0212287](https://doi.org/10.1371/journal.pone.0212287).
- <sup>134</sup> See, e.g., Weller, et al., A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems, *Environmental Science & Technology* (June 2020), <https://pubs.acs.org/doi/10.1021/acs.est.0c00437>; NYPSC Case Nos. 19-G-0309 & 19-G-0310, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of The Brooklyn Union Gas Company d/b/a National Grid NY for Gas Service, and of KeySpan Gas East Corp. d/b/a National Grid for Gas Service, Post-Hearing Brief of Environmental Defense Fund (Apr. 6, 2020), <http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=244048&MatterSeq=59676>.
- <sup>135</sup> Weller, Zachary et al., Vehicle Based Methane Surveys for Finding Natural Gas Leaks and Estimating their Size: Validation and Uncertainty, *Envtl. Sci. & Tech.*, 52, 11922-11930 (2018), <https://pubs.acs.org/doi/10.1021/acs.est.8b03135>.
- <sup>136</sup> G. Plant et al., Large Fugitive Methane Emissions from Urban Centers Along the U.S. East Coast, *Geophysical Research Letters* V. 46, I. 14 (July 2019), [agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019GL082635](https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019GL082635).
- <sup>137</sup> Weller et al., A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems, *Envtl. Sci. & Tech.*, 54, 8958-8967 (June 2020), [pubs.acs.org/doi/10.1021/acs.est.0c00437](https://pubs.acs.org/doi/10.1021/acs.est.0c00437).
- <sup>138</sup> A. R. Brandt et al., "Methane Leaks from North American Natural Gas Systems, *Science*, Vol. 343 (Feb. 14, 2011), [www.novim.org/images/pdf/ScienceMethane.02.14.14.pdf](http://www.novim.org/images/pdf/ScienceMethane.02.14.14.pdf); Weller, Z. D., Yang, D. K., & von Fischer, J. C., An open source algorithm to detect natural gas leaks from mobile methane survey data, *Plos One*, 14(2), e0212287 (2019) [doi.org/10.1371/journal.pone.0212287](https://doi.org/10.1371/journal.pone.0212287); see also Picarro

Emissions Quantification Results Final Report in Support of the Methane Leak Surveying Report for PSE&G's Gas System Modernization Program ("GSMP") II Program.

<sup>139</sup> Aaron Van Pelt, Picarro, Presentation: Picarro Natural Gas Network Management Solution at Slide 14 (Nov. 2019), <http://pstrust.org/wp-content/uploads/2019/11/Picarro-Pipeline-Safety-Trust-11-7-19-with-notes.pdf>;

see also PG&E, Natural Gas Leakage Abatement Report, Response to CPUC Data Request R.15-01-008, at p3, 9 (June 17, 2019).

<sup>140</sup> Id.

<sup>141</sup> See Palacios, Virginia et al. "Integrating Leak Quantification into Natural Gas Utility Operations," Public Utilities Fortnightly (May 2017), [www.fortnightly.com/sites/default/files/whitepapers/2017\\_Palacios%20et%20al\\_Integrating%20Leak%20Quantification%20into%20Natural%20Gas%20Utility%20Operations.pdf](http://www.fortnightly.com/sites/default/files/whitepapers/2017_Palacios%20et%20al_Integrating%20Leak%20Quantification%20into%20Natural%20Gas%20Utility%20Operations.pdf)

<sup>142</sup> 49 CFR § 191.11; see also, U.S. DOT, PHMSA, Report to Congress: Gas Distribution: Lost and Unaccounted for Natural Gas (May 16, 2017), [www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/news/17986/report-congress-lost-and-unaccounted-natural-gas-metrics-may-2017.pdf](http://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/news/17986/report-congress-lost-and-unaccounted-natural-gas-metrics-may-2017.pdf).

<sup>143</sup> See, e.g., CPUC, Rulemaking 15-01-008, Second Phase Decision Approving Natural Gas Leak Abatement Program Consistent with Senate Bills 1371 and 1383 at 41 (Aug. 21, 2019).

<sup>144</sup> Id.

<sup>145</sup> Id. at 36-38.

<sup>146</sup> Id. at 14, 36-38.

<sup>147</sup> Id. at 53-54.



March 22, 2021

Secretary Kathleen Theoharides  
Executive Office of Energy & Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Re: Draft Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides,

We appreciate the opportunity to comment on the draft Clean Energy and Climate Plan (CECP) for 2030 and are grateful to live in a state that is moving forward with such planning. We have participated in the drafting of several coalition statements and strongly support the Gas Leaks Allies Comments, the Joint Comments to ensure Inclusion of Climate Justice, and the Natural Gas Comments submitted for the Beyond Gas group by Acadia Center. We have only two additional brief comments to add.

Methane Emissions Accounting:

Regarding the data used for this plan, we very much wish to see methane emissions accounting be corrected at every level, as described in Recommendation 4 of the Beyond Gas comments. HEET has filed recommendations to improve LAUF (Lost and Unaccounted For Gas) accounting at the DPU and to improve gas distribution pipeline emissions accounting at DEP, however we believe this accuracy issue must necessarily be addressed agency-wide by EEA.

Our state should not be using outdated science, including outdated global warming potentials. Our accounting for methane impacts using a 100-year-time window is unfortunately a violation of physics - and physics does not negotiate! We also do not need to use emissions estimates when we have in our state a team of world-renowned scientists led by Prof. Wofsy at Harvard University and Prof. Hutyrá at Boston University who have been directly measuring our atmospheric methane emissions associated with natural gas since 2015. With better science, better data, we can better determine our path forward.

Inclusion of Gas Utilities & of Emerging Gas->Networked Geothermal Pathway:

Regarding the need for more detail on our gas system infrastructure, its safety, and our Gas System Enhancement Plan, the Gas Leaks Allies and Beyond Gas comments reflect HEET's concerns. We would like to add that just as Massachusetts is home to the atmospheric scientists mentioned above, we also are home to a remarkable effort by environmental organizations and gas utilities to seek solutions to these challenges together.

The first-in-the-nation approach that arose out of this unusual collaboration, incrementally networking geothermal or ground source heat pumps in the right-of-way to build a



thermal grid, is described briefly in the Gas Leaks Allies comments. Installed by gas utilities such infrastructure will greatly reduce the peak capacity needed from our electric grid, provide needed low-cost long-term energy storage, and shift a portion of building-electrification costs to utility financing, while providing equity of access to clean heating and cooling. Inclusion of this strategy will significantly improve the CECP.

Thank you for the opportunity to comment and we very much look forward to working together with you as we all forge the path forward together.

Sincerely,

A handwritten signature in black ink, appearing to read "Zeyneb Magavi".

Zeyneb Magavi

A handwritten signature in black ink, appearing to read "Audrey Schulman".

Audrey Schulman

Co-Executive Directors





**March 22, 2010**

## **Introduction**

The Coalition for Community Solar Access (CCSA) submits these comments for consideration in response to the draft Clean Energy and Climate Plan for 2030 (CECP). CCSA is a national coalition of businesses and non-profits working to expand customer choice and access to all American households and businesses through community solar. Our mission is to empower every American Energy Consumer with the option to choose local, clean and affordable community solar. CCSA thanks the Executive Office of Energy and Environmental Affairs (EEA) team for the hard work they have already put into the creation of the CECP and crafting the policy changes that will keep Massachusetts on track to meeting its climate and greenhouse gas reduction goals for 2030 and beyond.

CCSA offers these comments specifically on the plan for the development of renewable energy resources, particularly ground mounted solar photovoltaic (PV) resources. We understand that EEA must consider the impact a policy decision has on multiple objectives. The fact is, there are no easy paths forward for Massachusetts to achieve 45% emission reductions by 2030, and Net Zero by 2050. However, we are concerned that the CECP, as currently drafted, fails to appreciate the critical and strategic importance of supporting a robust solar market in Massachusetts in order to achieve both near-term goals for 2030, and long-term goals for 2040 and 2050. CCSA presents the following thoughts for consideration:

1. The solar goals in the 2030 CECP are insufficient to ensure that the solar market in Massachusetts remains robust through 2030 in order to achieve 2040 and 2050 goals
2. Solar is available, proven, and cost effective
3. Integrated distribution planning is critical to reaching Net Zero
4. Concerns about land use can require objective balance and can be addressed with thoughtful planning
5. Solar, and specifically community solar, can be utilized as an equitable resource to increase access to Environmental Justice communities

Massachusetts has long been a national leader on climate policy, and the EEA team has taken great strides to maintaining that course for the state's future with this proposal. With modest changes, the state will have an excellent roadmap to set up a path for success to achieving Net Zero by 2050.

## Massachusetts Must Ensure the Solar Market Remains Robust through 2030 to Achieve 2040 and 2050 Goals

The majority of the emissions reductions the state has accomplished since 1990 have been made in the electricity sector. Massachusetts reduced statewide emissions by 23% from 1990 to 2017, and most of the gains made statewide were due to reductions from the electricity sector. The electricity sector saw emissions reduced by 52% in that same timeframe, while the transportation sector saw no reductions, and the building sector saw a 17% reduction.<sup>1</sup> A number of intersectional policies helped support the impressive reductions in greenhouse gas emissions in the electricity sector, including expanded energy efficiency initiatives. But the role that growth of distributed solar in Massachusetts in the past ten years played in reducing sector-wide emissions cannot be underscored or emphasized enough.

### Widespread Electrification Will be Better Supported with Distributed Solar PV

The CECP and the 2050 Roadmap contain ambitious goals to electrify the building and transportation sectors; reaching the goal of net zero by 2050 will depend upon the widespread electrification of those two sectors, which together make up 69% of statewide GHG emissions. Aligning energy efficiency and grid modernization policies with widespread electrification is critical, but increased electric load across Massachusetts and the New England region in the coming decades cannot be avoided. The CECP projects that electricity demand will more than double by 2050 due to widespread electrification.<sup>2</sup> In order to maintain the gains already achieved in the electric sector, and to see actual improvements in the transportation and building sectors, we must ensure that the increased electricity supply will come from *clean, renewable resources*, and a significant portion of the portfolio of clean energy resources required to power this transition will need to be distributed PV.

The CECP 2030 does acknowledge the necessary role that ground mounted, distributed PV will play in this clean energy future. However, it falls perilously short in the near-term gains that must be made through 2030 to achieve those larger goals. In order to achieve the clean energy gains needed in the building and transportation sector, the report acknowledges a need for 40GW of solar to be deployed in New England.<sup>3</sup> Yet the CECP states that the existing policies to build solar through 2030, primarily the Solar Massachusetts Renewable Target (SMART) Program, plus an additional 2 GW of solar, are sufficient to meet the state's goals. That means that only a total 5.5 GW of solar would be installed through the rest of the decade, which would fall short of the ramp up of production needed through the coming decades.

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<sup>1</sup> *Interim Clean Energy and Climate Plan for 2030*, Issued December 30, 2020, p.13.

<sup>2</sup> *Ibid.*, p. 36

<sup>3</sup> *Ibid.*, p.41

## Suppressing the Solar Industry Now Will Have Lasting Effects

The CECP highlights the importance of the growth of the nascent offshore wind industry in the region. Offshore wind will be crucial to meeting our statewide and regional needs, but it remains subject to lengthy and complicated permitting and construction processes. Solar is readily deployable now, and serves as a complementary resource to offshore wind. But the *Energy Pathways to Deep Decarbonization Report* only assumes 7GW of solar in Massachusetts by 2050. This is in stark contrast to other statements being made in the report, primarily that Massachusetts and the New England region will need to build 1GW of offshore wind and solar per year between 2030-2050, reaching 40GW of ground mounted solar to support widespread electrification in the region by 2050.

The near-term goal in the CECP stands in contrast to other statements made throughout the *Energy Pathways to Deep Decarbonization* report. The report emphasizes the need for rapid buildout of ground mounted solar to achieve 2050 goals, but only after 2035. In fact, the “All options” pathway assumes no buildout of ground mounted solar from 2026-2036, and then an average annual capacity buildout of 0.6 GW from 2036-2040 and 1.3 GW from 2041-2050. Brattle noted in its September 2019 Report that a sustained and increasing solar industry will be necessary for the Commonwealth to reach its goals: “the ramp up does not have to happen on day one. Rather, the focus will need to be on mechanisms to keep the collective foot on the clean energy accelerator until annual installations approach a level that sustains an entirely new and significant industry based on renewable energy in the future.”<sup>4</sup> **Simply put, the Commonwealth cannot depend upon a substantial buildout of ground mounted solar to help provide the clean energy needed to reach our goals if the market is suppressed through 2030.**

This analysis puts in stark relief a central issue in the CECP. Primarily, we need to act assertively *now* in order to reach our broader goals. Climate change is impacting us now, and we cannot put off the challenging work of decisive action. The CECP and 2050 Roadmap both acknowledge how critical solar PV is and will continue to be in ensuring the electric sector lowers emissions. If there are issues with delivering clean energy through the expected transmission level projects from Hydro Quebec, or from the offshore wind procurements, Massachusetts will need to deploy that much more PV to stay on track. The CECP should increase the footprint of solar PV in the plan through 2030 to ensure the market is stable, secure, and ready to deploy at as high level of penetration as is needed in the decades from 2030-2050.

### **Solar is Available, Proven, and Cost Effective**

Solar provides the ideal vehicle for achieving the 2030 CECP’s stated goal of pursuing the lowest cost, lowest risk pathways to Net Zero. Solar is a proven, cost-effective technology that has been the backbone of the clean energy industry in the Commonwealth for over a decade.

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<sup>4</sup> Brattle – Achieving 80% GHG Reduction in New England by 2050: Why the region needs to keep its foot on the clean energy accelerator, 2019

While we support the diversification of resources, and the 2030 CECP's goal of 9.2 GW of offshore wind and 1 GW of hydropower by 2030, most of that power has yet to be delivered. According to US EIA, to date only 106 MW of utility-scale wind has been interconnected in Massachusetts<sup>5</sup>, though the state does anticipate an additional 800 MW of wind power to come online by the end of 2023. With regards to hydropower, only 420 MW has been deployed to date, 376 MW from Class II facilities, meaning they were in operation prior to 1998.<sup>6</sup> The deployment of 1 GW of hydropower from Quebec is reliant up on the successful completion of a highly controversial transmission line from Canada through Maine to the clean energy to Massachusetts. The delivery of these clean energy resources is not yet realized.

By contrast, according to the Solar Energy Industries Association (SEIA), about 3,047 MW of solar has been deployed in Massachusetts to date<sup>7</sup>, a number that represents real benefits for Massachusetts' residents, businesses and communities in the form of monthly electricity bill savings for on-site solar owners and community solar participants, tax revenue for local communities, jobs for Massachusetts workers, and investment made in towns and cities across the state. According to SEIA, there are 419 solar companies in the Commonwealth, including 71 manufacturers and 150 installers and developers. Total solar investment in the state to date has been approximately \$7,250.63 million<sup>8</sup>.

Not only has solar proven to be a scalable and cost-effective resource, it can continue to be the backbone of Massachusetts' clean energy economy through 2050 and beyond. A December 2020 report, "Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid,"<sup>9</sup> finds that "developing 247 GW of local rooftop and community solar would be the most cost-effective way for the United States to transition to a clean energy system by 2050, and is the most cost-effective way of reaching 95% emissions reductions from 1990 levels."<sup>10</sup> Further, the report finds that expanded deployment of solar and storage has the potential to create over 2 million local jobs nation-wide and save \$473 billion nationally by 2050.<sup>11</sup>

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<sup>5</sup>[https://www.eia.gov/state/analysis.php?sid=MA#:~:text=In%202019%2C%20hydropower%20s  
applied%20the,incl%20two%20pumped%20storage%20facilities](https://www.eia.gov/state/analysis.php?sid=MA#:~:text=In%202019%2C%20hydropower%20s%20applied%20the,incl%20two%20pumped%20storage%20facilities)

<sup>6</sup> Lists of Qualified Generation Units, <https://www.mass.gov/service-details/lists-of-qualified-generation-units>

<sup>7</sup> <https://www.seia.org/states-map>

<sup>8</sup> <https://www.seia.org/states-map>

<sup>9</sup> <https://pv-magazine-usa.com/2020/12/03/the-roadmap-to-the-lowest-cost-grid-is-paved-with-distributed-solar-and-storage/>

<sup>10</sup> "Expanding Local Solar and Storage could Save Ratepayers Nearly a Half a Trillion Dollars," Associated Press. <https://apnews.com/press-release/pr-newswire/business-technology-renewable-power-generation-alternative-and-sustainable-energy-energy-industry-5bf2a77f720112fe5331ecc301c3b583>

<sup>11</sup> <https://www.localsolarforall.org/roadmap>

Lastly, the report finds that increasing distributed generation-scale solar “unlocks the full potential of utility-scale solar and wind.” By helping to smooth grid demand, and therefore decreasing the need for fossil fuels, dirty power plants can be retired and in their place utility-scale solar and wind can be deployed – up to 798 GW of utility-scale solar and 802 GW of utility-scale wind by 2050 nationally, according to the report.<sup>12</sup> As the state looks to wind as a leading technology to help achieve its 2030 and 2050 goals, it should consider the critical role that distributed solar plus storage plays in supporting that deployment.

### Transmission Buildout Costs

The 2030 CECP identifies significant expansion of interstate transmission as one of the core elements of all eight pathways to Net Zero laid out in the 2050 Roadmap. The CECP explains that this expansion is needed in part to support “on-going procurement of clean hydropower via a new high-voltage transmission line,” noting that in 2018 Massachusetts selected and awarded contracts for 9.45 terawatt-hours (TWh) of hydropower via a new high-voltage transmission line. The CECP further identifies pursuit of 1 GW of new transmission to Quebec by 2030 as among the “most likely, cost effective, and technologically feasible approaches to achieve the emissions reduction expected and required by this plan,” but there are challenges and complexities with regard to transmission planning in the state which that project must traverse.

The “State of Maine Renewable Energy Goals Market Assessment” released last month, however, finds that, while hydroelectricity has been an important part of Maine’s energy mix to date, and while interstate transmission planning is important, “new Canadian hydro (under 100 MW) can be seen to be the most expensive resource available in this study, due in part to transmission costs. It... is unlikely to play a major role in satisfying Maine’s RPS requirements in the near term.” The fact that the new transmission line being built to deliver clean energy from Quebec hydropower to Massachusetts lies entirely in the state of Maine, current discourse around the transmission line to deliver Quebec Hydro to Maine itself (to say nothing of to a neighboring state) is cause for concern. These two starkly different opinions on the buildout of transmission through Maine demonstrate the challenges of overly relying upon this particular source of clean energy to reach out GHG reduction mandates.

### Better Accounting for Storage, Including Short-Duration Storage

EEA’s 2050 Decarbonization Roadmap, upon which the 2030 Plan is based, does not account for the cost savings associated with *short duration* storage. Short duration storage is generally able to dispatch and respond to market signals quickly and provide grid services that larger-scale facilities may not be able to. In examining the savings associated with distributed solar, it is imperative to account for the savings associated with DG solar paired with storage – especially short-duration storage – which plays a meaningful role in the cost savings associated with solar

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<sup>12</sup> “Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid: Results Summary” December 2020

in Massachusetts. The absence of focus on short duration storage is puzzling, as the Administration has clearly identified the value of the storage through its 2016 State of Charge Report, and through its existing policies. The CECP should build upon the foundation of the energy storage adder in the SMART program, and the Clean Peak Standard, and prioritize not only short duration storage but storage paired with clean energy resources.

Dispatch of clean energy during times of peak energy demand helps smooths system demand, reducing stress on the grid and the need for bulk-scale power, ultimately reducing need for investment in expensive “peaker” plants and firming capacity.<sup>13</sup> Smoothing system demand through solar plus storage can even help avoid the need for utility-scale generation and construction of additional transmission. All of this results in lower electricity costs.

The December 2020 “Local Solar for All Roadmap” cited above finds that “under a national 95% clean electricity target, leveraging expanded local solar and storage can save the U.S. \$473 billion by 2050 compared to a clean electricity grid that doesn’t expand local solar and storage. Expanding local solar and storage on the distribution system reduces the need for power plants that only run on peak power days. It also better manages and reduces demand on the distribution system by offering more local energy products that customers want, which can increase grid resilience and reduce overall costs on the distribution and transmission grid.”<sup>14</sup> In sum, it is critical that the benefits of short duration storage be accounted for when considering the cost saving attributes of distributed generation and what role it should play in the state’s decarbonization goals.

### **Integrated Distribution Planning is Critical to Reaching Net Zero**

If Massachusetts is to achieve the emissions reduction targets put forth in the 2050 roadmap and the 2030 CECP, it is imperative that the interconnection challenges the distributed solar industry currently faces are addressed head-on. Below are several recommendations that we believe are essential to achieving cost effective integration of renewable technologies. The adoption of these improvements to the interconnection process will not only support the deployment of additional solar PV, it will also support the electrification of the building and transportation sectors.

In order to advance the goal of “reliably operating a cost-effective, ultra-low emissions electricity grid based on variable renewable resources” the Commonwealth needs to adopt and incentivize an integrated distribution planning (IDP) approach. Utilizing a holistic planning approach for the distribution and transmission systems enables a more equitable and resilient grid. Currently, electric distribution companies (EDCs) plan for investment on the distribution system

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<sup>13</sup> “Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid: Results Summary” December 2020

<sup>14</sup> <https://pv-magazine-usa.com/2020/12/03/the-roadmap-to-the-lowest-cost-grid-is-paved-with-distributed-solar-and-storage/>

with little input or feedback from stakeholders. Utilities should be expected and encouraged to engage in innovative partnerships with stakeholders in order to advance the proliferation of variable renewable resources on the grid. Massachusetts EDCs currently submit Grid Modernization plans to the DPU every 10 years. While these plans were an important first step, a 10 year planning period quickly becomes outdated by the rapid pace of development in policy, DG and other technologies, and customer preferences. An integrated planning approach takes into account forward looking, comprehensive planning scenarios that inform investments from a more holistic perspective. As outlined in the Mid-Atlantic Distributed Resources Initiative's Integrated Distribution Planning: Guidance for Utility Commissions from April 15, 2019:

“If the nature of the proceeding is one in which a utility seeks assurances of cost recovery for distribution system investments but does not develop an IDP, there is the risk of approving utility spending on a technology that is not least-cost, least-risk, or in the best interests of customers when viewing the system as a whole. There is also the risk that a grid modernization process that is not flexible and/or restricts future course changes may impair the adoption of the most beneficial and cost-effective solutions.”

Grid modernization plans should be the outcome of an integrated distribution planning approach that identifies near-and long-term solutions to issues faced at both the customer level and at the nexus of the distribution and transmission systems. Integrated planning takes into account not only traditional resource planning needs but also more advanced aspects of resource planning such as, distributed generation, electric vehicle adoption, battery storage, energy efficiency, etc. This approach ensures outcomes that are cost effective and that provide benefits to the appropriate beneficiaries. The Commonwealth should implement policy that supports a robust, stakeholder-informed, integrated planning process.

### **Solar on Natural and Working Lands: The Need for a New Vision**

CCSA appreciates the Roadmap's recognition of the need for substantial deployment of ground-mounted solar under any circumstance in order to achieve Net Zero given that the amount of solar needed by 2050 will exceed the full technical potential in the Commonwealth for rooftop solar. Expanding upon this fact, the current Policy discussions around Land Use Change for solar deployment in Massachusetts need to evolve to achieve these goals.

The Land Sector Report explicitly does not include any analysis of ground-based solar but suggests that this is an area in which additional consideration is required. CCSA agrees that there is a need for data-driven policy in areas which impact our invaluable Natural Capital, but notes that, as outlined in our October 2019 study<sup>15</sup> the impact of solar development on the Commonwealth's land has been minimal, with only 4,100 of the 3.1MM acres of open space (0.13%) being used to that point in time – a figure that is dwarfed by non-solar commercial

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<sup>15</sup> CCSA: Shining Light on Massachusetts' Solar Land Use Trends (2019)

development, which permanently altered an estimated 70,000 acres of open space between 2001 and 2016.

Too often, in discussions around land use change, no distinction is made between the siting of solar parks and other, more drastic and permanent land use changes which irreversibly alter the soils of the land in question. A June 2019 report from the Solar Trade Association (STA) in the United Kingdom entitled *The Natural Capital Value of Solar (NCVS)* points out that “solar parks are a temporary and, in the vast majority of cases, a completely reversible land use...requiring minimal human disturbance of the grounds, and with a very small infrastructure footprint – all attributes that engender them as good areas to enhance the ecological value of the landscape,”<sup>16</sup> ultimately concluding that “short of setting aside land for conservation, land use change for solar parks arguably offers more potential than any other land use change to deliver much needed natural capital and ecosystem benefits.”<sup>17</sup> A critical distinction lies between converting land to host a solar park for 2-3 decades while preserving its ability to return to Natural or Working use in the future, and permanently altering land and its soils through other types of development.

#### The Natural Capital Value of Solar & Ecosystem Services

We are significantly behind in discussions around Land Use impacts of solar here in the US than they are in the UK, and to date, Land Use discussions in Massachusetts have only focused on two Ecosystem Services: the Regulating Ecosystem Service of Pollination and the Provisioning Ecosystem Service of Food Provision (referred to here as “Dual-Use Ag”). In the report, the STA notes that “there is a growing body of scientific evidence that well-designed and well-managed solar can support wildlife habitats and meaningfully contribute to achieving national biodiversity targets” and then goes on to discuss the solar industry’s relation to Britain’s Natural Capital stock and the Ecosystem Services that flow from them.

Natural Capital and Ecosystem Services are relatively new concepts, having arisen in 1997 and only really gained widespread attention with the UN’s Millennium Ecosystem Assessment in 2005. In the 15 years since then, there has been a growing scholarship around Ecosystem Services, and a recognition that more needs to be done to create mechanisms to establish values of them. This is a complex area of study, and one that requires the input of a broad group of stakeholders; but it is one that is required if we are to develop policies that will both enable us to radically decarbonize our energy sector and beneficially electrify while also preserving nature’s benefits for future generations.

The Land Sector Report mentioned several Ecosystem Services which Forest habitat provides, including the Provisioning Ecosystem Service of Fresh Water, the Regulating Ecosystem Services of Carbon Sequestration, Water Purification and Air Quality Regulation, the Supporting

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<sup>16</sup> Solar Trade Association: *Natural Capital Value of Solar* (2019), p. 9

<sup>17</sup> *Ibid.*, p.11



Ecosystem Services of Habitat/Biodiversity and the Cultural Ecosystem Service of Recreation. Massachusetts' Forest habitats do provide all of these (and many other) Ecosystem Services. It is important, though, to recognize that the Meadow habitat that is created by well-designed solar parks also provides a wide array of Ecosystem Services. In fact, there is a substantial amount of peer-reviewed scientific research which demonstrates the Ecosystem Service benefits that solar parks can provide to the land that hosts them and the surrounding environment; and it is through utilization of this knowledge that policy discussions can be best informed.

The Meadow habitat that is created by the development of solar parks can provide Regulating Ecosystem Services such as Pollination, Water Purification, Soil Erosion Control, Carbon Sequestration and Flood Control/Regulation. It can provide Provisioning Ecosystem Services such as Food Provision (Dual-Use Ag), Fresh Water and Genetic Resources. It can provide Supporting Ecosystem Services such as Nutrient Cycling, Habitat/Biodiversity, Soil Formation and Hydrologic Cycling...in short, there are myriad benefits to Massachusetts that solar array meadow habitat can provide; and there are tools available to policymakers and other stakeholders to understand and measure those benefits.

Unquestionably, the leading example of this is the SPIES initiative which has been undertaken by Lancaster University and the University of York: the Solar Park Impacts on Ecosystem Services<sup>18</sup> which utilizes over 700 pieces of evidence from over 450 peer-reviewed journal articles to create a web-based tool that enables the management of solar parks for environmental co-benefits in an effort to answer the question: "Can solar parks be designed, constructed and managed for environmental benefits beyond that of low carbon energy?"

The answer is an emphatic "yes", and it is one that has been fully embraced by the solar industry in the United Kingdom. A similar approach can be used here in the United States, and CCSA urges interested stakeholders to engage in an effort to develop a scientifically informed process to determine how best to meet our critical GHG reduction mandates in electricity generation while also preserving our irreplaceable Natural Capital.

#### Carbon Sequestration in Meadow Habitat

The Roadmap and the Land Sector Report both have extensive discussion of the carbon sequestration potential of the Commonwealth's Forest habitat, and CCSA acknowledges this important Ecosystem Service. It is important to emphasize in Policy discussions around Land Use in our industry that the Meadow habitat that is created when land hosts ground mounted solar PV, also sequesters carbon.

It is unquestionably true that Forest habitat and its soils sequester more carbon than Meadow habitat and its soils do; but CCSA again encourages stakeholders to consider the important differences between land use change to host a solar park and permanent, irreversible land use change such as strip malls or subdivisions which usually negate any soil sequestration potential.

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<sup>18</sup> <https://www.lancaster.ac.uk/spies/>

It is important to understand that while sequestration may decrease, it is not eradicated. In fact, scientific studies have shown that meadow habitat soils and flora can sequester as much as 30% of the carbon that Forest habitat sequesters.<sup>19</sup>

### Dual-Use Agricultural Installation Types

Food Provision is obviously one of the most important Ecosystem Services, and it is for this reason that it is critical that all stakeholders work to develop the best possible regulations around Dual-Use Agricultural solar installations.

Before discussing the various types of Dual-Use Agricultural installations, CCSA believes that it is important to ground the discussion in a realistic context given that actual lived reality of the landowners in question. The Land Use Report talks about the “tyranny of small decisions” in recognizing that it does not explicitly incorporate land ownership or landowner behavior when it notes that more than 65% of the Commonwealth’s forest are owned by individuals. While CCSA recognizes the inherent difficulty of attempting to factor those realities into the discussion, it is impossible to have a serious policy debate absent such considerations. We will speak more about this in our comments on the Built Environment, but landowner behavior (and the motivations behind it) is also a critical aspect with regard to solar on Working Lands.

CCSA believes that it is important to acknowledge that the choice is not between farms and solar arrays – the choice is between solar arrays and subdivisions, or strip malls. In short, the choice for cash-strapped family farmers is between making the gut-wrenching choice to sell land that may have been in their family for generations to a developer who will then permanently transform the land to a non-agricultural use, or to partner with a Community Solar company which will drill holes in less than 1% of the footprint of their arrays to drive temporary posts on which the panels will sit for several decades while preserving the land underneath for future agricultural use.

Given the temporary and reversible nature of land use change to support a solar park, it’s unsurprising that CCSA agrees with NECEC, who in their October 30, 2020 comments on the SMART Agricultural STGU Straw Proposal, stated that “[s]olar and agricultural land can coexist and, often, complement each other to derive the greatest financial and societal value from the land”, and encouraged DOER to utilize an inclusive and expansive view of what ought to constitute an acceptable installation.

Dual-Use Agriculture can take many forms, but each installation type falls under one of three approaches, as outlined in the National Renewable Energy Laboratory’s 2013 technical report, *Overview of Opportunities for Co-Location of Solar Energy Technologies and Vegetation*: 1) Vegetation-Centric Co-Location, which is characterized by actions that

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<sup>19</sup> USDA: Considering Forest and Grassland Carbon in Land Management (2017) General Technical Report WO-95, p. 24

serve to maximize biomass production and minimize changes to existing vegetation management activities; 2) Energy-Centric Co-Location, which is characterized by actions that serve to maximize solar energy output while also promoting vegetation growth under and around the solar installation; or 3) Integrated Vegetation-Energy-Centric Co-Location which seeks to integrate both energy output and vegetation production goals.<sup>20</sup>

NECEC went on to recognize the important Ecosystem Services that solar parks can provide:

Regardless of whether a Dual-Use Agriculture solar project installation is Vegetation-Centric, Energy-Centric, or Integrated/Hybrid, they all preserve the land for future agricultural use. Many will also improve the land through soil formation over time or provide other important Ecosystem Services to the community, whether through pollination (with the planting of native pollinator vegetation or the use of honey bees), through additional biodiversity Ecosystem Services (through other flora or man-made habitat such as bird and bat boxes) flood control or any number of other Ecosystem Service project designs. This framework is instructive in evaluating the proposed changes to the ASTGU Guideline.

Finally, CCSA believes that it is important to recognize that every farm is unique and that individual farmers will have different opinions on how best to manage and operate their farms. Policies should be designed to provide the optionality and to recognize the benefits of an array of Dual-Use solutions across all three of the Co-Location types identified by NREL, with the recognition that all of them preserve the land's soils for potential use by future generations.

### The Limitations and Challenges of Solar Development on the Built Environment

CCSA believes that wherever possible, solar should be sited on already-disturbed land, but cautions stakeholders against holding unrealistic expectations about the capacity of the built environment to host solar arrays. There are a number of factors that contribute to this, but as previously mentioned land ownership and landowner behavior are substantial impediments. It is understandable that many stakeholders to look at the large flat rooftops in our cities and industrial settings or office parks and/or the large surface parking lots and convince themselves that "this is the place to put solar". In fact, approximately 75% of the roofs in Massachusetts aren't suitable for solar through a combination of shading, orientation, pitch or an inability to support the added weight of the solar panels and/or the snow that can build on top of them.<sup>21</sup>

But understandable as they are, such opinions suffer from a lack of understanding of the underlying complexities and of the inherent challenges to effectuating such change when one considers the tyranny of small decisions which impede their idealistic solution to the question of where to site solar generation. The reality is that roofs are complicated. Buildings in cities are

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<sup>20</sup> [NREL: Overview of Opportunities for Co-Location of Solar Energy Technologies and Vegetation](#), pp. 5-8

<sup>21</sup> CCSA (2019), p.18

owned in very complicated ways which make it difficult if not impossible to make this work. It is commonplace for dedicated LLCs to be created to build or own a building, and there are often multiple independent financing entities. Attempting to get all of them to agree to making 25+ year commitments to host solar on their properties is extremely challenging, and expectations of how much solar can realistically be sited on the Built Environment should be informed by this reality.

Similar challenges manifest when considering the vast swathes of surface parking that to an untrained eye would represent an “ideal” location for solar canopy development, amplified by an additional factor: opportunity cost. A solar developer approaching a commercial property owner with an office building in a growing metropolis could highlight the potential incremental revenue in the tens of thousands of dollars per year to lease the land adjacent to their office building for 25 years, and one might think that such a proposition would be a “no brainer” for that property owner. But what would such a property owner think of that decision when 8 years into that 25-year commitment they were approached by a developer who wished to build another commercial office building on that lot and was offering \$8MM to purchase the land for that purpose?

CCSA supports building solar on the Built Environment and believes that there will be ways to overcome the increased costs and to create incentives for certain property owners to determine that it is in their interest to commit to decades'-long contractual agreements to do so; but submits that it is a vast oversimplification to simply look at the square footage of the Built Environment and calculate that 100% of it is available for solar energy production. Any serious policy discussion of the extent of solar production on the Built Environment cannot fail to account for these completely understandable limitations on its use for solar energy production.

### **Solar and Environmental Justice**

We are encouraged to see that EEA has included in its guiding principles a goal to “prioritize and anchor equity and justice to reduce burdens and increase benefits to EJ populations.” However, the CECP as written lacks enough explicit strategies and funding allocations to meaningfully benefit EJ communities across the Commonwealth.

EEA cited recommendations from its Climate Justice Working Group (CJWP) and has weaved some key policy priorities into the CECP successfully. We see additional opportunity to further the CJWP’s “people-centric” approach within the CECP. Specifically, CJWP recommended that at least 51% of funds spent under CECP implementation should be allocated to EJ populations. We urge EEA to more explicitly outline the parameters within which funding and implementation efforts will be directly passed to EJ communities in Massachusetts.

All development (not just all renewable energy development) raises siting concerns. However, we have been siting dirty fossil fuel plants in Black and Brown communities across the country for decades. This history of racist decision-making has led to disparate public health and economic impacts for communities of color and other marginalized folks, to say nothing of the

barriers that exist preventing these same populations from taking advantage of clean energy opportunities. Massachusetts can use the CECP to reverse this history and site clean energy projects in a democratic and equitable way. We can site community solar farms that not only conserve open spaces and rural landscapes, but improve soil health, carbon sequestration, and local habitats. These outcomes sound a lot better than siting dirty peaker plants next to dense population centers, but are often prevented by misplaced or misguided local opposition to critical clean energy infrastructure. If we are to reach the goals set out in EEA's CECP, we must make informed and intentional decisions about deploying clean energy in Massachusetts.

Community solar is a critical component of the clean energy transition that can specifically funnel benefits to low income and EJ communities across the Commonwealth. The CECP notes that the updated SMART program has incentivized the development of 3200MW of new solar generation, however, few projects within SMART have capitalized on provisions to serve low income customers. We look forward to DOER and DPU enabling alternative programs and urge expedited approval of those plans to meet the CECP's goals by 2030.

We know that the intersecting crises of COVID-19 and climate change will most heavily impact EJ communities in Massachusetts and across the country. CCSA and its members will continue to innovate for community solar solutions that provide resiliency, ecosystem services, and electric savings benefits to these populations. We urge EEA to explicitly outline the strategies and funding allocations that will prioritize EJ communities during the clean energy transition. In addition, we look forward to EEA's further recognition and empowerment of solutions already in place for reducing EJ communities' economic and environmental burdens.

## **Conclusion**

CCSA appreciates the hard work that EEA staff has put into the development and presentation of the Clean Energy and Climate Plan for 2030. The multi-sector approach to developing the Roadmap to achieve Net Zero by 2050 is necessary, but it cannot be minimized how increasing renewable energy generation consistently and aggressively throughout the coming decades is critical to the successful reduction of GHG emission across not only the electricity sector, but also the transportation and building sectors. Distributed solar PV has played a large role in the successes achieved in emissions reductions to date, and it will continue to be increasingly important through the coming years. It is necessary for the CECP to heighten the focus on broader deployment of PV in Massachusetts. Developing comprehensive policy for continued deployment of solar PV will be challenging, but doing so will help Massachusetts achieve a cost effective way of reducing GHG, diversifying the regions portfolio of energy resources, and ensuring Environmental Justice communities are able to access and benefit from the clean energy revolution.



**TOYOTA MOTOR NORTH AMERICA, INC.**

Sustainability and Regulatory Affairs  
325 Seventh Street, NW #1000 Washington, DC 20004

March 22, 2021

Kathleen A. Theoharides, Secretary  
Executive Office of Energy and Environmental Affairs (EEA)  
The Commonwealth of Massachusetts  
100 Cambridge St., Suite 900  
Boston, MA 02114

RE: Clean Energy and Climate Plan for 2030 – Transportation Sector

Dear Secretary Theoharides:

Toyota Motor North America, Inc. (Toyota) appreciates your leadership, the leadership of the Baker Administration, and all the hard work put in by the folks in EEA in developing the Clean Energy and Climate Plan for 2030 (2030 Climate Plan).

Transportation plays a significant role in facilitating the economy and improving the lives of everyone on this planet. As one of the world's largest full-line automakers, we recognize that we have a leading role to play in developing and offering sustainable mobility solutions.

We have several comments to the 2030 Climate Plan, especially Chapter 2, "Transforming our Transportation Systems" (Chapter 2), but in order to put those comments into context it is important to understand Toyota's overall approach to future powertrains and the need to consider the consumer in the overall strategy. We hope this background and context will help make our comments more clear.

*TOYOTA'S ELECTRIFICATION STRATEGY*

Toyota is committed to vehicle electrification and has been researching and developing electrified powertrains since the early 1990s. This commitment produced the 1997 launch of the pioneering Prius, Toyota's first mass-market hybrid electric vehicle (Hybrid), and the 2014 launch of the trailblazing Mirai, Toyota's first mass-market fuel cell electric vehicle (FCEV). To date, Toyota has sold over 14.3 million electrified vehicles globally, and helped reduce over 100 million tons of vehicle CO<sub>2</sub> emissions. Here in the U.S., since 2008 we've sold over 3.6 million Hybrids, which has saved more than 7.6 billion gallons of fuel and prevented 68 million tons of CO<sub>2</sub> from entering the atmosphere. We are also leaders in zero-emission technologies, such as fuel cell electric powertrains, and have made huge strides in the development of next-generation batteries, such as solid-state batteries, which will power tomorrow's cars.

## MEETING CONSUMERS' NEEDS – A PORTFOLIO APPROACH TO ELECTRIFICATION

The introduction of new technologies presents daunting challenges for retail and commercial consumers and consumer adoption. The purchase of a new vehicle represents a significant investment of both money and time for consumers. The selection of a vehicle is intensely personal as consumers factor in branding, where it's made, safety, image, utility, durability, range, fueling, cold-weather performance, economics, all-wheel drive, car vs. SUV, re-sale value, and, of course, environmental attributes. In addition, commercial, fleet, and heavy-duty customers place emphasis on having the right tool for the job (recognizing there are many jobs or duty cycles), minimizing downtime, and optimizing total cost of ownership. Consumers see the benefits of an electrified future but require more confidence to improve their comfort level with the technology before they make that investment.

No matter how environmentally friendly a car is, it cannot contribute to reducing the environmental burden unless it is widely used. We recognize that the infrastructure, energy policies, consumer preferences, and natural environments that vehicles operate in vary from region to region and from state to state. As a result, we promote the widespread use of environmentally-friendly vehicles by taking a portfolio approach and offering consumers a wide range of choices. These include Hybrids, plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs), and FCEVs.

Hybrids – Recognizing that not every consumer has convenient access to zero-emission vehicle charging or fueling infrastructure, Toyota has expanded its Hybrid powertrain offering beyond the Prius to other Toyota and Lexus vehicles, including the Toyota Corolla, Camry, Avalon, RAV4, Highlander, and Sienna; and the Lexus ES, UX, NX, RX, LS, and LC. Toyota expects Hybrids to play an important role in helping the Commonwealth achieve its goals of reducing carbon emissions from the transportation sector.

Toyota's top-selling 2020 RAV4 Hybrid (41 mpg city / 38 mpg highway), which costs consumers \$850 more than the non-hybrid version<sup>1</sup>, has a range of 580 miles<sup>2</sup>, which will allow it to travel from Portland, ME, to Washington, DC, without needing to stop for gas. Toyota's recently launched, all-new 2021 Sienna minivan will be offered in Hybrid only; and have an all-wheel drive option, a combined 35 mpg for the AWD option, and a 3,500 lb. towing capacity.<sup>3</sup>

And there's more to come. We believe Hybrids will serve your citizens in all areas of the Commonwealth, including its cities and more rural areas.

PHEVs – Toyota introduced plug-in hybrid technology with the Prius Prime in 2012, and today, it makes up 30% of total Prius sales. We think plug-in hybrid technology will make a great option for consumers transitioning from Hybrids to full battery or fuel cell electric. Consumers can rely on the battery until it is depleted, and they don't have to stop and charge because the internal combustion engine kicks in. In July 2020, Toyota launched the RAV4 Prime, a plug-in hybrid

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<sup>1</sup> <https://s3.amazonaws.com/toyota-cms-media/wp-content/uploads/2019/10/2019-2020-Toyota-Pricing-MASTER-10.18.19.pdf>

<sup>2</sup> <https://www.fueleconomy.gov/feg/Find.do?action=sbs&id=42187>

<sup>3</sup> <https://www.fueleconomy.gov/feg/noframes/43471.shtml>

version of our RAV4 SUV<sup>4</sup>. The RAV4 Prime, launched as a 2021 model year, comes with standard all-wheel drive; and has an all-electric range of 42 miles, 302 horsepower, and a 0-60 time of 5.7 seconds, making it the second quickest in Toyota's lineup behind the Supra.

BEVs – Toyota announced plans to offer more than 10 BEV models globally by the first half of the 2020s. Starting with a rollout in China in 2020, these vehicles will be available to other countries to meet market demands. Right now, BEVs make up just over 1% of the entire North American market. Toyota believes there is potential for more growth over the next 10 years as anticipated improvements in vehicle range and charging times, availability of charging stations, and reductions in costs materialize. Toyota is developing partnerships with battery manufacturers, global research universities, suppliers, and other automakers to facilitate innovation and make these vehicles affordable.

FCEVs – We believe that FCEVs have the potential to be the powertrain for the next 100 years and are committed to the global deployment of these innovative, safe, reliable, scalable, and efficient ZEVs. In December 2020, Toyota launched the next generation Mirai<sup>5</sup>, which is a sleek, mid-sized, four-door, five-passenger sedan. The next generation Mirai XLE has a range of 402 miles, an MPGe of 72, and a refueling time of less than five minutes.<sup>6</sup>

FCEVs are electric vehicles and get their fuel from a distributed network of fueling stations, like gasoline vehicles do today. Drivers can fill up in less than five minutes and travel approximately 400 miles on a full tank. This makes zero-emission vehicles accessible to more consumers like those that do not have the access or the ability to install a home-based electric vehicle charging system – these include customers living in apartments, rentals, and high-density urban environments.

FCEVs like the Mirai perform well in a variety of climates. Compared to other zero-emission powertrains, fuel cell electric powertrains are less susceptible to problems associated with cold weather such as start-up, charging/fueling, power, and range. The current generation Mirai fuel cell stack is designed to perform at temperatures down to -22°F and achieves full power in less than a minute.

Hydrogen fueling stations can easily be built to refuel multiple vehicles at one time. What's more: hydrogen fueling infrastructure does not require significant investment in power infrastructure, is not as real estate-intensive since a single hydrogen dispenser can support over 300 cars, and provides current convenience-store owners and gas station operators with an opportunity to participate in the clean-energy transformation.

Since the Mirai's introduction in 2015, California's retail hydrogen fueling infrastructure has grown from single digits to 44, allowing for the sale of more than 6,500 Mirai. Together with FCEVs from Honda, Hyundai, and Mercedes, there are over 9,000 FCEVs on the road in California. California is well on its way to establishing a robust hydrogen infrastructure. In addition, the governments of China, Germany, and South Korea have taken significant steps to promote the

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<sup>4</sup> <https://pressroom.toyota.com/2021-toyota-rav4-prime-primed-and-ready-for-electrified-traction/>

<sup>5</sup> <https://global.toyota/en/newsroom/toyota/29933463.html>

<sup>6</sup> [https://www.fueleconomy.gov/feg/fev\\_sbs.shtml](https://www.fueleconomy.gov/feg/fev_sbs.shtml)



purchase of FCEVs (from forklifts to passenger cars to buses and trains) and the development of hydrogen fueling stations. We believe that the Commonwealth is positioned to lead the expansion of this new clean technology to the east coast of the U.S.

The largest constraining factor facing widespread FCEV adoption is the lack of hydrogen fueling infrastructure. In the northeast, to mitigate this initial hurdle, Toyota is working with Air Liquide to develop a network of 12 hydrogen fueling stations<sup>7</sup>. However, 12 stations in a region as diverse and populous as the Commonwealth will not be enough.

One very significant attribute of fuel cell electric powertrains is its scalability. Fuel cell electric powertrains provide the flexibility and capability to cover more demanding use cases such as buses, ferries<sup>8</sup>, medium-duty vehicles, heavy-duty class 8 tractors<sup>9</sup>, ground support equipment, cargo handling equipment, utility tractor rigs<sup>10</sup>, fork trucks, and even rail<sup>11</sup> and ships. Fuel cell electric powertrains scale advantageously to longer ranges, quicker fueling, better packaging, heavier cargo capacities, higher infrastructure throughput, and more profitable uptime allowing for a more favorable overall total cost of ownership. The greater the mobility need, the more benefits FCEVs bring.

Hydrogen fueling infrastructure can also be more economic to scale to medium- and heavy-duty consumption levels due to leveraging of industrial hydrogen availability and freedom from grid constraints.

While some see the tremendous potential for fuel cell electric in medium- and heavy-duty commercial applications, and ask why fuel cell is needed for light duty, we want to point to a synergistic relationship that exists between fuel cell for light duty and fuel cell for heavy duty. Heavy duty vehicles drive high levels of continuous consumption of hydrogen allowing for the scaling of fueling infrastructure and bringing down the cost of fuel, while light-duty vehicles drive high volumes of manufacturing of fuel cell electric powertrains, bringing down the cost of the powertrain. Having both will provide for greater reductions in cost and greenhouse gases.

#### *COMMENTS TO THE CLEAN ENERGY AND CLIMATE PLAN FOR 2030*

Representatives from Toyota have attended nearly all the public workshops and webinars hosted by the Commonwealth regarding your deep decarbonization plans and the Transportation Climate Initiative. Below are our comments specific to Chapter 2 of the 2030 Climate Plan.

Hydrogen, Fuel Cell, and Future-proofing – Toyota supports many of the efforts discussed in Chapter 2, from the Commonwealth’s leadership in TCI, to the establishment of a Low Carbon Fuel Standard, to the MOR-EV program. However, we observe that Chapter 2 is very focused on PHEVs and BEVs, and want to re-emphasize that FCEVs are not only zero-emission vehicles, but also electric vehicles. As previously noted, Toyota is working with Air Liquide, and we are

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<sup>7</sup> <https://www.toyota.com/usa/environmentreport/carbon.html>

<sup>8</sup> <https://ggzeromarine.com/projects/>

<sup>9</sup> <https://global.toyota/en/newsroom/corporate/24582088.html>

<sup>10</sup> <https://pressroom.toyota.com/toyota-and-fenix-demonstrate-first-hydrogen-fuel-cell-electric-utr/>

<sup>11</sup> <https://www.alstom.com/our-solutions/rolling-stock/coradia-ilint-worlds-1st-hydrogen-powered-train>

actively developing an initial network of hydrogen fueling stations in the Commonwealth to enable a launch of FCEVs in the east coast from the Commonwealth. We seek to be a part of the solution. There is a great deal of activity in the hydrogen and fuel cell space, and we encourage the planning efforts of the EEA to be flexible and nimble, and include hydrogen fuel and fuel cell electric powertrains for all vehicles from light duty to heavy duty, as these energy systems and technologies mature and become commercially available in the time period covered by this 2030 Climate Plan.

ZEV Charging Infrastructure – The Commonwealth should consider investing into BEV charging and FCEV fueling infrastructure. Toyota acknowledges that states have historically not played a role in supporting the development of gasoline and diesel fueling stations and that the Commonwealth may wonder why they need to play a role now. However, the charging and fueling infrastructure required to support these zero-emission powertrains are still in early stage and not yet prevalent. Station grants would facilitate the proliferation of fueling points, which would provide comfort to consumers to adopt a new technology, drive scale, and bring down the cost of fuel. Toyota recognizes that there is already some momentum around charging infrastructure for PHEVs and BEVs. However, it is critical to also support the deployment of fuel cell powertrains considering their unique advantages for certain retail and commercial consumers. In addition: hydrogen has the potential to provide energy storage and electricity grid augmentation, does not require significant investment in power or natural gas infrastructure, is not as real estate-intensive since a single hydrogen dispenser can support over 300 cars, and provides current convenience-store owners and gas station operators with an opportunity to participate in the clean energy transformation.

Funding support for commercial ZEVs and pilot projects – The Commonwealth should consider funding into commercial ZEV pilot projects. Electrification of medium- or heavy-duty transport, i.e., Class 8 drayage, and related charging / fueling remain challenging and tend to have higher initial costs. Furthermore, commercial vehicles tend to produce significant quantities of greenhouse gas, NOx, and fine particulate emissions, and operate in environmental justice communities. Grant-funded pilot projects would allow participants and stakeholders to put skin in the game to develop the appropriate technologies and business models.

## *CLOSING*

Toyota supports the work of the Commonwealth to create a holistic program to reduce and eliminate greenhouse gases. We appreciate the opportunity to comment on the 2030 Climate Plan and look forward to our continued conversations with the Commonwealth and EEA to reduce carbon emission from the transportation sector.

Sincerely,



Robert Wimmer  
Group Manager, Energy & Environmental Research,  
Sustainability & Regulatory Affairs, Toyota Motor North America, Inc.  
Member, Massachusetts ZEV Commission



**THOMAS A. GOLDEN, JR.**  
16TH MIDDLESEX DISTRICT

*Commonwealth of Massachusetts*

HOUSE OF REPRESENTATIVES  
STATE HOUSE, BOSTON, MA 02133-1054

CHAIRMAN  
Committee on Telecommunications,  
Utilities and Energy

ROOM 473-B, STATE HOUSE  
TEL: (617) 722-2263  
Thomas.Golden@MAhouse.gov

February 10, 2021

Secretary Kathleen A. Theoharides  
Department of Energy Resources  
100 Cambridge St., Suite 900  
Boston, MA 02114

**RE: COMMENTS ON THE 2030 CLEAN ENERGY AND CLIMATE DRAFT PLAN**

Dear Secretary Theoharides:

I would like to congratulate you, your staff, and Governor Baker on developing the new 2030 Clean Energy and Climate Draft Plan, and thank you for the opportunity to offer comments on the plan before it is finalized.

As both the 2030 Draft Plan and the 2050 Decarbonization Roadmap state, it is vital that we are able to reliably operate a cost-effective, ultra low-emissions electricity grid as we decarbonize our economy. Bulk storage is mentioned in both reports as a potential strategy to enhance reliability (among other technologies and investments), and I want to highlight the need to further examine opportunities and barriers for large-scale, longer duration storage.

As ISO-New England notes in its 2020 Regional Electricity Outlook, the region currently benefits from 2,000 megawatts of large-scale hydroelectric energy-storage facilities,<sup>1</sup> which make up an important component of the “flexible, responsive, and reliable electric grid” that the Baker-Polito Administration envisions. In addition to these pumped storage resources, ISO-NE notes that the region needs more long-duration energy storage resources to balance the variability of renewable generation and fill in weeks-long “energy gaps,” such as the 2017/2018 winter cold snap.

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<sup>1</sup> ISO-New England, [2020 Regional Electricity Outlook](#), page 29.

While pumped storage and other long-duration energy storage resources hold great promise for the New England grid, they currently face barriers to full utilization. For example, one pumped storage facility, Northfield Mountain, operates at less than 30 percent of its potential because its unrealized value in reducing carbon emissions is not fully priced into ISO-NE's energy dispatch.<sup>2</sup> If incentives were crafted to allow even two of Northfield Mountain's four pumped-storage hydroelectric units to operate during periods of highest-cost electricity between 2022 and 2030, ratepayers in the Commonwealth could save up to \$220 million; 875,929 metric tons of CO2 emissions could be eliminated; and wintertime natural gas consumption could be reduced by 0.5 to 4.1 percent, improving regional energy security.<sup>3</sup> Further, grid-scale storage technologies, like liquid flow batteries, aim to provide storage solutions that can discharge for 10 to 100 hours. Companies in this space, however, struggle to remain solvent or to deploy substantial commercial projects. Further analysis and support is needed to determine how to assist these technologies in becoming commercially viable.

In an effort to address these challenges, the House included Section 20E in H.4933, *An Act creating a 2050 roadmap for a clean and thriving Commonwealth*, passed by the House in July 2020. Although not included in the final conference committee report, this feasibility study would have tasked DOER, MassCEC, and the Carbon Reduction Research Center (CRRC) with identifying current deployment levels and potential incentives to harness the full benefit of current resources and determining steps that could be taken to bring longer-term solutions closer to commercialization. The CRRC's primary focus of carbon reduction research, along with its access to the expertise of the Emerging Technologies and Innovation Center and state-of-the-art facilities and professors at the University of Massachusetts Lowell, make it an invaluable partner in this much needed effort.

To that end, I would like to respectfully request that the 2030 Clean Energy and Climate Plan include a long-duration energy storage feasibility study conducted by the Department of Energy Resources, the Massachusetts Clean Energy Center, and the Carbon Reduction Research Center. The Department may find Section 20E of H.4933 instructive for potential areas of focus for such a study.

I would once again like to applaud the important work of you and your staff on developing the 2030 Clean Energy and Climate Plan draft, and thank you for the opportunity to offer the above comments as you work to finalize a comprehensive final plan to help drive the Commonwealth forward towards a clean transition.

Sincerely,

A handwritten signature in blue ink, appearing to read "T.A. Golden, Jr.", written in a cursive style.

**THOMAS A. GOLDEN, JR**  
*State Representative*

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<sup>2</sup> M. Fonseca-Guzman, Z. Traverso, E. Agar, C. Niezrecki, H. Mack, & A. Smith-Walter, *The State of Grid Energy Storage in Massachusetts* (UMass Lowell & Associated Industries of Massachusetts, 2019)

<sup>3</sup> June 2020 report by Energyzt Advisors LLC, commissioned by FirstLight Power



## Northeast Hearth, Patio, and Barbecue Association

PO Box 28, Sudbury, MA 01776 . 978-443-0344 . [nehpba.org](http://nehpba.org)

March 10, 2021

Comments to Executive Office of Energy and Environmental Affairs on the Interim Clean Energy and Climate Report for 2030:

Northeast Hearth, Patio & Barbecue Association (NEHPBA) is a trade association representing more than 300 individual member retail and related companies throughout the Northeast. These are our region's chimney sweeps, installers, maintenance companies, and any other entity having a commercial interest in the hearth, patio and/or barbecue industry, including—but not limited to—gas utilities, publications, testing laboratories, insurance agencies, financial institutions, business systems providers, advertising agencies, public relations firms, and so much more. Specifically, in the Commonwealth of Massachusetts, we have over 50-member companies supporting over 350 families—the vast majority of these are independent “mom and pop” shops -- small businesses who are significant community contributors in the markets they serve across the Commonwealth. The elimination of gas in new construction will imminently put our member retailers and the associate businesses related to them, such as chimney sweeps and installers, out of business.

NEHPBA recognizes the changing landscape of the energy and fossil fuel industry. We are committed to working with government officials and regulators at all levels to increase access to more sustainable and climate centric fuel sources throughout our homes and businesses. However, moving immediately to a Net Zero model could result in skyrocketing electric rates and potentially inhibit access to more affordable sources of fuel and power—negatively impacting small businesses.

The NEHPBA members offer the following comments to the Massachusetts Clean Energy and Climate Plan for 2030:

- NEHPBA is concerned with the eight pathways, which analyzes potential annual energy supplies. If systems that use fossil fuels are replaced, it could cause a major price expansion.
- Regarding the CECP claims on population growth in Massachusetts: Massachusetts presently has negative migration, with commercial real estate vacancies in Boston being highest in the country for the first time in its history. The 2017 population statistic is irrelevant in 2021. According to the Pioneer Institute study: “Do The Wealthy Migrate Away From High-Tax States? A Comparison of Adjusted Gross Income Changes in Massachusetts and Florida” – “Over time, migration has significantly affected not only the growth of total state AGI, but also state population. Since 2000, the number of births in Massachusetts has steadily declined, while deaths have remained stable or grown. The result is that the Commonwealth is increasingly reliant on migration to continue to expand its tax base and pay for the health care and retirement benefits of a rapidly aging population. While the state's population is still growing, migration within the United States has seen Massachusetts shedding residents every year since 2011. At one point in the mid-2000s, 50,000 more Massachusetts residents moved to other states every year than those who moved from other states to Massachusetts.”
- NEHPBA is concerned with the reports “transforming buildings sector overview”. The last sentence says: “...with longer and colder winters leading directly to more combustion of fuel, oil, propane and natural gas for space heating”. In comparison to the most recent webinar recording on the 2050 Climate Roadmap, it was stated that “heat pumps will work because the winters in MA are getting warmer”, these statements seem to contradict themselves. The optimal temperature range for a conventional air source heat pump operation is above 25 to 30 degrees Fahrenheit. Relying on the effectiveness of heat in cold weather is unconventional and the performance would be insufficient. The only mention of “other clean heating solutions” are heat pumps, are there any other solutions?
- NEHPBA is concerned with the “Getting to 45% in 2030: ~ 9.4 MMTCO<sub>2</sub>e Reduction” section. This kind of urgency and immediacy will drive up costs of housing. Recently, the New Jersey Builders Association (NJBA) studied the impact of that state's net zero energy plan on new single-family home construction. The total added cost—excluding electric vehicle (EV) charging—to construct a typical single-family home was more than \$83,500. These cost increases do not account for increased electricity costs as a result of grid transmission and new or upgraded distribution infrastructure.



Hearth, Patio & Barbecue Association Affiliate



## Northeast Hearth, Patio, and Barbecue Association

PO Box 28, Sudbury, MA 01776 . 978-443-0344 . [nehpba.org](http://nehpba.org)

- NEHPBA is concerned with your B1 and B2 Strategy Actions. Immediately removing fossil fuels from newly constructed residences would effectively destroy these small, locally owned businesses. As well as raise the cost to build a typical 2,400 sq. ft., two-story, net zero energy home.
- NEHPBA is concerned with using a phased-in approach that allows Green Communities to opt-in to a new high performance stretch energy code starting in 2022. At a time when the Commonwealth is already in an economic recovery facing high housing costs and low supply—net zero “stretch energy codes” will dramatically slow housing construction, increase costs in one of the most expensive regions of the country, and jeopardize financing access to homebuyers.

Thank you for your consideration of our comments. We strongly encourage continued engagement by Executive Office of Energy and Environmental Affairs to mitigate these concerns. Please do not hesitate to contact me at (978) 443-0344 or via email at [Karen@NEHPBA.org](mailto:Karen@NEHPBA.org) with any questions.

Sincerely,

Karen L. Arpino  
Executive Director  
Northeast Hearth, Patio & Barbecue Association



CITY OF SOMERVILLE, MASSACHUSETTS  
JOSEPH A. CURTATONE  
MAYOR

March 17, 2021

Kathleen Theoharides, Secretary  
Massachusetts Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

Dear Secretary Theoharides,

Thank you for the opportunity to provide comments on the Commonwealth's Interim Clean Energy and Climate Action Plan for 2030 (CECP). This plan is an important step for the Commonwealth to make actionable progress towards net-zero carbon emissions by 2050 and includes many strategies that align with Somerville's climate action plan, Somerville Climate Forward. As the first municipality in the Commonwealth to set an economy-wide carbon neutrality goal, Somerville is a ready partner in meeting our state's climate challenges. Achieving the science-based target of net-zero emissions by 2050 will require transformation across Massachusetts, and the interim CECP includes many laudable strategies necessary for this transformation, including the adoption of ZEV purchase and sale mandates, the investment of TCI revenue in transit improvements for overburdened and underserved communities, the development of a passive-house level high-performance stretch code by 2022, the elimination of Mass Save incentives for fossil-fuel systems, an emissions cap on heating fuels, strategies to strengthen the deployment of wind and solar, and regulation of HFC sales.

While there is much to be celebrated in this plan, there are several areas that would benefit from additional research, analysis, and refinement before the plan is finalized. First, the final CECP would benefit from a more explicit focus on equity and environmental justice, with details on how the strategies will drive equity. Equity is not the same as equality, and therefore we need differentiated approaches for the varying needs of Massachusetts communities. The final CECP should include specific strategies that address the unique challenges of urban, suburban, and rural communities across the Commonwealth to ensure that all are able to benefit from the transition to a carbon free future. Second, the implementation of this plan will require dedicated agency capacity and increased funding. The final CECP should include specific recommendations for how the strategies will be implemented and how funding will be allocated. Municipalities like Somerville have been leading the way on climate action in Massachusetts, but we need financial, legislative, and programmatic support from the state for the transformational change that is needed.





## Transportation

The Interim CECP contains no specific strategies about public transportation. This is a glaring and problematic omission. Public transit is essential for reducing emissions from transportation and making our communities more livable and equitable. A statewide climate plan that does not include strategies to strengthen public transit will be a failure. Electrification of passenger vehicles and telecommuting do nothing to address the inequities of transit access. For example, bus riders in Somerville are disproportionately low income and people of color. I urge EEA to add a strategy dedicated to public transit with commitments to maintain, expand, and electrify public transit systems. The transportation solutions cannot and should not be a one-size-fits-all approach and transit must be prioritized for urban and suburban areas.

The transportation section of the CECP relies heavily on vehicle electrification. In Somerville, we recognize the need for transportation electrification and are pleased to see EEA committing to setting a ZEV standard to match California. This mandate will set clear expectations and will spur innovation. As a whole, however, the electric vehicle (EV) strategies in the interim CECP do not provide enough support for the EV transition in urban areas. Expanding MOR-EV rebates is an important step, but without funding for urban charging solutions, it will result in inequitable distribution of those funds to suburban areas with higher concentrations of single-family homes, where at-home charging is more accessible. In urban areas like Somerville, municipalities are forced to bear the burden of installing and maintaining public charging infrastructure for residents who are unable to charge at home (i.e., renters and those in multifamily housing). The final CECP should include explicit solutions and dedicated funding to support neighborhood-based, public charging for urban residents. Furthermore, the CECP should consider Level 2 charging in addition to DCFC as a viable option for public charging in urban settings. Finally, we support the inclusion of a revision to rate structures for EV charging and urban delivery and fleet electrification pilot programs in the Interim CECP.

## Buildings

Over past several years the City of Somerville has advocated for the creation of a net-zero stretch energy code. Therefore, we strongly support the inclusion of commitments to develop a high-performance stretch code in line with passive-house standards in time for adoption by 2022, and we recommend that EEA include commitments to incorporating electrification in that code to push it as close to net-zero emissions as possible. Somerville would be eager to be one of the first communities to opt into this new high-performance code, helping to prove the feasibility of a more stringent code and demonstrating the capacity of the development, construction, and real estate industries to create net-zero buildings. The development of a net-zero emissions code is absolutely essential to the success of meeting the Commonwealth's climate goals. It is therefore critical to maintain the timeline for code adoption in the CECP.







In Somerville, we are proving that high performance standards do not slow development. We have seen significant interest in our residential net-zero density bonus, which allows developers to build more units in exchange for committing to Passive House certification and no fossil fuel combustion for HVAC and cooking. We know that full electrification in most building types is achievable and cost-effective when coupled with efficiency. It is imperative that energy codes include electrification requirements to prevent further lock-in of fossil fuel systems in buildings constructed over the next decade. I recommend that the final CECP include more specifics on the parameters for the high-performance stretch energy code including electrification.

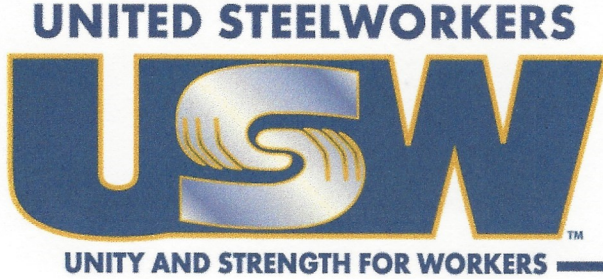
The final CECP would benefit from more specifics on how the targets for heat pump deployment will be met, in particular how multifamily and rental properties will be included in the programs. While increasing incentives and outreach are welcome improvements, specifically designed programs will be needed to overcome the challenges that multifamily and rental properties face in accessing efficiency and electrification improvements. In addition, EEA should consider mandatory requirements for clean heat replacements and efficiency retrofits during renovation or system replacement instead of solely relying on market transformation. We support the phasing out of fossil fuel heating incentives and encourage even faster elimination of incentives for fossil fuel systems to avoid lock-in. The final CECP should provide detailed programmatic changes to Mass Save that set an ambitious baseline for the next three-year cycle, specifically offering detailed whole-building solutions for renter-occupied buildings. Finally, we support the adoption of a declining emissions cap for heating fuels by 2023. This strategy would be strengthened with the inclusion of additional fuel-specific targets and timelines for fossil-fuel phaseout in the final CECP.

Thank you for the opportunity to provide this feedback.

Sincerely,

Joseph A. Curtatone, Mayor





March 16,2021

**Written Comments of John Buonopane**

My name is John Buonopane I am a Staff Representative for The United Steelworkers Union. The USW represents over two thousand people employed with gas utility companies throughout the State of Massachusetts. Our members have a number of concerns with the CECP plan:

- **The plan almost completely eliminates the utilization of Natural gas as an energy source:** Natural gas is the most abundant and cost-effective energy source available. The impending completion of new pipeline systems and the developing clean end use technology will make gas a safer, cleaner part of our states diverse energy supply.
- **The plan includes the implementation of "Stretch codes":** Stretch code requirements will exclude a consumer's ability to utilize cost effective natural gas as a fuel source in their homes and businesses. Stretch codes would also require home and business owners to make costly heating and water heating conversions.
- **The plan does not sufficiently address the utilization of the existing gas pipeline systems:** The gas pipeline systems throughout the State are all currently in the process of being replaced with new polyethylene piping. The plan does not adequately address the potential use of the new pipeline systems using alternative fuels like hydrogen and renewable natural gas.
- **The plan relies almost exclusively on the electrification of energy end users to reach its goals:** The reliance on complete electrification could leave the commonwealth without a sufficient electric generation capacity which is expected to more than double by the year 2050.
- **The plan does not protect the thousands of employees who are dependent on Natural gas for their livelihoods:** There is no real effective path laid out within the CECP plan to help the Commonwealths diverse workforce evolve with the evolution of the energy market and the planned goals to reach net zero.

We appreciate your attention to our concerns. We look forward to helping our fellow citizens do anything we possibly can to achieve a cleaner and diverse energy portfolio that works for everyone.

Respectfully,

John Buonopane  
USW Staff Representative  
USW District 4  
100 Medway Road Suite 403  
Milford, MA 01757

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United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union

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UNION LABEL 3657

## **Introduction**

Green Energy Consumers Alliance (“Green Energy Consumers”) is a non-profit organization with a mission to harness the power of energy consumers to speed the transition to a low-carbon future. Since 1982, we have run a series of programs and services for residents of Massachusetts to enable smart energy choices. The experience we’ve gained interacting with energy consumers and suppliers informs our advocacy work at the state and local level.

We commend the Commonwealth for the ambition in its interim 2030 Clean Energy and Climate Plan (“2030 CECP” or “the Plan”) and thank you for the opportunity to submit the following comments. We applaud the Commonwealth for including several strategies that, from our perspective, will do the most to move the needle on reducing carbon emission in the next decade, specifically:

- Increasing the Clean Energy Standard to at least 60% by 2030;
- Implementing the Transportation Climate Initiative;
- Creating a Low Carbon Fuel Standard;
- Adopting California’s Advanced Clean Car regulations in order to put one million electric vehicles (EVs) on the road by 2030;
- Establishing a Heating Fuels Emissions Cap.

Although there are many possible paths to net zero by 2050, all models agree that investing in energy efficiency, electrifying heating and transportation, and bringing renewables onto the grid—especially through offshore wind development—are essential by 2030. The strategies in the CECP are fundamental to progress in the years ahead. Our organization stands ready to work with the Executive Office of Energy and Environmental Affairs (EOEEA) on the public processes regarding the development and implementation of the policies and regulations.

In preparing these comments, we have reviewed the Massachusetts 2050 Decarbonization Roadmap (“2050 Roadmap”) and its supporting technical reports in addition to the interim 2030 CECP. Our comments follow the structure of the 2030 CECP and are divided into three sections: Transportation, Buildings, and Electricity Supply. Before diving into specific strategy categories, we would like to offer the following over-arching comments on the 2030 CECP:

### ***1. Emissions reductions are too backloaded to the end of the coming decade.***

Across the 2030 CECP’s Strategy Actions, we find that the emission reductions are backloaded to the years 2025-2029, which poses a considerable risk that the Plan’s emissions reduction target of 45% by 2030 will not be achieved. This concern is exacerbated by the legislature’s intent to raise the emission reduction to 50% by 2030 and to require a new limit to be set for 2025 in “An Act creating a next-generation roadmap for Massachusetts climate

policy” (“the climate bill”). We strongly support both of those provisions in the climate bill, believe they are feasible and appropriate, and recommend that they be incorporated into the final 2030 CECP.

As we make specific recommendations on various Strategy Actions, we will point out which ones appear to be on a schedule that is most at risk for non-achievement. While the Plan might serve well as a guidance document, the regulations required to carry out the Plan need to be promulgated at a pace that might be unusually fast for state government.

***2. The Plan lacks specificity in key Strategy Actions.***

The number of instances in which words the Plan uses words such as “explore” and “investigate” concerns us. In some of those cases, we would urge the Plan to declare a firm commitment because the stated policy makes obvious good sense. In other cases, our ability to express support or opposition is hindered until we see more detail.

***3. The Plan should more fully consider equity implications in addition to greenhouse gas emission reductions, particularly in the area of public transit.***

The area in which we deem the Plan to be the most deficient has to do with a surprising lack of expressed support for public transportation. The Transportation and Climate Initiative (TCI) offers funding that could greatly help boost our regional transit authorities. The benefits of doing so are clear – increased mobility for people who need buses and trains to get to work and reduced localized air pollution, public health impacts, vehicle miles traveled in cars, and greenhouse gas emissions. Investing in public transportation, in addition to reducing greenhouse gas emissions, is a key strategy to support communities currently overburdened and underserved by our transportation systems.

***4. The Plan should consider changes at the federal level.***

Finally, we question whether the 2030 CECP and the 2050 Roadmap adequately incorporate the impact of federal policies that we can expect from the Biden administration and significant changes to the Congress. These policies will raise both the floor and ceiling for what we can accomplish here in Massachusetts. The more we lean into clean energy, the more likely we will be able to capture federal incentives, and the more our Commonwealth will benefit.

## **Transportation**

The 2030 CECP rightly identifies the transportation sector as a major opportunity – and challenge – for emissions reductions in the next decade. We applaud the Commonwealth for setting ambitious targets and for recognizing the enormous role that electrification will play in meeting these targets. Though electrification is a critical piece of the puzzle, expanding and electrifying public transit should be prioritized more than the 2030 CECP suggests,

especially to equitably distribute the benefits of this clean energy transition, and the Plan in general should put greater emphasis and offer more specificity on *early* action to avoid backloading emissions reductions until the latter half of the decade. The comments that follow expand on these over-arching points by strategy.

As we go through the transportation strategies, it's important to remember the value of the benefits provided by electrifying transportation. Every additional electric vehicle (EV) on the road in Massachusetts provides energy savings to the driver (whether an individual, a business, or transit agency), a resource to help reduce the costs of maintaining our electric grid, and local public health benefits, in addition to greenhouse gas emission from which we all benefit. And, as both the 2030 CECP and the 2050 Decarbonization Roadmap study explain, we send dollars out of state when we import petroleum but keep dollars in-state and in-region when we electrify. These benefits add greater urgency and purpose in setting a target of one million EVs by 2030. However, we will not reach that target on time unless we implement policies soon.

## **Strategy T1: Cap Transportation Sector Emissions and Invest in Clean Transportation Solutions**

### ***1. Specify via a third "Strategy Action" how TCI-P revenue will be invested and how investment decision will be made.***

We support the Transportation & Climate Initiative program (TCI-P) and applaud the Commonwealth for its work in leading the development of this regional program to reduce greenhouse gas emissions from the transportation sector. We understand that how revenue from this initiative will be invested in Massachusetts is to be determined by an open and public process. In addition to committing to implementing TCI-P in 2023 via a "Strategy Action," we encourage the Commonwealth to list a "Strategy Action" detailing the process and timeline for public engagement and investment decisions.

### ***2. Create a "Strategy Action" to begin the TCI-P equity work earlier than 2023.***

In signing the final regional Memorandum of Understanding for TCI-P, the Commonwealth agreed to invest a *minimum* of 35% of program proceeds to "overburdened and underserved communities" and to "establish and support an Equity Advisory Body... composed of diverse stakeholder groups, with a majority of members being representatives of overburdened and underserved communities or populations to advise on decision making and equitable outcomes for TCI-P."<sup>1</sup> The work of this Body need not wait until 2023; in fact, the Commonwealth and the "overburdened and underserved communities" TCI-P hopes to

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<sup>1</sup> See p. 3 of the final MOU, available at:

<https://www.transportationandclimate.org/sites/default/files/TCI%20MOU%2012.2020.pdf>.

support would be better served by beginning this work intentionally, thoughtfully, and proactively before 2023.

**3. Provide more specificity about the proposed regional Low Carbon Fuel Standard.**

Strategy T1 directs the Massachusetts Department of Environmental Protection (MassDEP) to develop and implement a regional Low Carbon Fuel Standard (LCFS) no later than 2026. Again, we applaud the administration for this proposal. We encourage the Commonwealth to include more detail about this plan in its final draft of the 2030 CECP: How would the LCFS interact with TCI-P?

### **Strategy T3: Reduce Upfront ZEV Purchase Cost Burden**

**1. Commit to implementing point-of-sale rebates and a low and moderate income (LMI) consumer program in 2021.**

We applaud the Commonwealth's ambition to increase the number of EVs in Massachusetts to 750,000 to 1,000,000 by 2030 and agree that reducing the upfront cost burden is a critical lever for accelerating EV adoption. However, we feel that the listed "Strategy Actions" in Strategy T3 should be more certain and immediate. Specifically, the "Strategy Actions" direct the Department of Energy Resources (DOER) to "explore" a point-of-sale program and EEA and the Massachusetts Clean Energy Center (MassCEC) to "investigate" a LMI program. Those are ideas worthy of implementation in 2021, and we urge the Commonwealth to commit to doing so.

Over the past couple of years, EV adoption (as measured by the percentage of Massachusetts car sales that are electric) has increased by about 1% each year; to reach the goal of the 2030 CECP, which is equivalent to 50% of new car sales being electric in 2030, we need to increase sales by about 4% each year. We cannot achieve that level of growth without making EVs more accessible to more people; making the MOR-EV rebate point-of-sale and offering a LMI program would begin to do just that.

We took the liberty of attempting to depict what the market penetration would have to be in this decade<sup>2</sup>. Even with the recognition that technology adoption generally does not happen linearly, Figure 1 (below) tells us that the sooner we get the big new programs described in the 2030 CECP, the better. Otherwise, the slope of the curve gets too steep.

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<sup>2</sup> Data from EVAdoption.com. <https://evadoption.com/ev-market-share/ev-market-share-state/>

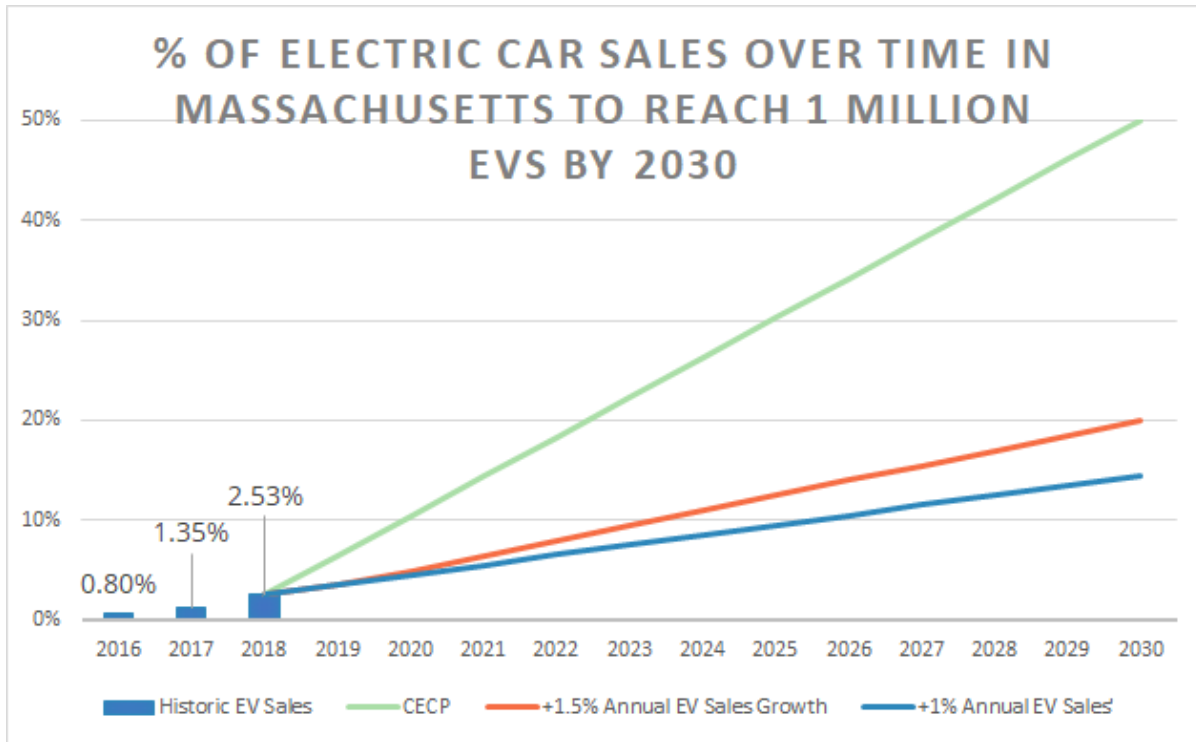


Figure 1 - Percentage of EV car sales under several EV adoption scenarios. The CECP recommends that at least 50% of all new cars in Massachusetts must be electric by 2030.

**2. Rebates are important, but don't forget there are other tools in the toolbox.**

Purchase rebates are a critical tool to accelerating EV adoption at this time because the upfront costs of EVs make switching to an electric car cost-prohibitive for many people. Lithium-ion battery costs, which make up the bulk of the cost differential between EVs and gas-powered cars, are falling quickly, and analysts expect EVs to reach cost-parity with gas-powered cars sometime in this decade<sup>3</sup>. Our interpretation of the 2030 CECP is that the adoption of California's Advanced Clean Cars II standard, with funding support from TCI-P, will complement these market-based cost reductions to the point where EV adoption rapidly accelerates.

The Transportation Sector Report of the 2050 Roadmap indicates that it may take rebates up to \$8,000 per vehicle to accelerate EV adoption to the point of one million cars by 2030.<sup>4</sup> We believe that \$8,000 is too high for several reasons:

- Our observations of how fast EVs have improved in recent years on cost, range, and other key factors. We expect the pace of improvement to accelerate in the next few years.

<sup>3</sup> "Batteries for Electric Cars Speed Towards a Tipping Point." Bloomberg New Energy Finance, December 2020.

<sup>4</sup> Available at: <https://www.mass.gov/doc/transportation-sector-technical-report/download>

- Optimism that the federal government will support EV adoption through several policies. The impact of these potential policies is difficult to quantify, but announcements made by the Biden administration in recent weeks have clearly changed the game from what it was when the 2030 CECP was written.
- A 2019 study by Synapse Energy Economics<sup>5</sup> for New York State, which found that a rebate of \$5,000 per car would be sufficient to increase adoption in NYS to a point that is comparable to the goals in the 2030 CECP. Our view that the 2030 CECP and 2050 Roadmap both lean too heavily on rebates and not enough on utility ratemaking that could both incentivize car buyers and grid integration by offering significant incentives for charging off-peak. We discuss this point further in our comments on Strategy T4.

## **Strategy T6: Stabilize Light-Duty VMT & Promote Alternative Transportation Modes**

### ***1. Establish a more ambitious goal for VMT reduction.***

Although we appreciate the 2030 CECP's focus on electrification, the state should be willing to use all the tools available to reduce greenhouse gases, and investing in transit to reduce vehicle-miles-traveled (VMT), rather than settling for stabilizing its growth, should be integrated in the 2030 CECP for the following reasons:

- VMT reduction is a safe bet to reduce emissions amid the uncertainty of how electric vehicle technology will develop and how quickly it will decrease in cost.
- Other state goals, including air quality benefits, quality of life, and equity, are advanced by investing in transit, in addition to reducing VMT.
- More ambitious VMT reduction goals make 100% electric vehicle sales by 2035 more reachable by providing alternatives to car ownership.

The 2030 CECP, in its lack of enthusiasm for transit and VMT reduction, seems to follow the logic presented by the transportation technical appendix of the 2050 Roadmap. This appendix argues that, as most of Massachusetts' car travel occurs in the Boston-Metro area where a large number of drivers travel short distances and with so many individual actors at play, it is difficult to reduce VMT in a meaningful way. However, this analysis fails to recognize that short trips in dense urban areas are most likely to be replaced with non-vehicle alternatives that reduce VMT.

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<sup>5</sup> ["TRANSFORMING TRANSPORTATION IN NEW YORK; Roadmaps to a Transportation Climate Target for 2035."](#) Synapse Energy Economics, Sept. 2019.



Furthermore, getting 100% EV sales by 2035 (as is recommended in Strategy T2) is made easier by a stronger commitment to VMT reduction. Providing alternatives to car travel (walking, biking, and transit) can end up replacing vehicle ownership altogether. Even a modest reduction in car ownership could make the prospect of 100% all-electric vehicles sales by 2035 easier and less expensive.

As an example, Boston is estimated in the 2050 Roadmap to require 130,000 charging ports to support city-wide electrification. Reduce the need for car ownership in the city, and the infrastructure investment to support electrification is dramatically lower. Likewise, the total expected cost of consumer purchase rebates for EVs will be lower if the state enables more commuters to trade in their gas-powered vehicle for a transit pass.

**2. Explicitly name transit as a priority investment to support VMT reduction, densification, and smart growth.**

Strategy T6 of the 2030 CECP implies that “smart growth” policies will lead to 1% reduction in climate-warming emissions, with the implication that housing stock near transit will reduce emissions by providing an adequate alternative to car ownership. Pursuing smart growth policies is a good strategy, but without a commitment to maintaining or improving transit, transit-oriented development will not lead to substantial VMT reduction. Transit cannot be taken for granted.

- In the last year, transit ridership has taken a nosedive due to COVID-19 and recently announced MBTA service cuts will make matters worse. Many essential workers and low-income workers rely on transit. Cutting service while office workers stay at home is a direct threat to their livelihoods.
- Once transit service is disrupted, it sends a clear message that transit is unreliable. It discourages ridership, and those with the financial means to purchase a vehicle will do so. Until EVs are the norm, most of these vehicles will be gasoline-powered and undermine electrification efforts.
- The lack of fare revenue from the drop in riders justifies further service cuts. If transit service ever returns to normal, riders that switched to driving a personal vehicle now own a vehicle and have no reason to return to transit. Those riders are lost to the public transit system.

The report from the Commission on the Future of Transportation from 2018 directed the Commonwealth to “*prioritize investment in public transit as the foundation for a robust, reliable, clean, and efficient transportation system.*”<sup>6</sup> It goes on to assert that “*only by attracting and retaining new riders can the Commonwealth see the benefits that transit can provide for GHG*

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<sup>6</sup> Available at: <https://www.mass.gov/orgs/commission-on-the-future-of-transportation>

*reduction, congestion relief, economic growth, and community revitalization.” We urge the Commonwealth to follow these directives. Without a strong commitment to transit, smart growth policies will not decrease VMT or reduce climate-warming emissions, nor will they address Boston’s worst-in-the-nation congestion.*

***3. Establish a plan and target date to implement congestion pricing in the Boston Metro Area.***

With a million EVs on the road, gas tax revenue, which is a primary funding source for transit, will take a big hit by 2030. TCI-P will only be around through 2032, which means the Commonwealth needs to develop a plan to make up for the lost revenue without putting EVs at a disadvantage to gas-powered cars or cutting the transit budget. Major cities around the world are increasing tolls on cars entering the city during peak traffic times and using the toll revenue for public transit. Congestion pricing is a smart, fair strategy that aligns with the goals of the 2030 CECP.

Congestion pricing would reduce car traffic and congestion in the Boston Metro Area, provide a consistent source of funding for commuter rail, bus, and subway service, and improve quality of life in the city. Based on an analysis of expected revenue loss from the gas tax and EV uptake, the state should establish a plan and target date to implement congestion pricing in the urban core of the Boston Metro Area.

## **Strategy T2: Coordinated Advanced Clean Vehicle Emissions and Sales Standards**

***1. Advanced regulations starting in 2026 need to be balanced with more concrete action in the next five years.***

The Strategy Action to adopt California’s Advanced Clean Cars, Advanced Clean Trucks, and Advanced Clean Fleet rules is excellent. We’re thrilled by Massachusetts’ willingness to follow California by banning the sale of new internal-combustion engine (ICE) vehicles by 2035 and hope that Massachusetts’ leadership inspires other states to do the same.

However, some of these regulations (including the ICE ban) are still being written in California and won’t take effect until 2026. Although the advanced regulations will ensure that automakers deliver an adequate supply of EVs to the Commonwealth, the impact of the policies will be backloaded to the latter half of the decade. This is a high-stakes gamble.

To avoid putting more pressure on the last couple years of the decade to overperform, we urge the state to focus on actions it can take in the next five years to account for the delayed effects of adopting California’s regulations.

**2. Segment and prioritize within the medium- and heavy-duty space. 100% of school bus and transit bus procurements should be electric by 2030.**

Though the market for medium- and heavy-duty electric vehicles is nascent, the state has already signed onto a regional agreement with the goal of making 30% of medium and heavy-duty vehicle sales electric by the end of the decade. We applaud the state for its commitment and look forward to seeing more details on this. We also suggest that *starting with* electrifying school buses and transit buses is a good first step for several reasons.

- As a matter of equity, investments to electrify buses would deliver the air quality benefits of electrification to children and transit bus riders, who are more likely to be low-income, people of color, and/or overburdened by air pollution.
- Electric buses are proven to have lower lifetime cost of ownership compared to their diesel counterparts. Transit agencies and school bus operators, however, are often cash-strapped and lack the capital to afford the higher upfront cost. State support can help overcome this barrier and help public-serving entities realize cost savings of electrification.
- School bus schedules include a lot of downtime, which will be forgiving as drivers and fleet operators get the hang of charging.
- Electric school buses and transit buses are market ready. That is, they can be procured now and be on the roads in the near-term. This road-readiness is significant because it will allow us to make tangible progress in the first half of the decade, while model availability for other medium- and heavy-duty vehicles continues to develop.
- With a good number of diesel-guzzling school and transit buses on the road, starting here can help develop a path forward for long haul trucks, urban delivery vans, and other high-duty vehicles. Investing in electric school and transit buses will lead to market transformation, rather than a few one-off demonstration projects.
- Since transit agencies are quasi-government organizations, the decision to electrify can be planned in conjunction with the state. Switching a large fleet over to electric vehicles will require long-term planning for charging infrastructure. So far, the MBTA has dragged its feet on bus electrification by arguing about the extent to which the soon-to-be renovated Quincy bus depot should be prepared for all-electric buses. With more support from the state on this issue, the MBTA and other regional transit agencies can make sure its infrastructure plans align with the state's electrification goals.

100% of transit and school bus purchases should be electric by 2030. Our estimates show that electrifying the current MBTA and school bus fleets would cut 167,000 MT CO<sub>2e</sub> annually. The complete electrification of all the Massachusetts Regional Transit Authority (RTA) fleets,

including the Pioneer Valley Transit Authority, Worcester Regional Transit Authority, and others, would cut emissions by another 55,000 MT CO<sub>2</sub>e per year in the Commonwealth<sup>7</sup>.

*Figure 2 – Massachusetts transit and school bus fleet inventory and estimated annual greenhouse gas reduction associated with electrification.*

<b>Fleet</b>	<b>Number of Vehicles</b>	<b>Annual GHG Reduction (MT CO<sub>2</sub>e)</b>
MBTA diesel	500	33,750
MBTA diesel hybrid	285	14,108
MBTA CNG	175	8,570
Diesel school	9,000	110,190
RTA diesel & diesel-hybrid	1,600	55,000

**3. Appoint an “Electric Bus Czar” responsible for coordinating across state offices to deploy electric school and transit buses.**

Altogether, the full conversion of all public transit and school bus fleets would amount to roughly 222,000 metric tons CO<sub>2</sub>e, or 12% of the state’s 2030 cuts from medium-and-heavy-duty vehicles, a good start to achieve the 2030 limit. The state should appoint an “Electric Bus Czar” who would be responsible for facilitating the procurement of electric school buses and regional transit authority buses, as well as planning for charging infrastructure. Since 100% electrification of all transit and school buses would require coordination across many stakeholders (including bus charter companies, RTAs, electric bus manufacturers, charging network companies, school districts, and utility companies, to name a few), having a designated leader within the state to focus on the big picture of procurement is essential.

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<sup>7</sup> [“The road to net-zero is paved by electric buses.”](#) Green Energy Consumers Alliance, 2020.

The position would also allow a centralization of knowledge and experience to ensure that best practices from the electrification of one school district fleet or transit fleet would carry over to the others.

## **Strategy T4: Deploy Electric Vehicle Supply Equipment & Enable Smart Charging**

### ***1. Commit to directing electric utilities to implement residential charging incentive programs and time-varying rate structures that account for all the benefits of smart-charging EVs.***

The “Strategy Actions” in T4 direct EEA and DOER to “explore a utility-based residential charging incentive program” and “explore and support Time-Varying Rates (TVR) and Active Demand Response (ADR) programs”. Exploration and investigation, however, will not result in smart-charging unless *programs are implemented that benefit consumers*. And without programs that benefit consumers, these efforts will not result in higher EV adoption. Therefore, we recommend that the Commonwealth change these “Strategy Actions” to *committing to implement* residential charging incentive programs and time-varying rate structures. Those time-varying rate structures should account for *all* of the benefits of charging an electric vehicle off-peak: not just generation/supply benefits, but distribution, transmission, and greenhouse gas benefits, too. Accounting for the full benefits of charging off-peak will result in much higher cost-savings for consumers and do a better job of shifting demand, all through a durable and self-sustaining funding mechanism.

Specifically, we propose that the DPU mandate utilities to:

- Offer a large discount for off-peak charging that will both prompt behavior change and serve as an incentive for EV purchases. The amount of the off-peak charging discount should exceed the 3-5 cent savings on wholesale electricity costs associated with shifting charging to off-peak hours, specifically by including transmission, distribution, and greenhouse gas benefits.
- Include an up-front rebate of up to \$1,000 for the installation of a smart Level II charger tied to participation in the off-peak charging program or managed charging program. That would take some pressure off MOR-EV and provide an incentive to join an off-peak charging program. Properly calibrated, it would not be a subsidy to EV drivers paid for on the backs of those without EVs.<sup>8</sup>

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<sup>8</sup> [“Good things happen when you smart charge your electric car.”](#) Green Energy Consumers Alliance, 2019.

- Standardize NIST Handbook 44 Codes for smart Level II charging stations so they can collect utility-grade metering data to implement time-varying rates on EV charging without requiring the installation of a second meter.
- Offer time-of-use rates without placing an upfront cost burden on participants. Since off-peak charging saves money for consumers and the entire system, EV drivers should be able to easily switch rates without paying to upgrade their own meter or pay a high customer fee.
- Make the benefits and cost savings of off-peak charging clear and easy-to-understand. For example, offer “ghost billing” to explain how electricity bills under a new time-varying rate would change. Consumer acceptance of time-varying rates and managed EV charging is critical to reducing EV fuel costs and supporting EV adoption.
- Design rate options and programs that ensure maximum consumer participation. That means offering both time-varying rates and managed charging programs. Consumers should have flexibility to select an EV charging utility program that works best for them without being inundated with too many options, too much confusion, or too many hurdles in the registration process.

**2. *Move swiftly to develop rate structures that facilitate and accelerate the build-out of public charging infrastructure.***

The 2030 CECP rightly identifies rate structures – particularly demand charges – as an impediment to the build-out of a robust public charging infrastructure network. We are glad to see “Strategy Actions” directing EEA, DOER, and MassCEC to work on this important issue, particularly with an eye towards DC Fast Charging. However, the lack of a listed timeline for these actions is worrisome; we cannot afford to wait until the latter half of the decade to address rate design for public charging. For the final draft of the 2030 CECP, we recommend that these “Strategy Actions” specify that this exploration and analysis take place in 2021 and that changes to rate structures get implemented by 2022, so that these changes can contribute to EV adoption in this decade.

## **Strategy T5: Engage Consumers & Facilitate Markets**

**1. *Yes, more work to raise consumer awareness is sorely needed.***

We appreciate the attention paid to consumer education in the 2030 CECP, as well as the mention of Green Energy Consumers’ Drive Green<sup>9</sup> program. From our experience running this program and interacting with both EV drivers and car dealerships, we are very familiar with the main barriers to EV adoption, such as the upfront costs and the lack of a robust charging network, and are glad to see the 2030 CECP take these challenges head-on. However, our interaction with consumers has demonstrated a huge – and continuing – need

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<sup>9</sup> Available at: <https://www.greenenergyconsumers.org/drivegreen>

for programs like ours that fill the education and awareness gap left by car dealers and manufacturers, neither of whom is preparing today's consumers well to make the switch to EVs. We are prepared to meet that need at Green Energy Consumers. Also, group-buy programs like Drive Green, which make EVs more accessible through dealer discounts, reduce costs in a way that leverages MOR-EV funding well.

In addition to formal educational programming, there are other, less obvious policies that increase awareness of EVs, such as allowing EV access to HOV lanes, offering EV-specific license plates, designated parking spaces for EVs, and leading by example. The Commonwealth would do well to consider these strategies as well as related measures such as adopting "pay by the mile" auto insurance and the placement of warning labels on gas pumps.

## **Buildings**

According to the Plan, over a third of the GHG reductions in the whole plan would come from the buildings sector. And the lion's share of that reduction will be enabled by the establishment of a Heating Fuel Emissions Cap. As such, the final draft of the CECP should lay out a clear path towards timely development and implementation of the cap. The current draft does not provide sufficient detail or commitment on the cap or on the high-performance building code, another key aspect of reducing emissions by 2030.

### **Strategy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions**

***1. The declining cap on heating fuel emissions is essential. Let's get started as soon as possible.***

We commend the administration for proposing a long-term, declining cap on heating fuel emissions. We deem it as essential. Without such a rigorous system for limiting emissions and funding investment in this sector, we will not be able to shift homes and businesses quickly enough away from fossil fuels. We see this cap as the necessary foundation to support related policies such as building codes, Mass Save programs, and thermal electrification.

Based upon the Plan's description of the cap, we are enthusiastic in general, but have a lot of questions. We support the establishment of a Commission on Clean Heat to take on the difficult and complex task of fleshing out the cap, and we would appreciate the opportunity to serve on this Commission. As you may know, Green Energy Consumers has worked with heating fuel consumers, mostly residential, since 1982 and still operates what might be the largest heating oil buyers-group in the country. Over the years, we have gained expertise in other areas of building heat through our advocacy on Mass Save and by conducting two heat pump buyers-group pilots.

Our main concern today about the cap, however, has to do with timing. Strategy B3 indicates that the Commission on Clean Heat will complete its work by the end of this year and have the cap in place by 2023. Despite the large task before the group, it is critical to meet that schedule in order to put this system in place and begin funding investment in thermal electrification and other energy efficiency measures.

## Strategy B2: Pivot the Market for Building Envelope Retrofits and Clean Heating Systems

### 1. Increase the planned rate of heat-pump adoption for 2022-2024.

Regarding electrification, we acknowledge the Plan’s goals to install heat pumps in a million homes and in 300-400 million square feet of commercial real estate. We took the liberty of graphing a possible trajectory for heat pump adoption at that scale. Mass Save’s current Three Year-Plan for 2019-2021 has a target of installing about 15,000 heat pumps per year. If the Three Plan for 2022-2024 *doubled* the rate to 30,000 per year, the trajectory will have to be quite steep after 2024 to reach one million installations by 2030.

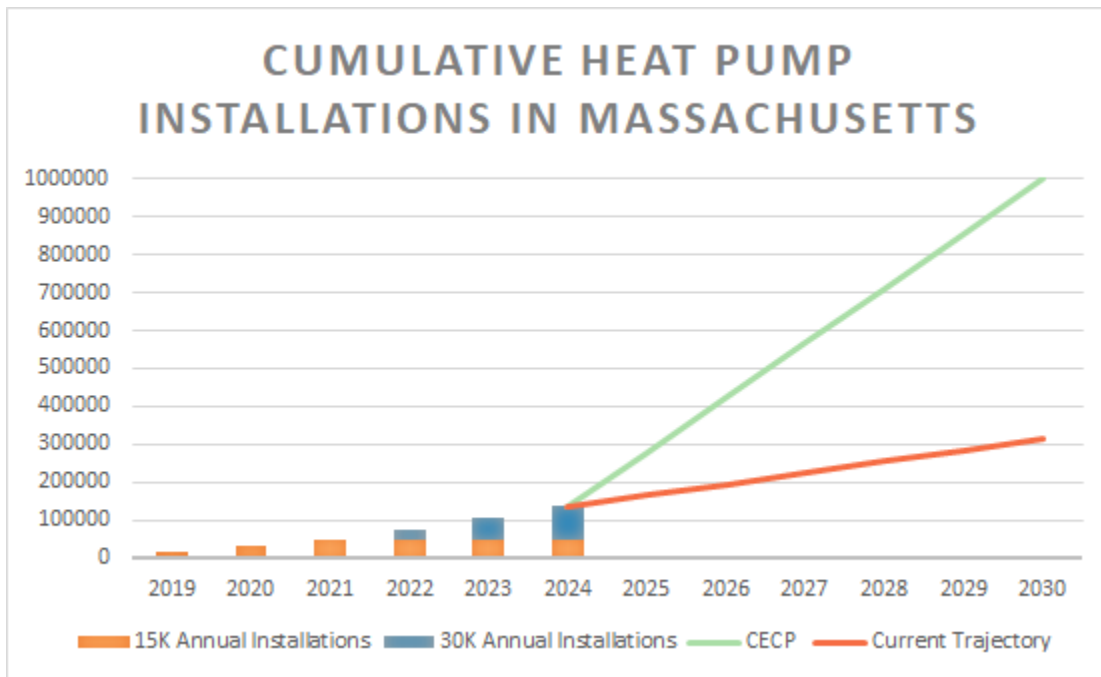


Figure 3 – Trajectory for cumulative heat pump installations in Massachusetts. Even if Mass Save heat pump installations double in 2022, Massachusetts will not reach the goal established by the CECP.

From this graph, we can see that the first order of business for the administration will be to require Mass Save program administrators and municipal utilities to dramatically increase their capacity to install heat pumps in the 2022-2024 time period. This rate of heat pump



installation will be especially challenging given the current program's consistent and concerning shortfalls on promoting heat pumps.

***2. Stop funding Mass Save's heat pump incentives through the energy efficiency surcharge on electricity bills after 2022-2024.***

We believe that it would be unwise to continue Mass Save's current practice of financing heat pump incentives through very significant energy efficiency surcharges on electricity bills beyond 2024. If we continue to rely on the current method, we will be making the electrification of buildings and transportation economically far more difficult. Already, electricity rates in Massachusetts are a factor working against heat pump market penetration. This is why we conclude that the Heating Fuel Emissions Cap is so critical.

***3. Support equitable investments in energy efficiency.***

We commend the CECP for specifying that Massachusetts must ensure equitable access to energy efficiency. Energy efficiency and clean heating are especially important when it comes to Environmental Justice communities. Although low-income energy consumers, renters, non-English speakers, and other vulnerable communities stand the most to gain from the economic, health, and environmental benefits of the efficiency programs, they have often been left out of the programs historically. We urge the CECP to commit to the recommendations of the Implementation Advisory Committee's Climate Justice Working Group. These recommendations include specific outlines to which the CECP should commit that would center equity and justice in this plan, especially in the building sector.

## **Strategy B1: Avoid Lock-In of Building Systems That Are Not 2050-Compliant**

***1. Adopt a Net Zero Energy Code early in the decade.***

The CECP commits to a "high-performance stretch energy code" that will be available as optional starting in 2023 and mandatory beginning in 2028. Although the high-performance stretch energy code is described as having a "focus on deep efficiency and electrification" and as requiring "passive-house level building envelope efficiency," the CECP does not provide further detail. The 2050 Decarbonization Roadmap report modeled the importance of rapid adoption of a Net Zero code in avoiding emissions from new construction.

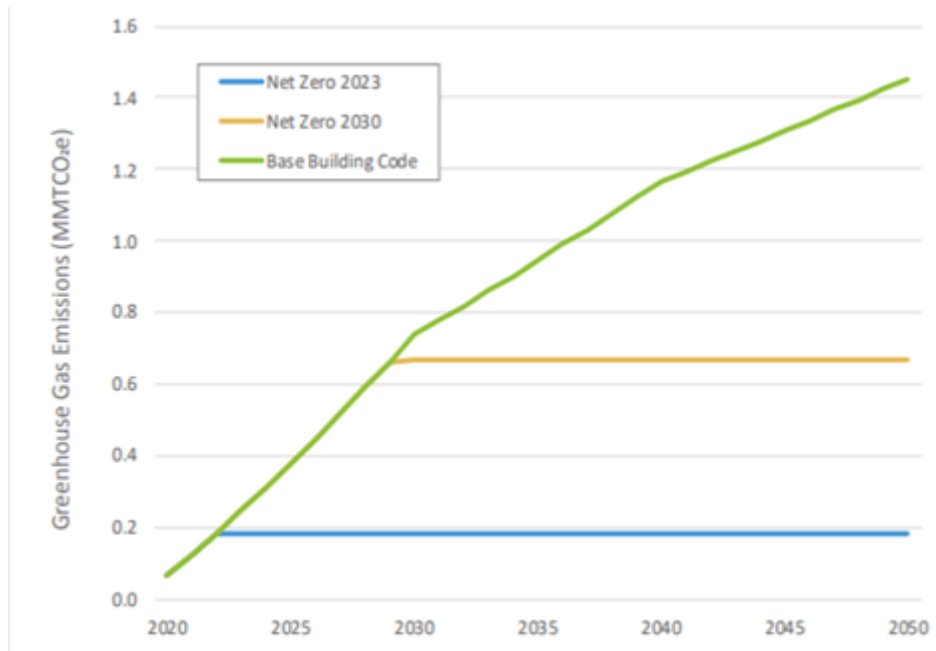


Figure 4 – Emissions from new buildings with and without a Net Zero code.

It is clear that adoption of a high performance stretch energy code early in the decade—and the statewide requirement of this code sooner than 2028—will make it much easier to meet our challenging building sector targets.

**2. Continue to update state appliance efficiency standards as efficiency technology improves.**

Green Energy Consumers commends the General Court and the administration for supporting appliance efficiency standards during the 2019 - 2020 legislative session and again in S9. We sincerely hope that the final climate bill enacts the long-awaited updates to appliance standards. Over the next decade, efficiency technology will continue to improve, which means that appliance standards will again become outdated. The CECP should acknowledge that existing appliance standards should be updated as often as necessary to reflect the best standards nationally every two years.

## **Energy Supply**

Even though Massachusetts has made great progress in the electricity sector, there are opportunities to make the grid even cleaner. According to the Plan, 21% of the emission reductions this decade would come from cleaning up the state's electricity resources. Since the 2030 CECP's approach to emissions reductions in the transportation and buildings sector largely relies on electrifying transportation and heating, progress in the electricity sector underpins the whole plan. The faster we decarbonize the grid, the more we will benefit from the installation of every new heat pump and electric vehicle.

### **Strategy E3: Align attribute markets with GWSA compliance**

#### ***1. Raise the Clean Energy Standard to at least 60% by 2023 and 100% by 2030.***

More than half of the power sector emission reductions in the plan come from adjusting the Clean Energy Standard (CES) to "at least 60%" by 2030. We strongly support increasing the CES to at least 60% because, without it, already-planned clean energy procurements will flood the REC market and render the CES and Renewable Energy Portfolio Standard (RPS) ineffective. In 2023 or 2024, Massachusetts will begin receiving about 20% of its power from Hydro Quebec. Shortly thereafter, we will have 1,600 megawatts of offshore wind power coming from the Vineyard Wind and Mayflower Wind projects.

On top of that, we will have increasing amounts of solar power all the way through 2030. These additions will add up to more clean power than needed to meet the current CES in 2030. If the standard is not adjusted upwards, Massachusetts would have to sell off a lot of that clean power to other states and forfeit the right to those associated emission reductions. For that reason, we strongly support raising the CES to at least 60% by 2023, when the hydro power is expected to come online, and to 100% by 2030.

We're optimists that there are many ways to reduce emissions in ways that are inherently fair or that can be made to fair to everyone. Increasing the CES is inherently fair insofar as everyone pays into it, everyone benefits, and low-income people can qualify for electricity rate discounts. Offshore wind prices<sup>10</sup> are proving to be affordable, and with the right workforce development efforts in place, we can ensure that everyone is given a fair shot at the good-paying jobs that will be created in the growing offshore wind and solar industries.

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<sup>10</sup> ["Renewable energy is affordable – look at these offshore wind prices."](#) Green Energy Consumers Alliance, 2020.

Rhode Island<sup>11</sup> appears to be headed towards adopting policies to reach 100% renewable electricity by 2030. Other states are moving towards that goal and President Biden wants the nation to be there by 2035. Given the offshore wind resource we have in the Bay State, along with solar and Canadian hydro coming online in 2023, Massachusetts should set the CES to 100% by 2030 in the 2030 CECP. It would be one of the easiest policies to implement in the plan and could make up for potential shortfalls from other strategies described in the plan. Since the 2030 CECP's plan for emissions reductions in the transportation and buildings sector largely rely on electrifying transportation and heating, greater progress in the electricity sector maximizes the impact of each electric vehicle and heat pump installed by 2030.

The 2030 CECP may have to be revised in order to accommodate certain aspects of An Act to Create a Next Generation Roadmap for Climate Policy. In particular, the new law would require the administration to set an emissions limit in five-year increments, starting with 2025. Accelerating the CES increase to a date before 2025 would help greatly to meet any limit proposed for 2025. The climate bill also increases the Renewable Portfolio Standard by 5% between 2025 and 2030. That would contribute to Massachusetts' ability to meet a 100% CES by 2030. For all these reasons, a CES much greater than 60% will be necessary. A 100% by 2030 CES is doable and could be the key to ensuring that the state meets the 2030 limit.

***2. Incentivize more communities to adopt Green Municipal Aggregation (GMA) and encourage the DPU to approve GMA proposals in a timely manner.***

We recommend that the Plan be revised to include a set of measures designed to foster the model that we call "Green Municipal Aggregation<sup>12</sup>" (GMA) (aka "Community Choice Aggregation") which a growing number of communities in the Commonwealth have adopted since 2016, when Melrose and Dedham were the first. With GMA, communities choose an electricity supplier that includes in the default product more Class I renewable energy content than required by the RPS. Communities also offer "opt-up" products that allow consumers to receive 100% Class I renewable energy.

We estimate that by the end of 2021, the GMA model will be responsible for increasing voluntary demand (over and above the RPS) for Class I power by roughly 700,000 to 1 million megawatt-hours per year, the equivalent of about 200 large-scale wind turbines. Put another way, GMA increases demand for green power as much as a 2% increase to the RPS. GMA is perhaps the most cost-effective and most equitable carbon reduction measure available through public policy.

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<sup>11</sup> "[Getting to 100% Renewable Energy in Rhode Island.](#)" Green Energy Consumers Alliance, 2020.

<sup>12</sup> Available at: <https://www.greenenergyconsumers.org/aggregation>

Unfortunately, communities that have adopted GMA at the local level have been waiting too long<sup>13</sup> for their plans to be approved by the Department of Public Utilities (DPU) – often on the order of one full year. This delay has slowed down emission reduction efforts and is sending the wrong message to communities that might be contemplating aggregation.

Beyond the initial approval of aggregation plans, the 2030 CECP should also provide financial support to aggregations. A small incentive would leverage the voluntary purchase of even more green power. For example, we suggest that communities with GMA be placed at the head of the line for funding under the Green Communities program<sup>14</sup>.

## **Strategy E6: Incorporate GWSA into Distribution-Level Policy Considerations**

### ***1. Discuss and expand upon the role of energy efficiency and the Three Year Plans as a strategy to reduce emissions in the electric sector.***

Although the CECP recognizes the importance of energy efficiency in reducing emissions from the building sector, it neglects to include energy efficiency in the electric sector. Although much of the low hanging fruit of electric sector efficiency is gone due to the prior success of Massachusetts' energy efficiency programs, energy efficiency remains an important strategy for electricity emissions. The CECP should describe and quantify the role that appliance standards, building codes, energy efficient appliance incentives, and active demand management initiatives can play in reducing electricity emissions.

Green Energy Consumers Alliance supports continued progress on distribution system planning and grid modernization. The CECP begins to outline ways in which grid-focused investments can accelerate emissions reductions in line with the 2030 goal, but it falls short of making specific commitments. The CECP should commit to investing in the grid modernization technology most important for emissions reduction, including grid sensors that will reduce renewable energy curtailment and smart meters or comparable devices that will enable time of use electricity rates.

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<sup>13</sup> [“Municipal aggregation in Massachusetts is being slowed down by state government: Consumers & the environment are paying the price.”](#) Green Energy Consumers Alliance, 2020.

<sup>14</sup> Available at <https://www.mass.gov/green-communities-designation-grant-program>

## **Strategy E2: Develop and Coordinate Regional Planning and Markets**

### ***1. Provide more detail about developing and coordinating regional efforts to clean up the power sector.***

According to the 2030 CECP, a large portion of the emission reductions from the power sector (roughly 30-43%) comes from making changes to the regional power grid in collaboration with the five other New England states. This approach makes a lot of sense, but this part of the plan needs more elaboration. How exactly would regional coordination lead to 1.3 to 2.2 MMTCO<sub>2</sub>e reduction by 2030? What kind of process can advocates expect to see in the coming years?

## **Conclusion**

We thank the Commonwealth for its interim 2030 CECP and appreciate the opportunity to provide feedback. Our view is that every year within this decade is crucial, which is why we have studied the 2030 CECP in such great detail. We look forward to working with various agencies on policy formulation and implementation.

February 9, 2021

Ms. Kathleen Theoharides  
Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

Re: Massachusetts's Clean Energy and Climate Plan for 2030

**COMMENTS OF THE PROPANE GAS ASSOCIATION OF NEW ENGLAND**

On behalf of the Propane Gas Association of New England (PGANE), which represents propane marketers and suppliers across Massachusetts, we appreciate the opportunity to provide comments about the proposed Clean Energy and Climate Plan for 2030 (2030 CECP). Our members provide clean-burning and critical energy to residential, commercial, and agricultural customers across the Bay State. Massachusetts's propane industry generates more than \$615 million in economic activity annually.<sup>1</sup>

PGANE commends the Commonwealth for its desire to promote energy efficiency, reduce greenhouse gas (GHG) emissions, improve air quality, and foster healthier, more vibrant communities. However, we are unable to support the 2030 CECP in its current form. And unless major revisions are undertaken, we will be forced to oppose it. The plan creates an energy pyramid with electricity squarely at the top. State officials overlook how these policy-driven electrification efforts will impact consumers, businesses, and the environment. The narrative that decarbonization is only possible through electrification is false. We also reject the perceived notion that, from an environmental perspective, there is no difference between thermal fuels. Propane has many positive attributes that should be recognized. **Clean propane energy accelerates decarbonization and access to clean propane ensures environmental equity on the path to Net Zero.**

**I. Electrification Strategy**

The 2030 CECP makes it abundantly clear that the Executive Office of Energy and Environmental Affairs (EEA) wants electricity to reign supreme. The plan seeks a massive overhaul of the energy sector and calls for the electrification of space and water heating and the replacement of furnaces and boilers powered by propane and other non-electric energy options.<sup>2</sup> To compel building owners to switch fuels, under Strategy B3, officials would impose a long-term, declining cap on emissions from heating fuels, including propane and natural gas.<sup>3</sup> The report glosses over the fact that our electrical grid is extremely

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<sup>1</sup> [https://npga.org/wp-content/uploads/2020/06/Massachusetts\\_Propane-1-Page\\_2020.pdf](https://npga.org/wp-content/uploads/2020/06/Massachusetts_Propane-1-Page_2020.pdf)

<sup>2</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>3</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

inefficient and energy is lost during each step of the delivery process (i.e., power generation, transmission, distribution). For example, most electricity generated in Massachusetts comes from natural gas.<sup>4</sup> However, the efficiency of a typical natural gas power plant is only 44 percent.<sup>5</sup> And additional energy is lost during the transmission and distribution of that electricity to an outlet for an end-use purpose.<sup>6</sup> These inherent inefficiencies mean more GHGs are released, including the released usage of SF6, the most potent of all greenhouse gases. For context, **the federal government’s Energy Star Program gives propane, which is a primary energy source, a source-site ratio of 1.01, compared to 2.80 for electricity from the grid.**<sup>7</sup> This means it takes 2.80 units of electricity to produce and deliver one unit of energy to a home, compared to only 1.01 for propane. Propane is much more efficient at delivering energy than drawing electricity from the grid.

Heating homes and water in Massachusetts with propane reduces demand for grid electricity. This is notable because during period of prolonged cold weather, when demand for energy is high, ISO New England has, in the past, relied on oil-fired generation for baseload electricity production.<sup>8</sup> Oil-fired generation is especially inefficient;<sup>9</sup> it is also particularly dirty.<sup>10</sup> While electrons must travel from a generation plant to an end-user by way of power lines, propane can be economically transported in multiple ways, including pipeline, rail and over-the-road vehicles.<sup>11</sup> From an energy resilience perspective, the ability to move propane in this fashion is quite beneficial.

The CECP calls for increasing the share of electricity produced from renewable and carbon-friendly sources.<sup>12</sup> While it is difficult to know if these future generation predictions will come to pass, we do know that, today, more than 71 percent of electricity in Massachusetts comes from fossil fuels.<sup>13</sup> And

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<sup>4</sup>

<https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=vvvvu&geo=002000000000g&sec=008&freq=A&start=2018&end=2019&ctype=linechart&ltype=pin&rtype=s&rse=0&mctype=0&pin=>

<sup>5</sup> [https://www.eia.gov/electricity/annual/html/epa\\_08\\_01.html](https://www.eia.gov/electricity/annual/html/epa_08_01.html)

<sup>6</sup> <https://www.eia.gov/tools/faqs/faq.php?id=105&t=3>

<sup>7</sup> <https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf>

<sup>8</sup> [https://www.iso-ne.com/static-assets/documents/2018/01/envtlupdate\\_20180130.pdf](https://www.iso-ne.com/static-assets/documents/2018/01/envtlupdate_20180130.pdf)

<sup>9</sup> [https://www.eia.gov/electricity/annual/html/epa\\_08\\_01.html](https://www.eia.gov/electricity/annual/html/epa_08_01.html)

<sup>10</sup> [https://www.iso-ne.com/static-assets/documents/2018/01/envtlupdate\\_20180130.pdf](https://www.iso-ne.com/static-assets/documents/2018/01/envtlupdate_20180130.pdf)

<sup>11</sup> [https://afdc.energy.gov/fuels/propane\\_production.html](https://afdc.energy.gov/fuels/propane_production.html)

<sup>12</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>13</sup>

<https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=vvvvu&geo=002000000000g&sec=008&freq=A&start=2018&end=2019&ctype=linechart&ltype=pin&rtype=s&rse=0&mctype=0&pin=>



although some officials may consider burning wood and municipal waste a renewable source of electric power generation, combustion is still involved and emissions are still produced.<sup>14</sup>

In 2019, Massachusetts had the highest average residential price for electricity in New England; this rate was 40 percent more than the U.S. average.<sup>15</sup> Households of limited means spend a greater share of their income paying for energy compared to those who are more affluent.<sup>16</sup> As a result, they are especially sensitive to any policy that could increase this already heavy energy burden. And widespread electrification, which this proposal would advance, will impact the variability and shape of the electric load.<sup>17</sup> As such, utilities must dedicate more time and effort to address these challenges. This could impact electric rates. The EEA alludes to this very point when it discusses the negative financial ramifications that could occur if “smart charging behavior” for electric vehicle (EV) charging is not adopted.<sup>18</sup>

Commonwealth officials are very clear that educating consumers about the benefits of heat pumps and incentivizing their adoption will be core tenants of their thermal electrification strategy.<sup>19</sup> They contend that heat pumps can provide “efficient heating in cold climates even at outdoor temperatures as low as -15 degrees Fahrenheit.”<sup>20</sup> First, temperatures in Massachusetts can and have fallen below -15 degrees.<sup>21</sup> Second, the performance of air-source heat pumps degrade in cold weather and they begin to lose efficiency around 32 degrees and,<sup>22</sup> in most cold climates, will require a supplemental or backup heating system.<sup>23</sup> The CECP does not adequately address the concerns of relying on heat pumps to provide primary space heating in New England. Nor does it properly discuss the secondary heating sources that many homes and businesses will need to cope with the coldest days of winter. **If heat pumps truly operate as well as stated, then consumers will adopt them on their own accord without incentives, and without artificial restrictions on other space conditioning equipment.**

## II. Mischaracterization of Propane

EEA does a disservice to the energy-consuming public but giving the impression that, from an environmental standpoint, there is no discernable difference between traditional energy sources. This is

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<sup>14</sup> <https://www.eia.gov/energyexplained/biomass/biomass-and-the-environment.php>

<sup>15</sup> [https://www.eia.gov/electricity/annual/html/epa\\_02\\_10.html](https://www.eia.gov/electricity/annual/html/epa_02_10.html)

<sup>16</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4819257/>

<sup>17</sup> <https://www.nrel.gov/docs/fy17osti/68214.pdf>

<sup>18</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>19</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>20</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>21</sup> <https://boston.cbslocal.com/2018/01/07/coldest-temperatures-massachusetts-zero-january-7/>

<sup>22</sup> <https://www.eia.gov/tools/glossary/index.php?id=H>

<sup>23</sup> <https://info.ornl.gov/sites/publications/Files/Pub73753.pdf>

a simplistic view that fails to appreciate propane's positive environmental characteristics. For example, the report states that both fuel oil and propane are "high-emitting petroleum-based heating fuels."<sup>24</sup> Propane and fuel oil are very different. Fuel oil (#2 distillate) produces 161.3 pounds of carbon dioxide (CO<sub>2</sub>) per million British thermal units (Btu) of energy.<sup>25</sup> This is significantly more than propane, which has a low-carbon content.<sup>26</sup> While fuel oil is derived from crude oil, propane is overwhelmingly produced as a by-product of our domestic natural gas processing sector.<sup>27</sup> **Propane is nontoxic and vaporizes the moment it is released from a pressurized cylinder. As such, it presents no threat to soil, surface water or ground water.**<sup>28</sup> These positive attributes stand in stark contrast to fuel oil. For these reasons and more, **propane is designated an approved clean, alternative fuel under the Clean Air Act Amendments of 1990 and the National Energy Policy Act of 1992.** In fact, financial incentives exist in Massachusetts to entice consumers to use propane in lieu of dirtier fuels.<sup>29</sup> We can reduce emissions and protect our land and water resources today, by encouraging the 657,000 households who currently use petroleum products, such as fuel oil and kerosene, for space heating purposes to choose propane.<sup>30</sup>

Using propane furthers the fundamental environmental goal to Reduce, Reuse, and Recycle<sup>31</sup> as promoted by EPA. Most people do not realize that propane is a beneficial byproduct of natural gas processing. Approximately five percent of natural gas processing produces propane. Indeed, a global surplus of propane exists and is projected to continue for the next decade.<sup>32</sup> If propane is not captured and beneficially used to offset another energy source, it is simply burned off. Thus, **propane should be promoted as key component of Massachusetts climate policy**, since reuse of this underutilized byproduct is essentially carbon neutral (surplus byproduct is wasted energy).

#### A. Fluorinated Gases: HFCs

To curtail non-energy GHG emissions, the Department of Environmental Protection (DEP) rightfully understands the need to reduce the use of hydrofluorocarbons (HFCs) in a broad range of applications,

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<sup>24</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>25</sup> <https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>

<sup>26</sup> <https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>

<sup>27</sup> [https://npga.org/wp-content/uploads/2020/12/Supply-Chain-Graphic-June-2020\\_PDF.pdf](https://npga.org/wp-content/uploads/2020/12/Supply-Chain-Graphic-June-2020_PDF.pdf)

<sup>28</sup> [https://afdc.energy.gov/fuels/propane\\_basics.html](https://afdc.energy.gov/fuels/propane_basics.html)

<sup>29</sup> <https://afdc.energy.gov/laws/all?state=MA>

<sup>30</sup>

<https://data.census.gov/cedsci/table?q=heating%20fuels&g=0400000US25&tid=ACSDT1Y2018.B25040&hidePreview=true>

<sup>31</sup> <https://www.epa.gov/recycle>

<sup>32</sup> <https://www.wlpga.org/wp-content/uploads/2019/07/Sustainable-Development-Goals-Contributions-of-LPG.pdf>

including refrigeration and air conditioning.<sup>33</sup> HFCs are extremely potent GHGs with global warming potentials (GWP) thousands of times greater than CO<sub>2</sub>.<sup>34</sup> Since the use and leakage of HFCs is the fastest growing source of GHG emissions in Massachusetts, we support efforts to limit their use in favor of climate-friendly alternatives.<sup>35</sup> **One such alternative is R-290, or refrigerant grade propane.** R-290 has excellent thermodynamic properties and **is an acceptable substitute under the Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) program**, which identifies substitutes for ozone-depleting substances.<sup>36</sup> R-290 has an ozone depletion potential (ODP) of zero and a GWP of only three.<sup>37</sup>

Another promising application for refrigerant grade propane is air conditioning. Researchers at Oak Ridge National Lab have designed an R-290 window air conditioning unit that is 17 percent more efficient than the best performing Energy Star units. These window units can lower energy costs, increase efficiency and reduce GHG pollution by 700 percent compared to units utilizing standard refrigerants.<sup>38</sup>

Again, by simply lumping all traditional fuels into the same group, you fail to recognize propane's unique features and overlook its ability to help reduce emissions – as proposed in Strategy N1 – and safeguard the environment.

### III. Transportation Emissions

In Massachusetts, the transportation sector is the largest source of GHG emissions.<sup>39</sup> Given this, we agree that lowering the carbon intensity of transportation fuel must be a priority. Propane, as a low-carbon vehicle fuel, can again help here.<sup>40</sup> As the Greenhouse Gases, Regulated Emissions, and Energy use in Technologies (GREET) Model from Argonne National Laboratory demonstrates, we can reduce GHG emissions by replacing gasoline-powered passenger vehicles (e.g., cars, trucks), commercial vehicles (e.g., vans, trucks), and buses with propane autogas.<sup>41</sup>

In addition, numerous companies have produced propane engines that can meet the California Air Resource Board's (CARB) optional ultra-low NO<sub>x</sub> (nitrogen oxides) emission certification for heavy-duty

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<sup>33</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>34</sup> <https://www.epa.gov/ozone-layer-protection/recent-international-developments-under-montreal-protocol>

<sup>35</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>36</sup> <https://www.epa.gov/snap/substitutes-household-refrigerators-and-freezers>

<sup>37</sup> <https://www.epa.gov/snap/substitutes-household-refrigerators-and-freezers>

<sup>38</sup> <https://www.ornl.gov/news/refrigerants-cooling-propane>

<sup>39</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>40</sup> [https://www.eia.gov/environment/emissions/co2\\_vol\\_mass.php](https://www.eia.gov/environment/emissions/co2_vol_mass.php)

<sup>41</sup> <https://afleet-web.es.anl.gov/afleet/>

engines.<sup>42</sup> These engines are certified to a NOx emission standard of 0.02 grams per brake horsepower-hour and are 90 percent cleaner than current EPA standards. Fleets around the country, including **school districts, are using these ultra-low NOx propane engines to achieve even greater emission reductions.**<sup>43</sup>

Massachusetts is home to 367 propane autogas school buses.<sup>44</sup> School districts choose propane buses because they operate reliably in the state's cold climate; but also, because they reduce emissions,<sup>45</sup> create a more comfortable cabin experience, and save money.<sup>46</sup>

Simply put, autogas vehicles improve air quality, foster healthier communities and promote the public welfare. And importantly, they can help the Commonwealth reach its clean energy and environmental justice goals in a cost-effective manner. It would be shortsighted to focus only on EVs when propane has so much to offer in the transportation realm.

#### **A. Renewable Propane**

Renewable propane is a by-product of renewable diesel production, and can be derived from biomass, animal fats and vegetable oils.<sup>47</sup> It has the same molecular structure as traditional propane and can safely be used in vehicle engines, including those certified to CARB's ultra-low NOx standard.<sup>48</sup> CARB also recognizes that, when propane is derived from renewable sources, its carbon intensity score decreases even further.<sup>49</sup> **Renewable propane is also an approved pathway for compliance under the federal Renewable Fuel Standard (RFS),** which was created to reduce GHG emissions.<sup>50</sup>

#### **IV. Energy Efficiency**

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[https://ww2.arb.ca.gov/sites/default/files/classic//msprog/onroad/optionnox/optional\\_low\\_nox\\_certified\\_hd\\_engines.pdf](https://ww2.arb.ca.gov/sites/default/files/classic//msprog/onroad/optionnox/optional_low_nox_certified_hd_engines.pdf)

<sup>43</sup> <https://www.roushcleantech.com/portfolio/leander-independent-school-district-2/>

<sup>44</sup> <https://propane.com/for-my-business/school-transportation/schools-that-use-propane/>

<sup>45</sup> <https://cdn.propane.com/wp-content/uploads/2019/07/WVU-School-Bus-Emissions-Final-Report-June-2019.pdf>

<sup>46</sup> <https://afdc.energy.gov/case/3075>

<sup>47</sup> [https://afdc.energy.gov/fuels/propane\\_production.html](https://afdc.energy.gov/fuels/propane_production.html)

<sup>48</sup> <https://www.roushcleantech.com/roush-cleantech-launches-first-available-near-zero-emissions-engines-fueled-by-renewable-propane/>

<sup>49</sup>

[https://ww2.arb.ca.gov/sites/default/files/classic//fuels/lcfs/fuelpathways/comments/tier2/rpane\\_temp.pdf?\\_ga=2.217831764.355390530.1610306946-1390821278.1600954367](https://ww2.arb.ca.gov/sites/default/files/classic//fuels/lcfs/fuelpathways/comments/tier2/rpane_temp.pdf?_ga=2.217831764.355390530.1610306946-1390821278.1600954367)

<sup>50</sup> <https://www.epa.gov/renewable-fuel-standard-program/approved-pathways-renewable-fuel>

The 2030 CECP seeks to improve the thermal envelope of new and existing buildings by, for example, upgrading windows and insulation.<sup>51</sup> These types of efficiency efforts are quite harmonious with residential and commercial buildings that use propane for energy-intensive applications, such as space and water heating.

The propane industry prides itself on offering a variety of energy efficient products. For space heating, consumers can choose between hundreds of residential and commercial boilers<sup>52</sup> and thousands of furnaces that have an Annual Fuel Utilization Efficiency (AFUE) score of 95 or higher (i.e., 95 percent efficiency rating).<sup>53</sup> To efficiently heat water, propane-powered tankless water heaters provide hot water only when needed. These water heaters are incredibly efficient because they do not experience the standby energy losses associated with traditional storage (tank) units.<sup>54</sup> It is also important to note that although EEA's energy plan clearly favors all-electric buildings, mixed-fuel homes (e.g., propane for water heating, cooking) can achieve zero net energy status (i.e., annual energy consumption is net zero), while offering consumers access to the products and amenities they enjoy.<sup>55</sup>

## V. Environmental Justice

Affordable propane systems provide clean energy solutions for Massachusetts families unable to afford high-cost systems. Today, more than ever before, we must be cautious as we draft a plan to improve the health of Massachusetts families, not only to ensure environmental equity in areas of disparity within Massachusetts, but also to prevent environmental detriment to the health of families in other parts of the globe. The atmosphere knows no boundaries, so the reduction of emissions in Massachusetts should not increase emissions in other parts of our planet. Promoting battery technology through the promotion of electricity is currently inflicting environmental harm to a much more egregious extent amongst the poorest and most disadvantaged communities. Locations such as the Democratic Republic of the Congo have plaintiffs who have filed lawsuits against Tesla and other companies that are buying

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<sup>51</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>52</sup> [https://www.energystar.gov/productfinder/product/certified-boilers/results?formId=02006-3-40-9-65274084&scrollTo=665&search\\_text=&fuel\\_type\\_filter=Propane&brand\\_name\\_isopen=0&efficiency\\_afue\\_filter=AFUE+%E2%89%A5+95&can\\_integrate\\_hot\\_water\\_heating\\_filter=&markets\\_filter=United+States&zip\\_code\\_filter=&product\\_types=Select+a+Product+Category&sort\\_by=efficiency\\_afue&sort\\_direction=desc&currentZipCode=55145&page\\_number=0&lastpage=0](https://www.energystar.gov/productfinder/product/certified-boilers/results?formId=02006-3-40-9-65274084&scrollTo=665&search_text=&fuel_type_filter=Propane&brand_name_isopen=0&efficiency_afue_filter=AFUE+%E2%89%A5+95&can_integrate_hot_water_heating_filter=&markets_filter=United+States&zip_code_filter=&product_types=Select+a+Product+Category&sort_by=efficiency_afue&sort_direction=desc&currentZipCode=55145&page_number=0&lastpage=0)

<sup>53</sup> [https://www.energystar.gov/productfinder/product/certified-furnaces/results?scrollTo=2628.0166015625&search\\_text=&fuel\\_type\\_filter=Propane+Gas&furnace\\_is\\_energystar\\_certified\\_in\\_filter=All&brand\\_name\\_isopen=0&efficiency\\_afue\\_filter=95-96.99&markets\\_filter=United+States&zip\\_code\\_filter=&product\\_types=Select+a+Product+Category&sort\\_by=efficiency\\_afue&sort\\_direction=asc&page\\_number=48&lastpage=44](https://www.energystar.gov/productfinder/product/certified-furnaces/results?scrollTo=2628.0166015625&search_text=&fuel_type_filter=Propane+Gas&furnace_is_energystar_certified_in_filter=All&brand_name_isopen=0&efficiency_afue_filter=95-96.99&markets_filter=United+States&zip_code_filter=&product_types=Select+a+Product+Category&sort_by=efficiency_afue&sort_direction=asc&page_number=48&lastpage=44)

<sup>54</sup> <https://www.energy.gov/energysaver/heat-and-cool/water-heating/tankless-or-demand-type-water-heaters>

<sup>55</sup>

<https://www.energy.gov/sites/prod/files/2015/09/f26/A%20Common%20Definition%20for%20Zero%20Energy%20Buildings.pdf>

cobalt from these locations to make their electric batteries.<sup>56</sup> Non-renewable heavy metals like cobalt and lithium are harmful to the environment both when extracted and at end of life.<sup>57</sup>

## V. Conclusion

Although PGANE supports efforts to protect the environment and reduce emissions, we oppose Massachusetts's Clean Energy and Climate Plan for 2030, as currently drafted. While some strategy actions are better than others, it is clear, in aggregate, this clean energy plan heavily favors electricity at the expense of other energy options and emerging technologies at the risk of stifling future innovations. In doing so, it fails to recognize the many ways that propane can help achieve EEA's underlying goals and policy objectives. We continue to reject the notion that an all-electric future is the best path forward in a decarbonizing world. Ultimately, if these electrification policies are implemented, they will result in reduced business investment, fewer jobs and a retrenchment of clean, low-carbon energy options for consumers.

That said, PGANE welcomes the opportunity to further engage with the Baker Administration to craft sound environmental and climate policies going forward. Thank you again for the opportunity to provide comment.

Respectfully submitted,

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<sup>56</sup> <https://www.business-humanrights.org/en/latest-news/lawsuit-against-apple-google-tesla-and-others-re-child-labour-drc/>

<sup>57</sup> <https://www.atsdr.cdc.gov/phs/phs.asp?id=371&tid=64>

<https://www.theguardian.com/global-development/2019/dec/18/how-the-race-for-cobalt-risks-turning-it-from-miracle-metal-to-deadly-chemical>



Secretary Kathleen A. Theoharides  
Massachusetts Executive Office of Energy and Environmental Affairs  
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Boston, MA 02114

Re: Interim Clean Energy and Climate Plan for 2030

Dear Secretary Theoharides and staff,

The Massachusetts Municipal Wholesale Electric Company (MMWEC) welcomes and appreciates the opportunity to provide feedback on the Interim Clean Energy and Climate Plan for 2030. Specifically, our comments focus on the transportation, buildings and electricity sectors.

MMWEC launched an innovative electric vehicle (EV) charging program back in 2017. In alignment with state priorities, MMWEC has focused on the integration of electric vehicles in municipal light plant (MLP) territories, and has provided incentives on both the purchase of new electric vehicles and home charging infrastructure.

With the plan's ambitious goals of adding up to 1 million additional light duty zero emissions vehicles on the road by 2030 and the end of combustion engine vehicle sales by 2035, MMWEC encourages the development of initiatives to increase EV adoption and EV charging infrastructure development, specifically related to fleet charging and DC fast charging, as both will be critical to achieving the stated goals.

MMWEC supports initiatives to increase building electrification and the expanded installation of heat pumps. MMWEC has offered heat pump incentive programs for both central and mini-split heat pumps for over five years, and continues to look for ways to increase adoption. Due to the high up-front cost of heat pumps, they may be out of reach for many; financing and other programs should be explored and developed.

Regarding both transportation and building energy efficiency, MMWEC supports plans to develop a major, comprehensive public awareness campaign to educate consumers on the benefits of electric vehicles, building electrification and energy efficiency.

MMWEC also supports the plan's electricity sector goals, which generally align with the legislature's compromise climate bill. As you know, the current version of the climate bill, S.9, creates a greenhouse gas emissions standard (GGES) for MLPs which was endorsed by a coalition of MLPs through the Municipal Electric Association of Massachusetts. The MLPs, through MEAM, first proposed a greenhouse gas emissions standard for MLPs in early 2019. In addition, several of MMWEC's member MLPs have already adopted their own GGES through local control and vote of their light department boards/commissions.

MMWEC and its Member MLPs have a long history of incorporating carbon-free resources into their power portfolios, dating back to the 1980s, and continue to integrate carbon-free energy today. MMWEC and its Members will continue on their path to decarbonization.

We thank you for this opportunity to comment on the *Interim Clean Energy and Climate Plan for 2030*, and are always available to answer questions or discuss ideas. For further information, please contact:

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#### About MMWEC

Created in 1969, MMWEC is the Joint Action Agency for Massachusetts municipal utilities. In 1976, MMWEC became a non-profit, public corporation and political subdivision of the Commonwealth of Massachusetts, empowered by state law to issue tax-exempt revenue bonds to finance ownership interests in energy facilities. Today, MMWEC provides its members with a variety of services, including power supply planning and management; resource development and financing; risk management; and wholesale power market representation. Twenty Massachusetts municipal utilities are members of the MMWEC organization, and 28 are participants in MMWEC's power supply projects.





March 18, 2021

## Massachusetts AFL-CIO Comments on the Interim Clean Energy and Climate Plan for 2030

On behalf of hundreds of thousands of working people from almost every sector and community in Massachusetts, thank you for the opportunity to submit comments on the Commonwealth's Interim Clean Energy and Climate Plan for 2030. To help ensure timely, cost-effective completion of high-quality projects that support our economy while fighting climate change, we urge the inclusion of high-quality employment and procurement policies on all of the work and materials needed to achieve this energy transition.

Requiring prevailing wages and Project Labor Agreements will ensure high-quality jobs during the construction phase of the project, utilizing the most highly-trained and safest workforce available. PLAs also ensure the most diverse and inclusive workforce available; a workforce that has the economic stability to invest in our local communities where these projects will happen. Requiring Project Labor Agreements (PLA) is also important because PLAs bring coordinated, proactive planning to complex projects, ensure that the most productive, highly-trained and safest craft labor is available, can enshrine hiring goals to ensure women and people of color are working on these projects, and provide other important benefits to local communities.

In addition to paying prevailing wage for construction and building service work, and participating in PLAs, we urge that all potential bidders and employers be required to:

- Disclose whether it and each of its contractors and subcontractors on this project, have previously contracted with a labor organization, as defined by Massachusetts General Laws, c. 150A and/or the National Labor Relations Act, Section 2, in the Commonwealth or elsewhere;
- Specify whether it and each of its contractors and subcontractors on this project participates in a state or Federally certified apprenticeship program and the number of apprentices the apprenticeship program has trained to completion for each of the last five (5) years; and
- Include any detailed plans for assuring labor harmony during all phases of the construction, development, and operation of the project.
- Require potential developers and contractors to make important disclosures during the bidding process, including:
  - A plan to enhance workforce diversity, equity, and inclusion
  - Whether they utilize apprentice training in order to create career pathways
  - Certification they are in compliance with anti-discrimination laws
  - Certification they are in compliance with wage & hour and employee misclassification laws.

The adoption of the *The Clean Energy Workforce Standards and Accountability Act* ([HD. 3200](#) / [SD. 1801](#)), currently in the State Legislature, would help to achieve some of these standards.

In addition to making sure that green jobs are good jobs, the Commonwealth must help transition workers in fossil fuel intensive industries so that we don't worsen income inequality and shrink the middle class in our noble efforts to fight climate change.

According to the Commonwealth's December 2020 *Economic and Health Impacts Report on the 2050 Decarbonization Roadmap Study*, a net loss of 20,000 jobs in the gas distribution sector alone is projected by the year 2050 in Massachusetts. A just transition to a clean energy economy must ensure high-road economic development and quality jobs in renewable energy; allow for energy policy options that will retain the skilled energy workforce currently employed in the state and utilize existing energy infrastructure; and be anchored by a strong safety net for workers who are displaced from the traditional energy industry.

We encourage the full adoption of *An Act relative to a just transition to clean energy* ([HD.2446](#) / [SD.1800](#)), currently filed in the State Legislature. This important bill does the following:

- Creates an Office of Just Transition to assist workers who have been displaced due to the transition from fossil fuels to clean energy and provide them with immediate access to employment and training opportunities in the clean energy industry.
- Creates a Just Transition Advisory Committee tasked with developing a comprehensive Just Transition Plan for the Massachusetts energy sector.
- Implements "Climate Adjustment Assistance" benefits that are similar in type and duration to federal Trade Adjustment Assistance benefits, in order to financially support and provide enhanced training opportunities to workers displaced from industries dependent on fossil fuels.
- Requires employers to submit a Workforce Reduction Plan any time job dislocations occur as a result of the transition from fossil fuels.

The environmental crisis we are in now was created and fueled by the same corporations and billionaires that are the leading forces of income inequality. Any part of fighting climate change should include taxing these corporations and ultra-wealthy to help fund vital upgrades to our Commonwealth's public infrastructure. Thank you for your consideration.

Sincerely,  
Steven Tolman,  
President,  
Massachusetts AFL-CIO



THE COMMONWEALTH OF MASSACHUSETTS  
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March 12, 2021

**Submitted online via [mass.gov](http://mass.gov)**

Kathleen Theoharides  
Secretary of Energy and Environmental Affairs  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

**RE: Comments on Interim Clean Energy and Climate Plan for 2030**

Dear Secretary Theoharides:

The Massachusetts Attorney General's Office (AGO) appreciates the efforts of the Executive Office of Energy and Environmental Affairs (EEA) to address climate change and decarbonize the Commonwealth. The AGO recognizes the many challenges involved in meeting Massachusetts's nation-leading climate targets and supports EEA's goal of achieving these limits equitably and affordably across all sectors. As EEA finalizes its 2030 planning effort, the AGO offers the following comments on EEA's Interim Clean Energy and Climate Plan for 2030 (Interim CECP or Plan) to help ensure the Commonwealth's decarbonization planning achieves Massachusetts's ambitious emissions-reduction goals while expressly promoting climate justice and redressing past harms to environmental justice (EJ) communities.<sup>1</sup>

As EEA appreciates, we are facing a rapidly accelerating climate crisis, and the dire consequences of climate change will disproportionately impact EJ communities that already bear a disproportionate burden of environmental and public health hazards here in Massachusetts and beyond.<sup>2</sup> The last seven years have been the warmest years on record, with 2020 tied for the

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<sup>1</sup> These Comments use the terms "climate justice" and "environmental justice" as defined in the Climate Justice Working Group's Recommendations to the Global Warming Solutions Act Implementation Advisory Committee. See Climate Justice Working Group, *Recommendations to Improve the Master Policy List to Address Climate Justice* (Aug. 7., 2020) ("CJWG Recommendations"), <https://www.mass.gov/doc/climate-justice-working-group-policy-recommendations/download>.

<sup>2</sup> See U.S. Env'tl. Prot. Agency, *Climate Change, Health, & Environmental Justice* (May 2016), <https://www.cmu.edu/steinbrenner/EPA%20Factsheets/ej-health-climate-change.pdf>; USGCRP, *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*, Ch. 9: Populations of Concern (Crimmins, A., et al., eds., 2016) ("Climate Health Impacts"), <https://health2016.globalchange.gov/>; Off. of Mass. Attorney Gen. Maura Healey, *COVID-19's Unequal Effects in Massachusetts* 3, 7 (2020), <https://www.mass.gov/doc/covid-19s-unequal-effects-in-massachusetts/download>; Exec. Office of Energy and

lead.<sup>3</sup> In 2020, the nation endured a record hurricane season, and we suffered prolonged significant or critical drought conditions in every corner of the Commonwealth.<sup>4</sup> Massachusetts will continue to experience an increasing number of days of extreme heat, particularly in urban areas with low tree cover.<sup>5</sup> And sea level rise is predicted to be higher on the East Coast than the global average,<sup>6</sup> with Massachusetts projected to experience an increase of between 4.0 and 10.2 feet between 2000 and 2100.<sup>7</sup>

The Intergovernmental Panel on Climate Change (IPCC) has warned that, to have a roughly 50 percent chance of limiting warming to 1.5-2.0 degrees Centigrade, global emissions must be reduced *by nearly half* in the next ten years, at least 80 percent by 2050, and then decline to zero or become net negative.<sup>8</sup> We must act swiftly to turn the tide.

### **AGO Comments on the Interim CECP<sup>9</sup>**

The AGO appreciates EEA's pursuit of our shared commitment to address the climate crisis. The finalization of a bold, aggressive CECP is an essential step toward making those changes a reality. As EEA aptly recognizes, however, the transition to a new low-carbon economy must not "exacerbate but instead assist in closing the health and economic disparities experienced in Environmental Justice communities and communities of color."<sup>10</sup> The AGO offers the following brief comments on the Interim CECP to help ensure that the final plan directs an equitable and affordable transition that secures and maximizes emissions reductions, promotes climate justice, and redresses past harms to the Commonwealth's EJ communities.<sup>11</sup>

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Envtl. Affairs, Environmental Justice Policy (Jan. 31, 2017),

[https://www.mass.gov/files/documents/2017/11/29/2017-environmental-justice-policy\\_0.pdf](https://www.mass.gov/files/documents/2017/11/29/2017-environmental-justice-policy_0.pdf).

<sup>3</sup> NASA, *2020 Tied for Warmest Year on Record, NASA Analysis Shows* (Jan. 14, 2021), <https://www.nasa.gov/press-release/2020-tied-for-warmest-year-on-record-nasa-analysis-shows>.

<sup>4</sup> See NOAA, *2020 Atlantic Hurricane Season takes infamous top spot for busiest on record* (Nov. 10, 2020), <https://www.noaa.gov/news/2020-atlantic-hurricane-season-takes-infamous-top-spot-for-busiest-on-record>; Massachusetts September 2020 Drought Status (Oct. 9, 2020), <https://www.mass.gov/doc/september-2020/download>.

<sup>5</sup> See Northeast Climate Adaptation Science Ctr., *Massachusetts Climate Change Projections-Statewide and for Major Drainage Basins* 4-5, 7 (Mar. 2018) ("MA Climate Projections"), [https://eea-nescaum-dataservices-assets-prd.s3.us-east-1.amazonaws.com/resources/production/MA%20Statewide%20and%20MajorBasins%20Climate%20Projections\\_Guidebook%20Supplement\\_March2018.pdf](https://eea-nescaum-dataservices-assets-prd.s3.us-east-1.amazonaws.com/resources/production/MA%20Statewide%20and%20MajorBasins%20Climate%20Projections_Guidebook%20Supplement_March2018.pdf).

<sup>6</sup> See USGCRP, *Climate Science Special Report: Fourth National Climate Assessment*, Vol. I, at 10 (D.J. Wuebbles et al. eds., 2017), <https://science2017.globalchange.gov/>. The Fourth National Climate Assessment is a two-volume peer-reviewed assessment released by the U.S. Global Change Research Program coordinated by 13 federal agencies and representing the work of over 200 governmental and nongovernmental experts.

<sup>7</sup> See MA Climate Projections at 15.

<sup>8</sup> Intergovernmental Panel on Climate Change, *Global Warming of 1.5° C – Summary for Policy Makers*, SPM-14, 16 (Oct. 6, 2018), [http://report.ipcc.ch/sr15/pdf/sr15\\_spm\\_final.pdf](http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf); see also Interim CECP at 4.

<sup>9</sup> These comments are limited in scope and not intended to respond to every aspect of the Plan. Silence by the AGO in regard to any particular part of the Plan should not be interpreted as support or opposition.

<sup>10</sup> Interim CECP at 10.

<sup>11</sup> The AGO further urges EEA to meaningfully incorporate into the Plan the recommendations of its Climate Justice Working Group. See *infra* n.1.

**Transforming Our Transportation Systems:** The transportation sector provides a unique opportunity to at once reduce greenhouse gas emissions and improve quality of life and public health in EJ communities. While electrifying passenger cars and trucks is indeed critical to reducing transportation-sector emissions of greenhouse gases and other harmful pollutants,<sup>12</sup> expansion and electrification of Massachusetts public transit systems and school transportation operations and robust ridesharing programs are needed to ensure that the benefits of clean transportation are equitably shared across the Commonwealth. Such changes would, among other benefits, expand low-cost transportation options, encourage mode shifts, reduce reliance on passenger vehicles, and mitigate emissions of harmful pollutants along transportation corridors that disproportionately harm EJ communities.<sup>13</sup> Further, the AGO emphasizes that low- and moderate-income consumer programs for electric vehicles must do far more than current incentive programs to make such vehicles and charging infrastructure available and affordable for all. Improvements to such programs must be specific, concrete, and actionable.

**Transforming our Buildings:** As EEA acknowledges, increasing building energy efficiency and electrifying end uses, especially heating, represent a significant opportunity to decrease emissions from the Commonwealth's building sector.<sup>14</sup> The AGO is supportive of EEA's plans to limit fossil fuel heating system incentives in the 2022-2024 Three-Year Energy Efficiency Plans, to end all fossil fuel heating system incentives by 2024, and to increase electrification through Mass Save® programs via air source and ground source heat pump incentives and consumer education.<sup>15</sup> The Plan's Strategy Actions, however, must include concrete and ambitious steps to equitably expand heat pump access to EJ communities as well as low- and moderate-income renters and homeowners. For example, the Plan must address the barriers presented by potential near-term increased operational costs associated with heat pump installation by offering additional incentives, policy measures, and specific funding sources designed to mitigate or eliminate such costs.<sup>16</sup>

**Transforming Our Energy Supply:** Electricity demand is projected to more than double by 2050 due to the widespread electrification of building and transportation services.<sup>17</sup> It is thus critical that EEA fully evaluate and address important equity and affordability issues—particularly for EJ communities—as the total number of gas customers declines across the Commonwealth. For example, the Plan must include measures to ensure that those least able to pay for home heating electrification do not bear the burden of rate increases and are provided opportunities to switch from fossil fuel heating systems to carbon-neutral alternatives.<sup>18</sup>

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<sup>12</sup> For example, the Low Emissions Vehicle program, including requirements for Zero Emissions Vehicles, has been and continues to be a crucial piece of Massachusetts's efforts to attain and maintain the National Ambient Air Quality Standards for ozone by reducing emissions of VOCs and NOx.

<sup>13</sup> See Boehmer et al., *Residential Proximity to Major Highways — United States CDC Report* (2010), <https://www.cdc.gov/mmwr/preview/mmwrhtml/su6203a8.htm#Fig>.

<sup>14</sup> Interim CECP at 27.

<sup>15</sup> *Id.* at 31-32.

<sup>16</sup> *Id.* at 28; *Investigation by the Dep't of Pub. Utils. on its own Motion into the Role of Gas Local Distribution Cos. as the Commonwealth Achieves its Target 2050 Climate Goals*, AGO Petition at 11-12, D.P.U. 20-80 (June 4, 2020) ("D.P.U. 20-80 Petition").

<sup>17</sup> Interim CECP at 36.

<sup>18</sup> D.P.U. 20-80 Petition at 11-12.

The AGO also supports EEA's commitment to a clean energy future. But the Plan fails to ensure that the benefits of clean distributed energy resources (DER) like solar, which are essential to meeting the Commonwealth's 2050 goals,<sup>19</sup> are available to the Commonwealth's low-income utility customers. Current incentives—including the Solar Massachusetts Renewable Target (SMART) program<sup>20</sup>—have not spurred needed investments or program directives that fairly benefit low- or moderate-income customers.<sup>21</sup> Further, the AGO strongly encourages EEA to ensure that the Plan prioritizes comprehensive short- and long-term DER integration planning for a resilient grid<sup>22</sup> to avoid a cycle of costly and unnecessary utility investments.<sup>23</sup>

Of course, the Plan's reliance on clean energy policies and programs will only achieve the required emissions reductions if those policies and programs incentivize truly low- or no-emitting generation. The AGO remains concerned, however, that the Department of Energy Resources' recent effort to expand eligibility criteria for biomass generation units under the Commonwealth's Renewable Energy Portfolio Standards (RPS) would *increase*—not decrease—greenhouse gas emissions and incentivize polluting generation in an EJ community in Springfield,<sup>24</sup> the asthma capital of the nation.<sup>25</sup>

Finally, the AGO emphasizes the need to consider and avoid the impacts of energy infrastructure siting decisions on EJ communities,<sup>26</sup> which have historically been targeted for the siting of controversial energy infrastructure, but left out of conversations that affect the health of their neighborhoods.<sup>27</sup> With expanded transmission infrastructure needed for a decarbonized electric grid, the Plan must ensure both that EJ populations have meaningful opportunities to contribute to siting decisions and that siting decisions do not unfairly impact those communities.

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<sup>19</sup> See Interim CECP at 37.

<sup>20</sup> Solar Mass. Renewable Target Program Guideline Regarding Low Income Generation Units, <https://www.mass.gov/doc/low-income-generation-units-guideline-october-2020/download>.

<sup>21</sup> See, e.g., *Joint Petition of Elec. Distribution Cos. for Approval of Model Solar Mass. Renewable Target Tariff*, NSTAR Elec. Co. d/b/a Eversource Energy SMART Participation Q. Rep., D.P.U. 17-140 (Jan. 29, 2021).

<sup>22</sup> See Interim CECP at 41.

<sup>23</sup> The AGO has proposed near- and long-term solutions to address current DER interconnection issues based on an initial straw proposal developed by the Department of Public Utilities. See *Investigation by the Dep't of Pub. Utils. on its own Motion into Elec. Distribution Cos.' (1) Distributed Energy Resource Planning and (2) Assignment and Recovery of Costs for the Interconnection of Distributed Generation*, AGO Initial Comments, D.P.U. 20-75 (Dec. 23, 2020).

<sup>24</sup> See Off. of Mass. Attorney Gen. Maura Healey, Comments to the Dep't of Energy Res. on Draft Regs. Amending the Renewable Portfolio Standard Class I and II Regs., 225 C.M.R. §§ 14.00 *et seq.* and 15.00 *et seq.* (H.5169) (Dec. 23, 2020) ("AGO RPS Comments"), <https://www.mass.gov/doc/biomass-comments/download>.

<sup>25</sup> Asthma and Allergy Found. Am., *Asthma Capitals 2019: The Most Challenging Places to Live with Asthma*, 33 (2019), <https://www.aafa.org/media/2426/aafa-2019-asthma-capitals-report.pdf>.

<sup>26</sup> See, e.g., Interim CECP at 10, 42.

<sup>27</sup> See, e.g., *Project Change Request by NSTAR Elec. Co. d/b/a Eversource Energy*, Letter from Members of the Cong. Delegation, the State Delegation, and the Boston City Council Regarding the Proposed Eversource Substation in East Boston, EFSB 14-04/D.P.U.14-153/154 (Dec. 7, 2020).

**Protecting Our Natural and Working Lands:** The AGO commends EEA’s aim to achieve “no net loss” of Massachusetts farm and forest land through 2030 and to account for the critical carbon sequestration role of Massachusetts forests in reducing our carbon footprint.<sup>28</sup> The AGO urges EEA, however, to ensure that its Resilient Lands Initiative and other policies and programs designed to implement those goals follow a transparent, inclusive public stakeholder process, with ample outreach to and input from EJ communities. Such policies must also reflect a science-based approach to forest conservation, including accurate assessment of the full lifecycle emissions impact of any anticipated forest “management” activities.<sup>29</sup> Additionally, as noted above, Massachusetts energy policy should not incentivize forest harvest for biomass combustion that not only immediately “releases all of the stored carbon back into the atmosphere,” but also eliminates an important carbon sink going forward.<sup>30</sup> Finally, the AGO urges EEA to prioritize forest and wetlands protection in and near EJ areas to mitigate the impacts of climate change—including the “heat island” effect of low tree cover<sup>31</sup>—and to secure for those communities the many, well-documented public health and environmental benefits of greenspace.<sup>32</sup> Commonwealth land use policy accordingly should reflect due focus on, among other things, protecting existing mature trees and greenspace, restoring and protecting wetlands, and expanding tree planting programs throughout EJ communities.<sup>33</sup>

### Conclusion

The AGO appreciates the opportunity to comment on the Interim CECP and looks forward to continued collaboration as we seek to equitably address the climate crisis.

Sincerely,

/s/ Rebecca Tepper

Rebecca Tepper

Chief, Energy and Environment Bureau

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<sup>28</sup> See Interim CECP at 48-49. Indeed, Massachusetts forests have a “particularly high untapped capacity for carbon storage and sequestration” because of “high growth,” “low decay rates,” and no significant harvest in the last 75-150 years. See William Moomaw et al., *Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good*, 2 FRONT. FOR. GLOB. CHANGE 27, 4-5 (June 11, 2019), <https://www.frontiersin.org/articles/10.3389/ffgc.2019.00027/full>.

<sup>29</sup> See Exec. Office of Energy and Env'tl. Affairs, *Draft Resilient Lands Initiative Vision and Strategy Executive Summary* (July 29, 2020).

<sup>30</sup> Interim CECP at 51; see generally AGO RPS Comments.

<sup>31</sup> Climate Health Impacts at 252.

<sup>32</sup> See, e.g., Maas, J., et al., *Morbidity is related to a green living environment*, 63 J. EPIDEMIOLOGY & CMTY. HEALTH 12, 967-73 (Oct. 15, 2009); Jennings, V., et al., *Advancing sustainability through urban green space: cultural ecosystem services, equity, and social determinants of health*, 13 INT. J. ENVTL. RES. PUB. HEALTH 2, 3-7 (Feb. 5, 2016); Roe, J., et al., *Green Space and Stress: Evidence from Cortisol Measures in Deprived Urban Communities*, 10 INT. J. ENVTL. RES. PUB. HEALTH 4086-4103 (Sept. 2, 2013).

<sup>33</sup> CJWG Recommendations at 10-16.



February 19, 2021

Ms. Kathleen Theoharides  
Secretary  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St., Suite 900  
Boston, MA 02114

Re: Massachusetts's Clean Energy and Climate Plan for 2030

### **COMMENTS OF THE NATIONAL PROPANE GAS ASSOCIATION**

On behalf of the National Propane Gas Association (NPGA), which represents propane marketers, suppliers and equipment manufacturers across the country, including in Massachusetts, we appreciate the opportunity to provide comments regarding the proposed Clean Energy and Climate Plan for 2030 (2030 CECP). The propane industry in Massachusetts generates more than \$615 million in economic activity annually.<sup>1</sup>

NPGA supports efforts to promote energy efficiency, reduce greenhouse gas (GHG) emissions, improve air quality, and foster healthier, more vibrant communities. However, we share the sentiments expressed by the Propane Gas Association of New England (PGANE) about the 2030 CECP and, like PGANE, are unable to support the plan in its current form. And unless major revisions are undertaken, we too will be forced to oppose it.

The propane industry is overwhelmingly composed of small, independent businesses working to meet the unique energy needs of their communities. Unfortunately, the 2030 CECP is focused on reducing energy choice and creating a playing field heavily tilted towards electricity, at the expense of other thermal options, like propane. In doing so, state officials overlook how these policy-driven electrification efforts will impact consumers, businesses and the environment.

The narrative that decarbonization is only possible through electrification is simply untrue. To effectively combat climate change, we must be pragmatic and realize that there are multiple paths forward to reduce emissions and reach our sustainability goals.

#### **I. Issues with 2030 CECP**

The 2030 CECP seeks a massive overhaul of the energy sector and calls for the electrification of space and water heating and the replacement of furnaces and boilers powered by propane and other non-

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<sup>1</sup> [https://npga.org/wp-content/uploads/2020/06/Massachusetts\\_Propane-1-Pager\\_2020.pdf](https://npga.org/wp-content/uploads/2020/06/Massachusetts_Propane-1-Pager_2020.pdf)



electric energy options.<sup>2</sup> To compel building owners to switch fuels, under Strategy B3, officials would impose a long-term, declining cap on emissions from heating fuels, including propane and natural gas.<sup>3</sup> The report glosses over the fact that our electrical grid is extremely inefficient and energy is lost during each step of the delivery process (i.e., power generation, transmission, distribution). These inherent inefficiencies simply mean more GHGs are released. For context, the federal government's Energy Star Program gives propane, which is a primary energy source, a source-site ratio of 1.01, compared to 2.80 for electricity from the grid.<sup>4</sup> This means it takes 2.80 units of electricity to produce and deliver one unit of energy to a home, compared to only 1.01 for propane. Propane is much more efficient at delivering energy than drawing electricity from the grid.

Officials do little to address the potential costs associated with their decarbonization plan. In 2019, Massachusetts had the highest average residential price for electricity in New England; this rate was 40 percent more than the U.S. average.<sup>5</sup> And widespread electrification, which this proposal would advance, will impact the variability and shape of the electric load.<sup>6</sup> As such, utilities must dedicate more time and effort to address these challenges. This could further impact electric rates.

The thermal electrification strategy relies heavily on the adoption of heat pumps by energy customers.<sup>7</sup> Unfortunately, the energy plan does not adequately address the concerns of relying on heat pumps to provide primary space heating in New England. Nor does it properly discuss the secondary heating sources that many homes and businesses will need to cope with the coldest days of winter.

## **II. Overlooked Propane has Eco-friendly Attributes**

We also reject the perceived notion that, from an environmental perspective, there is no difference between thermal fuels. Propane has many positive environmental attributes that should be recognized. Propane burns cleanly and has a low-carbon content.<sup>8</sup> It will not contaminate soil, surface water, or ground water because it vaporizes the moment it is released from a pressured container.<sup>9</sup> It also prevents tree felling and deforestation. For these reasons and more, propane is designated an approved clean, alternative fuel under the Clean Air Act Amendments of 1990 and the National Energy Policy Act of 1992.

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<sup>2</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>3</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>4</sup> <https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf>

<sup>5</sup> [https://www.eia.gov/electricity/annual/html/epa\\_02\\_10.html](https://www.eia.gov/electricity/annual/html/epa_02_10.html)

<sup>6</sup> <https://www.nrel.gov/docs/fy17osti/68214.pdf>

<sup>7</sup> <https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download>

<sup>8</sup> <https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>

<sup>9</sup> [https://afdc.energy.gov/fuels/propane\\_basics.html](https://afdc.energy.gov/fuels/propane_basics.html)

As an engine fuel powering vehicle fleet, such as school buses, propane can reduce emissions and lower the carbon intensity of our transportation fuel.<sup>10</sup> Propane buses can improve air quality, reduce transportation costs, and create a more comfortable cabin experience.<sup>11</sup>

In addition, the industry continues to increase production of renewable propane. Renewable propane is a by-product of renewable diesel production, and can be derived from biomass, animal fats and vegetable oils.<sup>12</sup> It has the same molecular structure as traditional propane and can safely be used in vehicle engines, including those certified to the California Air Resources Board's (CARB) ultra-low NOx standard.<sup>13</sup>

And as Massachusetts evaluates ways to reduce emissions of hydrofluorocarbons (HFCs), which are extremely potent greenhouse gases,<sup>14</sup> they should not overlook R-290 – refrigerant grade propane. R-290 is a natural, ozone- and climate-friendly alternative refrigerant.<sup>15</sup>

To reiterate, not all thermal fuels are the same. And propane's eco-friendly attributes are quite harmonious with the Commonwealth's desire to decarbonize and promote a sustainable future.

### III. Conclusion

While NPGA supports efforts to protect the environment and reduce emissions, we have serious reservations about the draft Clean Energy and Climate Plan for 2030. And like PGANE, unless major revisions are undertaken, we will oppose it. The focus on electrification is shortsighted. If these policies are implemented, they will result in reduced business investment, fewer jobs, and a retrenchment of clean, low-carbon energy options for consumers.

Thank you again for the opportunity to provide comment.

Respectfully submitted,



Lesley Brown Garland  
Vice President, State Affairs

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<sup>10</sup> <https://cdn.propane.com/wp-content/uploads/2019/07/WVU-School-Bus-Emissions-Final-Report-June-2019.pdf>

<sup>11</sup> <https://afdc.energy.gov/case/3075>

<sup>12</sup> [https://afdc.energy.gov/fuels/propane\\_production.html](https://afdc.energy.gov/fuels/propane_production.html)

<sup>13</sup> <https://www.roushcleantech.com/roush-cleantech-launches-first-available-near-zero-emissions-engines-fueled-by-renewable-propane/>

<sup>14</sup> <https://www.epa.gov/snap/reducing-hydrofluorocarbon-hfc-use-and-emissions-federal-sector-through-snap>

<sup>15</sup> <https://www.epa.gov/snap/substitutes-household-refrigerators-and-freezers>



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February 22, 2021

In response to the Massachusetts Executive Office of Energy and Environmental Affairs' request for public comments on the interim 2030 Clean Energy and Climate Plan (CECP), the Town of Berlin offers the following:

**Comments from the Town of Berlin Agricultural Commission:**

One of the observations that has come out of the COVID-19 pandemic is the recognition by consumers and officials for the need for more locally sourced food.

This past season, the farming community stepped up to this challenge by providing lots of fresh vegetables and fruit. If this trend continues, there more than likely will be the need for more greenhouses in this state. Most greenhouses are currently heated with fossil fuels such as fuel oil, natural gas and propane. Chapter 3 of the CECP identifies the need for a widespread deployment of heat pumps for households and other buildings to meet the greenhouse gas emission objectives. Based on the current technology, the Commission does not believe that heat pumps are practical for heating greenhouses.

Although the report acknowledges that agricultural activity in Massachusetts is much smaller than states like California, it would seem appropriate that the report should recognize the potential expansion of agriculture and greenhouses in this state and address what heat sources would be appropriate.

**General comments on the CECP's Strategy Actions:**

T1 Strategy Actions: The Town of Berlin's Complete Streets Tier II Prioritization Plan and Master Plan memorialize the community's desire to increase safe pedestrian and bicycle access in the coming years. This aligns well with the Commonwealth's proposed investment in clean transportation strategies; specifically, the Transportation and Climate Initiative Program's (TCI-P) proposed investments in improved public transportation, safe bike and pedestrian infrastructure.

T2 Strategy Actions: As a designated Massachusetts Green Community, the Town of Berlin continually strives to achieve energy efficiency and reduced carbon emissions. Zero Emission Vehicles (ZEVs) require a higher up-front investment than traditional vehicles, which has prevented many municipalities from investing in these highly efficient vehicles. Berlin has

begun a police vehicle replacement program comprised only of hybrid front-line vehicles and our Police Chief's car is an electric vehicle. Municipalities with limited financial resources will need access to rebate and incentive programs to comply with the MassDEP's adoption and implementation of:

1. the California Advanced Clean Cars II Standard (all new LDV sales must be 100% ZEV by 2035) by the end of the year in which the standard is finalized by California.
2. the ZEV purchase mandates of the California Advanced Clean Trucks rule by Dec. 31, 2021 and the Advanced Clean Fleets rule by the end of the year in which the rule is finalized by California, and
3. the multi-jurisdictional Zero Emission Medium- and Heavy-Duty Vehicle Memorandum of Understanding and Action Plan to provide a framework for achieving 30% of all new truck and bus sales being ZEVs by 2030 and 100% by 2050.

T3 Strategy Actions: As noted above, continued rebate and incentive programs, including the Massachusetts Electric Vehicle Incentive Program (MassEVIP) and the Massachusetts Offers Rebates for Electric Vehicles (MOR-EV) program administered by the Department of Energy Resources, will be critical in mitigating the cost burden for private consumers, municipalities and other public agencies.

T4 Strategy Actions: The Town of Berlin intends to install EV charging stations at its Public Safety Complex and Town Offices for the benefit of residents. Efforts by the Commonwealth to assure EV charging financial viability through various incentive programs and restructuring of utility demand rates will improve residential and public agency movement toward EV purchases. Additionally, as noted in T5 Strategy Actions, efforts must include raising consumer awareness and providing technical assistance opportunities.

B1 & B2 Strategy Actions: A phased approach and municipal stakeholder involvement are both critical to DOER's implementation of any new proposed high-performance stretch code, building envelope retrofit and clean heating system standards. Municipalities, the building design and construction industry, and consumers must be given sufficient time to transition to the enhanced standards.

Sincerely,

Margaret Nartowicz, Town Administrator

For the Town of Berlin

*The Commonwealth of Massachusetts*  
STATE HOUSE, BOSTON, MA 02133-1054

**MICHELLE CICCOLO, HOUSE CHAIR**  
STATE REPRESENTATIVE  
15<sup>TH</sup> MIDDLESEX DISTRICT  
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**JASON M. LEWIS, SENATE CHAIR**  
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**ZERO WASTE CAUCUS**

March 17, 2021

Secretary Kathleen A. Theoharides  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114

RE: Draft Clean Energy and Climate Plan (CECP) for 2030

Dear Secretary Theoharides:

Thank you for the opportunity to comment on the Draft CECP. We write in our capacity as the co-chairs of the legislature's Zero Waste Caucus, which was formed early last year with the goal of advancing policies to reduce solid waste disposal. Our caucus is a bipartisan, bicameral group comprised of over 40 legislators who share the belief that aggressive actions must be taken to curtail the amount of waste generated by the Commonwealth. Mitigating the harmful impacts of incineration on public health and reducing the toxic chemicals that are released into the environment as a result are essential policy objectives, especially in the context of concern for our residents who live in environmental justice communities.

The CECP is a thoughtful and comprehensive plan, and we appreciate the effort EOE and its staff have put into developing strategies to advance sound environmental policies to help move the Commonwealth to a net-zero future. In Section 5.2 of the CECP entitled "Getting to 45% in 2030: Stabilizing emissions," the plan calls for holding steady in the non-energy emissions category. While this might at first seem reasonable, we believe that the Commonwealth can and should do better than merely holding steady over this time period given that Massachusetts' population is expected to grow over this decade. With the MassDEP's soon to be finalized Solid Waste Master Plan (SWMP), there are many strategies that can be deployed to reduce waste and, in so doing, reduce emissions from this sector.

Strategy N2 in the CECP calls on MassDEP to increase standards on the municipal waste combustors (MWCs) at the time these facilities are seeking to expand or rebuild. Given that six out of seven of the MWCs are in or adjacent to environmental justice communities, we feel this approach fails to recognize the urgency of reducing toxic chemicals from being released into our

air by incineration. We believe the CECP can be greatly improved by implementing the following strategies relative to reducing emissions from solid waste:

- Adopt policies to completely phase out incineration and other high heat facilities over time and require MWCs to meet existing emissions standards by 2030.
- Prohibit any new high heat facilities from being built in the Commonwealth.
- Require EEA and DOER to amend the renewable portfolio standard to end market subsidies of energy produced by MWCs, since waste is not a renewable source.
- Support waste reduction and diversion policies proactively.

Adopting Zero Waste policies would have a far more beneficial impact on the environment than continuing with the present course. Pursuing zero waste alternatives, such as composting and recycling, could divert the majority of materials from going to landfills or MWCs.<sup>1</sup> With better recycling, nearly 70% of the municipal solid waste that is presently being incinerated could be eliminated.<sup>2</sup> Moreover, the MWCs are not an efficient use of energy and the research suggests that practices that pursue reduction of waste, coupled with recycling and composting, actually conserve three to five times more energy, per ton of waste, than incineration can generate.<sup>3</sup> This is also why we believe subsidies for energy generated from MWCs should be eliminated.

MassDEP has set itself a goal in the Draft 2030 SWMP to reduce solid waste by 90% between now and 2050. The CECP also acknowledges that if and when this occurs, the projected waste that would be produced by the Commonwealth will not need the full capacity of all seven MWCs to remain on-line. By pursuing a more aggressive waste reduction strategy that delivers a 90% reduction before the year 2050, it would then be possible to phase out more of our incinerators on a shorter timeline.

Relative to supporting waste reduction and diversion, we offer the following suggestions we made to MassDEP during the drafting of its plan:

- *Pay-As-You-Throw*  
MassDEP has the power to require unit-based pricing for trash throughout the state and should implement it as soon as possible. These Pay-As-You-Throw (PAYT) or Save-Money-And-Reduce-Trash (SMART) programs reduce trash by 42-54%, according to a 2018 study from the University of New Hampshire and would save municipalities tremendous amounts of money. Further, there is no evidence that Pay-As-You-Throw programs increase illegal dumping.<sup>4</sup>

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<sup>1</sup> See Massachusetts DEP, Overall Waste Composition By Primary Material Category—Winter and Fall 2016 Sampling, <https://www.mass.gov/doc/summary-of-waste-combustor-class-ii-recycling-program-waste-characterization-studies-includes/download>; See Tellus Institute, *supra* note [1], at 1.

<sup>2</sup> See Massachusetts DEP, Overall Waste Composition By Primary Material Category—Spring and Summer 2019 Sampling, <https://www.mass.gov/doc/summary-of-waste-combustor-class-ii-recycling-program-waste-characterization-studies-includes/download>.

<sup>3</sup> Marie Donahue, Institute for Local Self-Reliance, Waste Incineration: A Dirty Secret in How States Define Renewable Energy 11 (2018), <https://ilsr.org/wp-content/uploads/2018/12/ILSRIncinerationFinalDraft-6.pdf>.

<sup>4</sup> The Recycling Foundation, (Accessed August 8, 2020), [payasyouthrow.org](http://payasyouthrow.org), <http://payasyouthrow.org/faqs/#toggle-id-1>

- Enforce Existing Waste Bans  
According to MassDEP, 40% of the 5.7 million tons of waste Massachusetts disposes of every year are Waste Ban items under 310 CMR 19.00. In other words, they are prohibited from being burned or buried, yet they are. MassDEP should commit to improving enforcement and eliminating this disposal. In other words, improving enforcement to block 90% of these materials from landfills and incinerators would decrease disposal by more than *two million tons a year*. Given that enforcement takes place at a few dozen facilities, this is a straightforward and achievable goal.
- Composting  
Lastly, organic waste makes up almost one-third of the entire waste stream. As the heaviest component of our waste stream, it also costs the most to dispose of in a landfill or incinerator. Thanks to MassDEP's Commercial Food Waste Ban, the Commonwealth diverts about 280,000 tons of food waste a year through donation, compost, and anaerobic digestion. However, that still leaves approximately 80% of organic waste that we then must pay to dispose of. Massachusetts should set the reasonable and achievable goal of 100% organic waste diversion by 2030.

We thank you again for the opportunity to comment on this plan, and we implore you to act aggressively in reducing non-energy emissions from incineration and high heat facilities.

Sincerely,



Michelle Ciccolo  
House Co-Chair  
Zero Waste Caucus



Jason Lewis  
Senate Co-Chair  
Zero Waste Caucus



March 22, 2021

Executive Office of Energy and Environmental Affairs

**Re: NRDC Comments in Support of CECP's Strategy to Adopt California's Emission Standards**

My name is Shelby Parks, and I am a fellow with the Natural Resources Defense Council. Thank you to the Executive Office of Energy and Environmental Affairs for taking comments on the Massachusetts Clean Energy and Climate Plan (CECP).

We strongly support the medium- and heavy-duty clean vehicle T2 Strategy Actions in the CECP, specifically adopting California's Advanced Clean Trucks (ACT) rule by Dec. 31, 2021 and the Advanced Clean Fleets (ACF) rule the year it is finalized by California. However, the CECP should include adopting California's Heavy-Duty Omnibus (HDO) rule, a vital complement to the ACT rule, by Dec. 31, 2021. Adopting California's medium- and heavy-duty vehicle emission standards is imperative for Massachusetts to reduce greenhouse gas emissions and toxic criteria pollutants from transportation.

While the ACT rule ensures a minimum supply of zero-emission vehicles (ZEVs), the HDO rule tightens nitrogen oxide (NOx) and particulate matter (PM) emission standards on new fossil fuel trucks that will continue to be sold. Curtailing NOx, an ozone precursor, and PM—two toxic air pollutants—is essential for public health. According to the American Lung Association, millions of people in Massachusetts are at risk from poor air quality, resulting in significant public health costs associated with increased rates of cardiovascular and respiratory diseases. Worse, transportation pollution is overwhelmingly concentrated in the state's low-income neighborhoods and communities of color.<sup>1</sup> Deployment of zero-emission trucks and buses, along with targeted policies such as the ACF rule, will improve air quality specifically in these communities and ensure that *all* residents have access to clean transportation.

Committing to the ACT and HDO rules in 2021 and the ACF rule once finalized in California, will send a clear market signal that stimulates infrastructure investments, supports clean energy jobs, increase ZEV availability, and enable fleet savings from reduced fuel and maintenance costs.

Many of Massachusetts' neighbors and fellow signatories on the Medium- and Heavy-Duty ZEV Memorandum of Understanding are taking steps to adopt both the ACT and HDO rules in 2021. Massachusetts should do the same and continue its strong regional and national leadership to clean up transportation pollution. The ACT and HDO rules will bring significant environmental, economic, and public health benefits to the state.

As an appendix, I included an 86-group sign-on letter urging states to adopt the ACT and HDO rules. Thank you for the opportunity to provide these comments, and we look forward to continuing to work with you to clean up transportation pollution.

Sincerely,

Shelby Parks

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<sup>1</sup> Union of Concerned Scientists, Inequitable Exposure to Air Pollution from Vehicles in Massachusetts, June 2019, <https://www.ucsusa.org/sites/default/files/attach/2019/06/Inequitable-Exposure-to-Vehicle-Pollution-MA.pdf>



**Appendix: 86-Group Sign-On Letter Supporting States Adopting California’s Advanced Clean Truck Rule and Heavy-Duty Omnibus Rule**





February 25, 2021

Northeast States for Coordinated Air Use Management  
 89 South Street, Suite 602  
 Boston, MA 02111

To Whom It May Concern,

The undersigned organizations continue to be encouraged by the forward progress made by entities participating in the Multi-State Zero-Emission Truck and Bus initiative organized by the Northeast States for Coordinated Air Use Management (NESCAUM) in advancing zero-emission trucks and buses. It is inarguable that a suite of policies is necessary to transition to zero-emission trucks and buses on a timeline commensurate with the public health and climate impacts caused by transportation and in a way that maximizes benefits to the environment, the grid, and to communities most impacted by pollution while minimizing cost. However, this letter focuses on the importance of adopting standards passed by California in 2020 to increase the availability of zero-emission trucks and reduce emissions from combustion trucks. By including the Advanced Clean Trucks (ACT) rule and the Heavy-Duty Omnibus (HDO) rule in the model action plan, NESCAUM can help ensure that states are demonstrating strong commitments to achieving a zero-emission transportation sector. State leadership on these issues is critical – especially in the absence of protective national standards. These programs are needed to protect public health and the

environment, help mitigate climate change, and stimulate the economy. The Biden Administration also has the opportunity to adopt federal standards that help secure substantial emission reductions. We offer these comments with that context in mind.

We believe a suite of policies is necessary to achieve the goals set by the 15 states and Washington, DC in their Memorandum of Understanding (MOU). The ACT rule and the HDO rule are foundational policies that can be complemented with a range of policies to realize a wide-scale transition to zero-emission vehicles. Measures such as a fleet rule, incentives to defray or help finance the relative higher purchase price of zero-emission trucks and buses, and assistance with the cost and deployment of infrastructure will be needed. This is not a task solely for one agency or department – true change requires an “all hands on deck” approach that includes utility commissions, relevant transportation and environmental agencies, utilities, private companies, and others. The following comments address misconceptions and frequently asked questions about the ACT and HDO rules that have come to our attention in recent weeks.

**The transition to zero-emission vehicles must reflect the urgency of the health crisis caused by transportation pollution.**

Despite making up only around 10 percent of the nation’s vehicles, heavy-duty vehicles (HDVs) are responsible for 28 percent of climate change-causing emissions from the transportation sector, as well as 45 percent of on-road nitrogen oxide (NOx) emissions, and 57 percent of on-road, direct fine particulate matter (PM<sub>2.5</sub>) emissions.<sup>2</sup> Forty percent of NOx pollution is from the transportation sector.<sup>3</sup> NOx contributes to ozone and the formation of secondary particulate matter (PM), which, along with primary PM emissions (elemental black carbon), are associated with an increased risk of premature deaths, hospitalization, and emergency room visits. Numerous respiratory and cardiovascular diseases are linked to these pollutants, such as asthma, decreased lung function, heart attacks, and lung cancer.<sup>4</sup>

Reducing NOx and PM emissions is vital for improving public health and meeting the federal National Ambient Air Quality Standards for ozone and PM<sub>2.5</sub>. Cleaning up HDV emissions is long overdue for the communities living adjacent to highways, ports, and freight hubs that disproportionately suffer from harmful air pollution. The communities most burdened by this pollution are predominantly communities of color and low-income communities.<sup>5</sup> A report by the Union of Concerned Scientists confirms this across the country, stating that Asian Americans, African Americans, and Latinos are exposed to 34 percent, 24 percent, and 23 percent more PM<sub>2.5</sub> pollution (respectively) from cars, trucks, and buses than the national average.”<sup>6</sup>

To put a finer point on it, allowing transportation and freight to continue with the status quo will have a detrimental impact on health in communities, particularly those in close proximity to highways and other major sources of transportation pollution. Indeed, a new study estimates that more than 20,000 people die prematurely every year as a result of the health burden from motor vehicle pollution on our roads,

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<sup>2</sup> Union of Concerned Scientists, *Ready for Work: Now is the Time for Heavy-Duty Electric Vehicles* (Dec. 2019) at 2, <https://www.ucsusa.org/sites/default/files/2019-12/ReadyforWorkFullReport.pdf>.

<sup>3</sup> ChargeEVC, *Full Market Vehicle Electrification in New Jersey* (Oct., 2020), <http://www.chargevc.org/wp-content/uploads/2020/10/ChargeEVC-Full-Market-Electrification-Study-FINAL-Oct-7-2020.pdf>

<sup>4</sup> American Lung Association, *Health Effects of Ozone and Particle Pollution*, <http://www.stateoftheair.org/health-risks>.

<sup>5</sup> Union of Concerned Scientists, *Factsheet: Inequitable Exposure to Air Pollution from Vehicles in the Northeast and Mid-Atlantic*, <https://www.ucsusa.org/sites/default/files/attach/2019/06/Inequitable-Exposure-to-Vehicle-Pollution-Northeast-Mid-Atlantic-Region.pdf>.

<sup>6</sup> Union of Concerned Scientists, *Ready for Work: Now is the Time for Heavy-Duty Electric Vehicles* (Dec. 2019) at 2, <https://www.ucsusa.org/sites/default/files/2019-12/ReadyforWorkFullReport.pdf>.

demonstrating the severity of this sector on human health.<sup>7</sup> States must act now to mitigate these vehicles' impact and ensure that environmental justice communities are prioritized and equipped to take part in infrastructure and vehicle deployment programs.

Allowing transportation and freight emissions to continue “business-as-usual” will also delay critical reductions in greenhouse gas (GHG) pollution, causing greater GHG buildup in the atmosphere over time and exacerbating the impacts of climate change. Acting urgently to curb transportation emissions will set us on course for the steep and persistent reduction pathway necessary to avoid the worst effects of climate change.

**The ACT and HDO rules are foundational policies to transition medium- and heavy-duty fleets to zero-emission technology.**

Thanks to improving economics and forward-looking policies, the medium- and heavy-duty vehicle (MHDV) sector is heading towards a zero-emission future. However, additional action is needed to accelerate this transition and maximize benefits. One of the most effective actions states can take to jumpstart the zero-emission MHDV market would be to adopt relevant manufacturing and emission standards, including the ACT and HDO rules. The ACT rule will ensure more zero-emission MHDVs are available for sale, while the HDO rule will reduce emissions from new fossil fuel MHDVs that continue to be sold. The rules work in tandem and, if adopted together, would come into effect simultaneously. They send a clear market signal around which industry, government, and other stakeholders can plan and mobilize investments. These rules were extensively researched and developed by California and follow all federal Clean Air Act requirements for adoption. States may quickly start the regulatory and/or legislative process to adopt these rules under the Section 177 provision of the Clean Air Act and begin enforcement for vehicle model year (MY) 2025 (calendar year 2024), contingent on California receiving a federal waiver from the U.S. Environmental Protection Agency (EPA) under the Clean Air Act for each rule.

**Today, on a total cost of ownership basis and without incentives, certain zero-emission trucks are cost-competitive if not less expensive than their fossil fuel equivalents. Most classes of vehicles are expected to achieve total cost of ownership parity by 2030.**

Although electric truck purchase prices are rapidly declining, they remain higher than most comparable diesel trucks. However, electric trucks are attractive on a total cost of ownership (TCO) basis due to fuel cost savings from charging with potentially less expensive electricity and anticipated 50 percent lower maintenance costs than a comparable diesel or gasoline vehicle.<sup>8</sup> In many cases, these savings will compensate for higher up-front vehicle costs. It is important to remember that upfront vehicle costs will continue to fall as battery prices decline. According to Bloomberg New Energy Finance, battery costs have decreased by 89 percent over the past ten years and continue to drop.<sup>9</sup> Additionally, electric trucks' residual values are expected to be higher than used diesel trucks because a purchaser will receive a more reliable truck with much lower fuel and maintenance costs.<sup>10</sup> Meanwhile, financial institutions are exploring ways

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<sup>7</sup> Environmental Defense Fund, *Accelerating to 100% Clean: Zero Emitting Vehicles Saves Lives, Advance Justice, Create Jobs* (Aug. 27, 2020) at 2, <https://www.edf.org/sites/default/files/documents/TransportationWhitePaper.pdf>.

<sup>8</sup> Andrew Burke and Anisha Kumar Sinha, *Technology, Sustainability, and Marketing of Battery Electric and Hydrogen Fuel Cell Medium- Duty and Heavy-Duty Trucks and Buses in 2020-2040* (2020), UC Davis Institute of Transportation Studies, available at [https://escholarship.org/uc/item/7s25d8bc#article\\_main](https://escholarship.org/uc/item/7s25d8bc#article_main).

<sup>9</sup> BNEF, *Battery Pack Prices Cited Below \$100/kWh for the First Time in 2020, While Market Average Sits at \$137 kWh* (Dec. 16, 2020), <https://about.bnef.com/blog/battery-pack-prices-cited-below-100-kwh-for-the-first-time-in-2020-while-market-average-sits-at-137-kwh/>.

<sup>10</sup> Oberon Insights, *Electric Trucks should have better residual values than diesel*, <https://www.oberoninsights.com/insights/residual-value>.

to pull forward expected fuel and maintenance savings to reduce electric MHDV purchase prices further.<sup>11</sup> The same downward price trend seen in trucks also holds true for buses.

Zero-emission trucks and buses are quickly becoming available across every size and duty cycle. In the North American market, more than 100 zero-emission truck and bus models are either already available or coming to market by 2022, ranging from shuttle buses and cargo vans to school buses and tractor-trailers (Figure 1 and Figure 2).<sup>12</sup> Rapid technological progress is unlocking electrification of even the most demanding duty cycles. Daimler, Paccar, and Volvo, who collectively account for nearly 90 percent of the Class 7-8 truck market, are all actively testing zero-emission Class 8 tractors and have announced plans to bring them to series production over the next 1-2 years.<sup>13</sup> In addition, several other legacy and zero-emission vehicle manufacturers are currently developing prototypes and first-generation commercial products, including hydrogen fuel cell vehicles for long-haul operations.

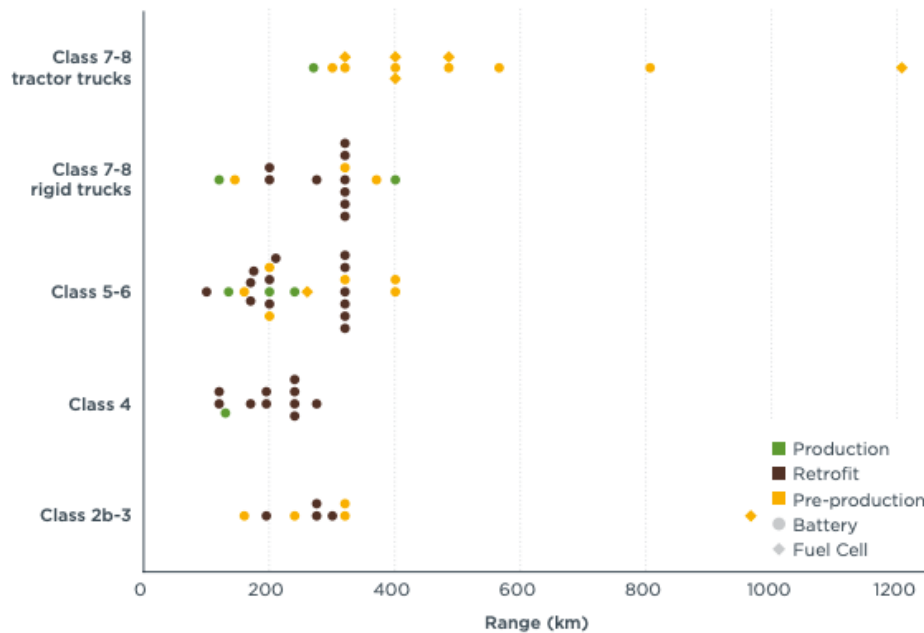


Figure 1. Available and Announced Zero Emissions Truck Models in the U.S. and Canada<sup>14</sup>

<sup>11</sup> Sebastian Blanco, *Proterra Ready for Electric Bus Battery Leasing with \$200-Million Credit Facility*, Forbes (Apr. 18, 2019), <https://www.forbes.com/sites/sebastianblanco/2019/04/18/proterra-ready-for-electric-bus-battery-leasing-with-200-million-credit-facility/?sh=4f2a81ae2314>.

<sup>12</sup> Ben Sharpe, et al., *Race to Zero - How manufacturers are positioned for zero emission commercial trucks and buses in North America*, International Council on Clean Transportation and Environmental Defense Fund (Oct. 2020), Appendix E, [https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT\\_EDF\\_PQ-FINAL.pdf](https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT_EDF_PQ-FINAL.pdf).

<sup>13</sup> Daimler, *Freightliner eCascadia*, [https://freightliner.com/trucks/ecascadia/?gclid=Cj0KCOiAk53-BRD0ARIsAJuNhpvaY5r5sdujZrtV0MVK CZW1b7S45zOAePmr-OXhBQpd8evPgZOW5MkaArDzEALw\\_wcB](https://freightliner.com/trucks/ecascadia/?gclid=Cj0KCOiAk53-BRD0ARIsAJuNhpvaY5r5sdujZrtV0MVK CZW1b7S45zOAePmr-OXhBQpd8evPgZOW5MkaArDzEALw_wcB); Paccar, *Kenworth T680E and Peterbilt 579EV*, <https://www.kenworth.com/news/news-releases/2020/october/t680e/> and <https://www.peterbilt.com/electric-vehicles>, Volvo, *Volvo VNR Electric Truck to Hit the Market Dec.3*, <https://www.truckinginfo.com/10129692/volvo-vnr-electric-truck-to-hit-the-market-dec-3>.

<sup>14</sup> Ben Sharpe, et al., *Race to Zero - How manufacturers are positioned for zero emission commercial trucks and buses in North America*, International Council on Clean Transportation and Environmental Defense Fund (Oct. 2020), Figure 7, [https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT\\_EDF\\_PQ-FINAL.pdf](https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT_EDF_PQ-FINAL.pdf).

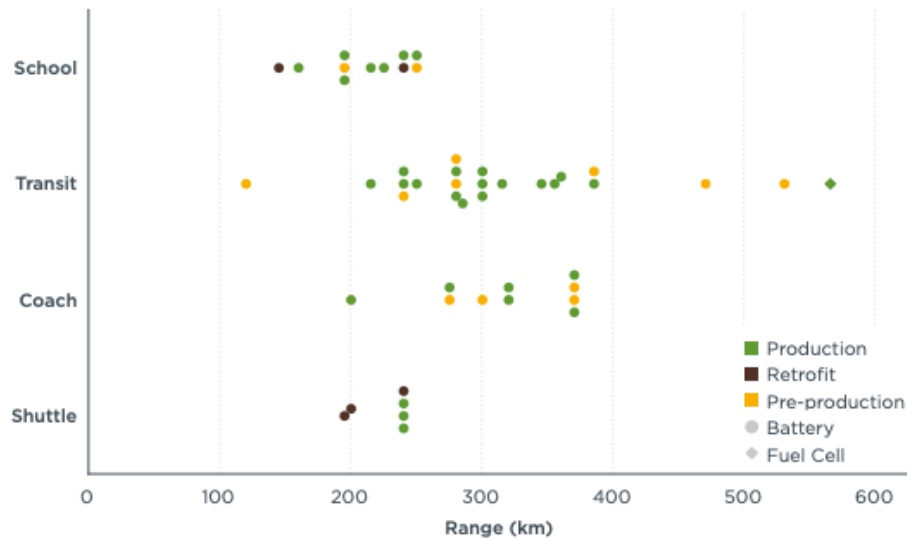


Figure 2. Available and Announced Zero Emissions Bus Models in the U.S. and Canada<sup>15</sup>

Although the upfront cost of zero-emission trucks and buses still exceeds that of their diesel counterparts and requires mitigation, cost parity over the total cost of ownership will be achieved well before the MOU’s currently proposed 2050 timeframe. Medium-duty trucks (Class 3-6) are already cost-competitive over the TCO, and heavy-duty short-haul vehicles (Class 7-8) are expected to achieve TCO parity with diesel-powered vehicles by 2025, without incentives.<sup>16</sup> Heavy-duty long-haul vehicles (likely powered by hydrogen fuel cells) are expected to demonstrate TCO parity without incentives by around 2030.<sup>17</sup> As component costs continue to decline, the business case for zero-emissions vehicles will only strengthen leading up to 2040.

Fleet owners and operators are banding together in groups such as the Corporate Electric Vehicle Alliance (CEVA) to loosely aggregate and signal strong demand for more diverse zero-emission MHDV model options.<sup>18</sup> As discussed above, model availability continues to grow, and regulations like the ACT rule can further enhance that availability.

The ACT rule will soon be accompanied by purchase requirements that will further stimulate participating states’ zero-emission truck market. California plans to finalize an aggressive fleet purchase requirement by 2022, which other states can and should consider adopting. Adopting the ACT rule will act as an accelerator to increase the supply of electric trucks, achieve economies of scale from higher production volumes, lower costs, and encourage solutions to increase demand and possibly result in significant savings.<sup>19</sup>

<sup>15</sup> *Id.* at Figure 8.

<sup>16</sup> North American Council for Freight Efficiency, *Electric Trucks: Where They Make Sense* (May 2019) at 13-14, <https://nacfe.org/emerging-technology/electric-trucks/>.

<sup>17</sup> ICF, *Comparison of Medium- and Heavy-Duty Technologies in California – Executive Summary* (Dec. 2019) at 4, [https://www.caletc.com/assets/files/ICF-Truck-Report\\_Final\\_December-2019.pdf](https://www.caletc.com/assets/files/ICF-Truck-Report_Final_December-2019.pdf).

<sup>18</sup> Ceres, *Corporate Electric Vehicle Alliance*, <https://www.ceres.org/our-work/transportation/corporate-electric-vehicle-alliance>.

<sup>19</sup> Chris Busch, et. al., *Clean Trucks, Big Bucks: California Energy Policy Simulator evaluation of the proposed Advanced Clean Trucks Rule*, Energy Innovation and Environmental Defense Fund (Jun. 2020), [https://energyinnovation.org/wp-content/uploads/2020/06/Clean-Trucks-Big-Bucks\\_June\\_17\\_2020.pdf](https://energyinnovation.org/wp-content/uploads/2020/06/Clean-Trucks-Big-Bucks_June_17_2020.pdf)

## **Deploying electric truck infrastructure is technically and economically feasible and offers a host of potential benefits.**

Meeting the electric infrastructure needs to support the deployment of MHD battery electric vehicles (BEVs) is technically feasible – that is, the ability to integrate BEVs into the grid already exists. The expected generation and capacity needs for BEVs over the next half-century are below historical annual growth rates.<sup>20</sup> For example, there have been periods of rapid electric demand growth in the US associated with home electrification and the addition of household appliances (1970-75) and with the widespread adoption of air conditioning (1990-95). These years saw annual generation increases equal to the needs of tens of millions of BEVs.<sup>21</sup> While the increased load from MHD BEVs will more than likely require additional investment in grid infrastructure, utilities can and should plan to mitigate the need for expensive build-out of grid infrastructure through non-wires solutions, such as on-site generation and storage, and ensure new load is integrated to avoid exacerbating peak demand. MHD BEVs' challenge is not feasibility and could in fact lower consumer electricity prices by increasing grid utilization.

There are many potential benefits to developing a robust electric charging network for MHD BEVs. For example, due to the large battery size and, in some cases, predictable operation schedules, MHD BEVs may be prime candidates for vehicle-to-grid applications. Vehicle-to-grid technologies can improve grid stability and reliability, help integrate more renewable energy, and in some applications, possibly offer additional revenue streams to BEV owners. Another advantage to the infrastructure build-out is high-quality job creation.<sup>22</sup>

In 2019, over a quarter-million Americans were employed in the clean vehicle industry.<sup>23</sup> To date, over \$300 billion in global private investments have flowed into electric vehicles.<sup>24</sup> Moreover, thanks to the lower cost of filling up with electricity rather than fossil fuels and lower maintenance costs, electric vehicles save fleets and consumers money. These savings are largely redirected towards local services—the most labor-intensive and skill-diverse sector of the economy—and are less likely to be outsourced.<sup>25</sup> Shrinking and shifting expenditures from diesel and gasoline to the labor-intensive service industry will serve as a potent job creator and economic stimulant. Of course, protections must be included to prevent exploitative practices and ensure new jobs are equitably distributed. Moreover, there is a need for zero-emission workforce training and development programs that prioritize displaced workers, residents of pollution-burdened communities, communities facing barriers to employment, low-income communities, and communities of color.

## **The ACT and HDO rules are built around flexibility and designed for an evolving market with segments in different electrification suitability stages.**

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<sup>20</sup> US DRIVE, *Summary Report on EVs at Scale and the U.S. Electric Power System*, <https://www.energy.gov/sites/prod/files/2019/12/f69/GITT%20ISATT%20EVs%20at%20Scale%20Grid%20Summary%20Report%20FINAL%20Nov2019.pdf>.

<sup>21</sup> *Id.* at 3

<sup>22</sup> E2, ACORE, CELI, bw Research Partnership, *Clean Jobs, Better Jobs: An examination of clean energy job wages and benefits* (Oct. 2020), <https://e2.org/wp-content/uploads/2020/10/Clean-Jobs-Better-Jobs.-October-2020.-E2-ACORE-CELI.pdf>.

<sup>23</sup> E2, *Clean Jobs America 2020: Repowering America's Economy in the Wake of COVID-19* (Apr. 2020), <https://e2.org/reports/clean-jobs-america-2020/>.

<sup>24</sup> Paul Lienert and Christine Chan, *Charged: A Reuters analysis of 29 global automakers found that they are investing at least \$300 billion in electric vehicles, with more than 45 percent of that earmarked for China* (Jan. 20, 2019), Reuters, <https://graphics.reuters.com/AUTOS-INVESTMENT-ELECTRIC/010081ZB3HD/index.html>.

<sup>25</sup> David Roland-Holst, et al. *Exploring Economic Impacts in Long-Term California Energy Scenarios* (June 2018), Consultant Report for the California Energy Commission, <https://ww2.energy.ca.gov/2018publications/CEC-500-2018-013/CEC-500-2018-013.pdf>.

The ACT rule starts with low sales requirements and gradually increases, leaving time for technology to improve, the supporting ecosystem to mature, and vehicle prices to decline. The ramp-up in sales requirements is modest: from adopting the rule in 2021 to the second year of compliance in calendar year 2025, the sales requirement only grows to 10-13% of sales. We can expect significant advancements in range and efficiency in the intervening years, expanding suitability for a wider spectrum of zero-emission vehicle uses and classes. The HDO rule follows a comparable transition with stronger emission standards beginning in MY 2024 and then tightening further in MY 2027.

While unique use cases that are harder to electrify, such as snowplows, may persist, large percentages of each state's truck fleet will be suitable for a transition to zero-emission vehicles over the rules' lifetime, and these exceptions should not dictate the rule. Further, both the ACT and HDO rules employ credit mechanism systems that incentivize voluntary early action and permit a high degree of compliance flexibility. For example, the ACT rule allows zero-emission credit trading between manufacturers and between most truck classes, accounting for vehicle size, enabling manufacturers to shift credits from truck segments ripe for electrification to those that are less suitable. However, states must adopt complementary measures that explicitly prioritize frontline communities to ensure that those most burdened by harmful air pollution are not further negatively impacted and experience disproportionate pollution reduction benefits.

The ACT rule can accommodate potential fluctuations in vehicle sales from year-to-year. The rule does this by basing manufacturers' ZEV credit requirements on average truck sales data from the previous three years. In that way, peaks or troughs in purchases due to economic or regulatory forces are smoothed and have minimal impact on the overall trajectory of ZEV sales.

**The HDO rule is a vital complement to the ACT rule with substantial public health and environmental benefits.**

The HDO rule makes much-needed reforms, such as strengthening NO<sub>x</sub> and PM emission standards for new fossil fuel trucks, introducing a new NO<sub>x</sub> standard for a low-load certification cycle, extending manufacturer warranties, and improving in-use testing to better align with actual operations and global standards. Moreover, the proposed emission standards derive from nearly a decade of rigorous research and analysis demonstrating that the new requirements are not only technically feasible but cost-effective methods of emissions reduction.

The HDO rule is expected to cut NO<sub>x</sub> emissions from HDVs by 75 percent below current standards beginning in 2024 and 90 percent in 2027.<sup>26</sup> In addition to cleaning up NO<sub>x</sub>, the proposed rule looks to institutionalize PM pollution controls and prevent backsliding by adopting a more stringent standard that aligns with current industry certifications. These reductions in California are projected to amount to \$36 billion in statewide health benefits from 3,900 avoided premature deaths and 3,150 hospitalizations from 2022 to 2050.

While the ACT rule works year-over-year to gradually increase the share of new truck sales that are zero-emission, the HDO rule curtails toxic air pollution from new diesel vehicles that will continue to be sold in the interim. The ACT and HDO rules are two sides of the same coin: together, they collectively

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<sup>26</sup> California Air Resources Board, *Facts about the Low NO<sub>x</sub> Heavy-Duty Omnibus Regulation*, [https://ww2.arb.ca.gov/sites/default/files/classic/msprog/hdlownox/files/HD\\_NOx\\_Omnibus\\_Fact\\_Sheet.pdf](https://ww2.arb.ca.gov/sites/default/files/classic/msprog/hdlownox/files/HD_NOx_Omnibus_Fact_Sheet.pdf).



enable a state's long-term vision of a zero-emission MHDV fleet and address toxic transportation pollution in the near-term.

**Seven years of research and analysis informed the HDO rule to ensure it is technically feasible, cost-effective, and adheres to all legal requirements.**

When developing the HDO rule, the California Air Resources Board (CARB) thoroughly evaluated the technical feasibility of the rule's emission standards in partnership with the Southwest Research Institute (SwRI), Manufacturers of Emission Controls Association, U.S. EPA, South Coast Air Quality Management District, and engine manufacturers. The testing convincingly demonstrated and modeled cost-effective solutions to meet both 2024 and 2027 standards.<sup>27</sup> Importantly, certification data shows that many manufacturers today certify well below current standards and nearly meet the 2024 requirements.<sup>28</sup> Moreover, several engine manufacturers have already committed to developing compliant MY 2024 engines and are actively making plans to meet the MY 2027 requirements.<sup>29</sup>

CARB staff has demonstrated the technical feasibility of both the 2024 and 2027 proposed NO<sub>x</sub> standards through several years of extensive development and testing in partnership with SwRI.<sup>30</sup> The development and testing, together with related work by manufacturers, show that the proposed 2024 standards can be met using a combination of improved engine calibration, the newest configuration of after-treatment devices and urea injection. The 0.02 g/bhp-hr NO<sub>x</sub> standard proposed for MY 2027 and subsequent years can be achieved by further refinements to the aftertreatment plus well-established powertrain technologies including cylinder deactivation – a technology widely used in passenger vehicles.<sup>31</sup> Moreover, recent opposed-piston engine testing were able to reduce NO<sub>x</sub> emissions below the MY 2027 requirement in a Peterbilt tractor using conventional downstream aftertreatment equipment.<sup>32</sup> A cost assessment showed that opposed-piston engines “cost 11 percent less than conventional engines of the same power and torque” with substantially less NO<sub>x</sub> and CO<sub>2</sub> emissions.<sup>33</sup>

It should be noted that the timeline set out by the current iteration of the low NO<sub>x</sub> rule does not present undue constraints. The NO<sub>x</sub> standards preceding the recent HDO rule, which largely mirrored the EPA standards, were some of the most technology-forcing emissions standards ever adopted – requiring the development of an entirely new catalyst, new particulate filters, and a system that had to track the amount of NO<sub>x</sub> in the tailpipe, an amount that varies greatly under different driving conditions and integration of an advanced and complex engine exhaust gas recirculation system. Those new technological elements all had to work in concert without significantly impacting fuel consumption. Despite these challenges, manufacturers were readily able to meet these standards in a timely manner. In contrast,

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<sup>27</sup> California Air Resources Board, *Technological Feasibility of Proposed Standards*, <https://ww3.arb.ca.gov/regact/2020/hdomnibuslowNOx/appi.pdf>.

<sup>28</sup> California Air Resources Board, *Public Hearing to Consider the Proposed Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments, Staff Report - Initial Statement of Reasons*, <https://ww3.arb.ca.gov/regact/2020/hdomnibuslownox/isor.pdf>

<sup>29</sup> California Air Resources Board, *Responses to Comments on the Environmental Analysis for THE PROPOSED HEAVY-DUTY ENGINE AND VEHICLE OMNIBUS REGULATION AND ASSOCIATED AMENDMENTS*, <https://ww3.arb.ca.gov/regact/2020/hdomnibuslowNOx/res20-23attbrtc.pdf>.

<sup>30</sup> *Id.* at ES-12.

<sup>31</sup> *Id.* at III-12 to III-27.

<sup>32</sup> Achates Power, *Achates Power Opposed-Piston Heavy-Duty Diesel Engine Demonstration Performance Results – Ultralow NOx without additional hardware*, <https://achatespower.com/wp-content/uploads/2020/12/Achates-Power-Opposed-Piston-Heavy-Duty-Diesel-Engine-Demonstration-Performance-Results-Ultralow-NOx-without-additional-hardware.pdf>

<sup>33</sup> *Id.* at 2.

“meeting the envisioned CARB 2024 targets would require very modest increases in technology complexity and costs.”<sup>34</sup> Thus, compliance can reasonably be achieved on the timeline set forth by CARB.

Per CARB’s extensive economic analysis, the cost in California to manufacturers of complying with the rule is \$4.07 billion from 2022 through 2050. These costs are dwarfed by the rule’s \$36.8 billion in expected public health benefits for Californians over the same period – the significance of which should not be given short shrift in other states that pass analogous rules. And, manufacturers can expect to pass on costs through higher prices. However, buyers are not without benefits: the HDO rule would lengthen manufacturer emission warranty periods, effectively eliminating repair costs to vehicle owners during that extended period. Also, the HDO’s longer useful life and durability requirements would encourage manufacturers to produce more durable components, resulting in fewer failures and less downtime for vehicle owners. As a percent of baseline purchase prices, price increases are minimal and expected to range from 0.4 to 9.5 percent, with an average of 2.6 percent in MY 2024 to 2026, 5.2 percent in MY 2027 to 2030, and 5.8 percent in MY 2031 and beyond. Consequently, the HDO rule’s cost-effectiveness is \$5.45 per pound of NOx reduced – well within the range of previously adopted emission regulations.

**The ACT and HDO rules will not prompt manufacturers to exit participating markets, and fears of a pre-buy/no buy scenario are unwarranted.**

The trend towards zero-emission MHDVs and the sharp curtailment of diesel emissions is global and durable. In many ways, the HDO rule is an opportunity to catch up with European regulators, while the ACT rule is a way to continue maintaining American manufacturing competitiveness relative to China. And, while the trend is global, so too are the truck manufacturers. The notion that multinational (and even multi-state) OEMs will abandon markets rather than invest and innovate is counterintuitive based on their stated intent.<sup>35</sup> For example, at the end of 2020, the European Automobile Manufacturers’ Association, which includes major truck manufacturers such as Daimler, Volvo, Scania, CNH, MAN, DAF, and Ford, committed to only sell zero-emission trucks by 2040.<sup>36</sup> Also, as previously mentioned, several manufacturers are already close to meeting the initial HDO rule emission standards and have committed to developing compliant engines.

Analysis performed by EDF clearly shows that there are significant benefits inherent in more stringent standards.<sup>37</sup> When reviewing market growth in response to 2007 and 2010 federal engine standards, there was smooth growth in vehicle demand prior to, and during implementation of the 2014 Phase 1 fuel efficiency and emissions standards. Indeed, the purchase of MY 2014 vehicles was *higher* than any year since 2005.<sup>38</sup> This demonstrates that strict standards do not lead to dampened adoption of cleaner vehicles; as well, these standards can lead to fuel cost savings, an important component of making the economic case for the transition.

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<sup>34</sup> International Council on Clean Transportation, *Estimated cost of diesel emissions-control technology to meet the future California low NOx standards in 2024 and 2027* (May 20, 2020), <https://theicct.org/publications/cost-emissions-control-ca-standards>.

<sup>35</sup> Volvo Trucks, *The Future of Electric Trucks*, <https://www.volvotrucks.us/innovation/electromobility/>.

<sup>36</sup> European Automobile Manufacturers’ Association, *Joint Statement: The Transition To Zero-Emission Road Freight Transport*, <https://www.acea.be/uploads/publications/acea-pik-joint-statement-the-transition-to-zero-emission-road-freight-trans.pdf>

<sup>37</sup> Katherine Rittenhouse and Matthew Zaragoza-Watkins, *Strategic Response to Environmental Regulation: Evidence from U.S. Heavy-Duty Vehicle Air Pollution Regulations*, MIT CEEPR Working Paper, (2016).

<sup>38</sup> Heavy Duty Trucking, *Healthy Demand Overall for Trucks in September*, Heavy Duty Trucking (Oct. 3, 2014), <http://www.truckinginfo.com/channel/fleet-management/news/story/2014/10/healthy-demand-overall-for-trucks-in-september.aspx?ref=rel-recommended>.

It should also be noted that “the pre-buy in response to 2007 criteria pollutant standards [was found] to be approximately symmetric, short-lived, and small in volume relative to previous estimates”<sup>39</sup> – indicating that fears of mass purchase of more polluting vehicles before implementation of a standard may not come to fruition. The bottom line is that, rather than seeing fleets buy dirtier, ostensibly cheaper vehicles in a panic, there is clear evidence that no meaningful adjustment in market purchasing occurs as a result of these standards – fleets recognize the cost savings over time of cleaner vehicles and do not seem inclined to ignore those benefits to reap the marginally lower purchase price of more polluting vehicles while they still can.

**Future national low-NOx or ZEV truck standards are uncertain, and communities need emission reductions today.**

Toxic air pollution from fossil fuel MHDVs is an urgent public health emergency. Although the federal EPA launched a Cleaner Trucks Initiative in 2018 to reduce NOx emissions from HDVs, the rulemaking is in its infancy and was delayed indefinitely in 2020. Due to federal lead-time requirements and other rulemakings at EPA, it is doubtful a national low-NOx standard could take effect before MY 2027. At a minimum, this would create a gap of several years between the HDO rule schedule and federal implementation, delaying critical reductions in toxic air pollution and greenhouse gas emissions. Notably, federal and state action is not mutually exclusive and is, in fact, complementary. States should adopt the more robust ACT and HDO rules in line with Section 177 requirements under the federal Clean Air Act while also advocating for a strong national standard. In this way, MOU states can take concrete action today to address toxic air pollution from vehicles registered in-state while getting a new national standard to clean up out-of-state trucks that travel across state lines. Adopting ambitious state rules will go a long way to ensuring near-term air quality improvements for all residents and accelerating the transition to a cleaner transportation future.

**Conclusion**

States should adopt the ACT and HDO rules, bolstering the zero-emission MHDV market and easing the long-term transition to a clean transportation sector. Fundamentally, these regulations are feasible, economical, and represent a timely means of achieving necessary reductions in air pollution and GHG emissions. These programs’ importance should be highlighted in the model action plan developed by the states and facilitated by NESCAUM.

Sincerely,

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<sup>39</sup> Katherine Rittenhouse and Matthew Zaragoza-Watkins, *Strategic Response to Environmental Regulation: Evidence from U.S. Heavy-Duty Vehicle Air Pollution Regulations* at 33, MIT CEEPR Working Paper, (2016).

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**FCHEA Comments on the Massachusetts Interim Clean Energy and Climate Plan for 2030**  
March 22, 2021

The Fuel Cell and Hydrogen Energy Association (FCHEA) appreciates the opportunity to provide comments on the Massachusetts Interim Clean Energy and Climate Plan for 2030. FCHEA represents leading companies and organizations that are advancing innovative, clean, safe, and reliable energy technologies. FCHEA's membership includes the full global supply chain of the fuel cell and hydrogen technology landscape.

FCHEA greatly supports the efforts to drive the state towards a path to decarbonization, however, we implore the Executive Office of Energy and Environmental Affairs to recognize the potential that fuel cell and hydrogen technologies have to offer to reduce emissions across a range of sectors including transportation, building heating and electrification, power generation, and other more, all while reinforcing the state's economy.

**Transportation**

FCHEA emphatically supports the drive towards zero-emissions transportation and vehicle electrification, which includes both fuel cell vehicles (FCVs) and battery electric vehicles (BEVs). We recommend that Massachusetts supports for all zero-emissions vehicles (ZEVs) in this plan.

As detailed in the current plan, Massachusetts does not consider FCVs to be electric vehicles (EVs) for the purposes of this document. FCVs are electric vehicles, however rather than storing electricity from the grid in a battery, FCVs combine oxygen from the air with hydrogen fuel to generate electricity on board, with the only tailpipe emission being water vapor. FCVs are the only ZEV platform now, or for the foreseeable future, that replicates today's drivers experience of being able to travel 300-400 miles on a tank of hydrogen fuel and refuel in 3 to 5 minutes.

**FCHEA recommends that fuel cell vehicles be explicitly considered electric vehicles and mentioned as a qualifying technology to ensure their inclusion within the strategies put forth by the Clean Energy and Climate Plan.**

FCV inclusion as an EV is essential for their success. For instance, *Strategy T5: Engage Consumers & Facilitate Markets* repeatedly mentions EVs and includes provisions to fund EV charging infrastructure deployment. FCVs must be considered EV within the document to ensure they are capable of accessing the same funding resources as other technologies.

The California Air Resources Board, the agency charged with oversight of the state's ZEV program, has stated that "successful market launch and continued growth of both FCVs and California's hydrogen fueling network are essential for the State to meet zero-emission vehicle goals set forth in Governor Brown's Executive Order B-16-2012 as well as greenhouse gas (GHG) reduction, air quality improvement, and petroleum reduction goals set forth in state and



federal laws and programs.” To this end, California has provided robust policy, regulatory, and financial support for the deployment of FCVs and related hydrogen refueling infrastructure, as well as for battery vehicles and charging. This policy and regulatory action can be taken as a model for Massachusetts as plans are developed to expand electrified and zero-emission vehicle adoption, especially since Massachusetts joined with other states to follow California’s ZEV program.

As transportation is currently Massachusetts’s largest source of greenhouse gas emissions, it is vital that we advance all zero-emission vehicles and support fueling infrastructure development. There are thousands of zero-emission FCVs being driven by consumers today in California, with automaker plans to expand to new markets in the Northeast in the near-future. By omitting light-duty hydrogen transportation, we are concerned that FCVs could be deemed ineligible for certain grants and other funding efforts in the years ahead. FCVs should be given parity with BEVs to ensure consumers have choices when looking to purchase an electric vehicle and avoid the government effectively picking winners and losers in ZEV transportation.

This separation of technologies is especially exacerbated within the Plan’s *Strategy T4: Deploy Electric Vehicle Supply Equipment & Enable Smart Charging*, which focuses on BEV charging without consideration of other ZEVs such as FCVs. As this strategy is designed to address issues with BEV charging, it should be expanded to provide a comprehensive plan for ZEV refueling infrastructure.

**FCHEA recommends that *Strategy T4* be expanded to address FCV refueling concerns to enable a widespread and accessible hydrogen network across the state.**

Hydrogen is an environmentally friendly fuel, and when used in an FCV, there are no carbon, NO<sub>x</sub>, SO<sub>x</sub>, or particulate matter emissions from the tailpipe. According to the Argonne National Laboratory Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies Model, on a well-to-wheels basis, no matter the source of hydrogen, FCVs dramatically reduce emissions compared to combustion vehicles and are on par with BEVs. When hydrogen is generated from renewable or low-carbon sources – such as wind, solar, biomethane, or natural gas with carbon capture and sequestration – carbon emissions are either completely or nearly eliminated. To enable deep-decarbonization and emission reduction across the entire transportation sector, it is critical that hydrogen and fuel cells are included among policy options.

Beyond light-duty vehicles (LDV), fuel cells are being used in more than 40,000 forklifts, dozens of buses operating in revenue service, and several demonstrations of heavy-duty Class 8 trucks and medium-duty delivery vans. For medium- and heavy-duty applications in particular, fuel cells excel due to their scalability, allowing for decarbonization to advance in a sector where batteries may face difficulties due to weight restrictions and long charging times. Fuel cells in other transportation applications including locomotives, shipping, and aviation are also advancing rapidly and show great promise for decarbonization in these sectors as well. Given these considerations, fuel cells are especially suited to addressing the goals of *Strategy T2: Implement Coordinated Advanced Clean Vehicle Emissions and Sales Standards*. In addition,

development of both heavy-duty and light-duty hydrogen vehicles can build a virtuous cycle, where further deployment of LDV cars and SUVs builds economies of scale for fuel cell stacks and systems to reduce costs, while the HDV sector can significantly drive hydrogen utilization, lowering the costs of stations and fuel. Development of both sectors will be vital to a decarbonized transportation future.

### **Electricity Generation and Energy Supply**

As the Massachusetts Renewable Portfolio Standard includes hydrogen-powered fuel cells<sup>1</sup>, these technologies should be given recognition as a component of the grander Clean Energy and Climate plan.

**FCHEA recommends the inclusion of hydrogen and fuel cell energy technologies among the strategies focused on clean energy resources, namely *Strategy E1: Fill Current Standards & Execute Procurements*, and to develop a new dedicated Strategy that focuses on growing a robust clean hydrogen economy and fuel cell infrastructure across Massachusetts.**

Given their demonstrated ability to provide clean, resilient, and reliable primary and backup power to a long and growing list of public and private sector customers, fuel cell systems should be included in clean energy planning for Massachusetts in support of intermittent renewable resources such as solar and wind. In the United States today, there are more than 550 megawatts (MW) of large-scale fuel cell systems deployed in both behind and front-of-the-meter applications. Many of the world's leading fuel cell manufacturers in this sector are headquartered here in the U.S., with several in the Northeast.

Stationary fuel cells can be deployed in complement with renewable energy resources such as wind and solar and are able to provide distributed, clean primary power to fill needs when renewable power is intermittent. Many fuel cell systems can also be deployed in combined heat and power (CHP) configurations, able to support efforts of producing clean heat for buildings as well. Fuel cells also improve the reliability and stability of an electric grid and can also be configured to operate independently as distributed generation microgrids. In addition, the energy density of fuel cell systems significantly reduces the land footprint required for onsite generation, typically only one acre for ten MW of generation, allowing for operation in high density areas and leaving increased acreage available for habitat restoration and preservation.

Fuel cell systems generate 24/7, clean, load-following power at close to 100% capacity factors. Compared to other front-of-the-meter distributed energy resources, the combination of fuel cell high efficiency and extremely high-capacity factor results in the displacement of more GHG emissions than equivalent-sized intermittent resources. Importantly, this high-capacity factor corresponds to the production of clean, renewable electric energy per unit of power capacity that is on the order of six times that of solar power systems (assuming a 15% capacity factor for

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<sup>1</sup> <https://www.mass.gov/doc/rps-class-i-regulations-clean/download>

solar) and on the order of three times that of wind power systems (assuming a capacity factor of 30% for wind). Thus, investments in fuel cell capacity produce vastly more energy than wind or solar power systems per unit of capacity installed.<sup>2</sup> When this electric energy is produced at times of low renewable energy availability, the fuel cell systems produce much lower GHG emissions per MWh. This translates into substantially more GHG reductions per MW installed.

As large-scale fuel cell systems are primarily fueled by underground gas pipelines, they are a resilient power source, ensuring that vital operations can continue when the grid is offline due to manmade or natural disasters. This need for assured power is key for critical facilities - such as utility substations, hospitals, data centers, office buildings, universities, and logistics centers, - where every minute without power can put lives at risk or cost thousands of dollars. Smaller fuel cell systems are deployed across the country, providing backup power to telecommunications, radio, railroad, first responder, and other critical networks.

## **Energy Storage**

One key factor needed for successful energy independence is finding energy storage solutions for intermittent sources such as solar and wind power, a space in which hydrogen excels. Hydrogen storage uses surplus energy created by renewables during low demand periods to power electrolysis to generate hydrogen from water using an electric current.

### **FCHEA recommends the Clean Energy and Climate plan coordinate hydrogen production with the massive offshore wind power development within *Strategy E5: Develop a Mature Offshore Wind Industry in Massachusetts.***

Producing hydrogen from surplus offshore wind energy has shown great potential in already-existing projects. The OYSTER project, consisting of ITM Power, Ørsted, Siemens, and other energy companies, recently received a €5 million (~\$5.96 million) grant from the European Commission to demonstrate a combined offshore wind turbine and hydrogen electrolyzer system in Denmark.<sup>3</sup> In the United Kingdom, the energy consultancy Environmental Resources Management is heading the Dolphyn project, which seeks to power hydrogen electrolyzers with Scotland's offshore wind. The UK government has supported the project with a £3.12 million (~\$4.32 million) grant.<sup>4</sup> The project has drawn attention from important industries players, such as Doosan and Nel, companies with strong footprints in the Northeast U.S.<sup>5</sup>

Once hydrogen is generated through electrolysis, it can be used in stationary fuel cells for power generation, to provide fuel for fuel cell vehicles, injected into natural gas pipelines to

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<sup>2</sup> University of California, Irvine A 100 Percent Renewable Electric Grid: An assessment produced by the Advanced Power and Energy Program at UC Irvine. March 2018, available at: [http://www.nfrcr.uci.edu/White\\_Papers.html](http://www.nfrcr.uci.edu/White_Papers.html)

<sup>3</sup> <https://www.itm-power.com/news/5m-eu-award-to-study-offshore-green-hydrogen-production-with-orsted-and-siemens-gamesa>

<sup>4</sup> <https://www.erm.com/news/erm-gets-go-ahead-to-develop-green-hydrogen-at-scale-from-offshore-wind/>

<sup>5</sup> <https://www.erm.com/news/nel-and-doosan-join-erms-dolphyn-hydrogen-project-team/>

reduce their carbon intensity, or even stored as a compressed gas, cryogenic liquid or wide variety of loosely-bonded hydride compounds for later use.

A recent report, [The Promise of Seasonal Storage](#), by Norway-consulting firm DVL GL highlights that hydrogen is the first viable option for long-term seasonal storage needs that can help meet electricity demand in a utility grid with a high adoption of renewables<sup>6</sup>. The International Energy Agency (IEA) has also issued a report predicting that hydrogen generated from wind will be cheaper than natural gas by 2030.<sup>7</sup>

### **Heating and Fuel Blending**

Hydrogen fuel should also be taken into consideration to address issues building heating, electrification, and fuel blending. While hydrogen is briefly mentioned in *Strategy B3: Convene the Commission and Task Force on Clean Heat & Cap Heating Fuel Emissions*, hydrogen can play a significant role in this sector.

### **FCHEA recommends hydrogen's heating and fuel blending roles be expanded within Strategies B2 and B3.**

Hydrogen can be blended into the state's existing natural gas infrastructure to aid with decarbonization. Utility companies are capable of taking this approach, as demonstrated in the state of Utah by the recent project from the Intermountain Power Agency's (IPA) Intermountain Power Project (IPP) Renewal Project. IPA plans to retire a coal-fueled power plant and replace it with an 840 MW natural gas combined cycle plant specially designed to accept 30% renewable hydrogen-blended fuel at its projected startup in 2025, with an increase to 100% renewable hydrogen utilization by 2045. The plant offers dual benefits of providing clean electricity and a method of mitigating the infamous duck curve experienced by a high concentration of renewable energy.

Another alternative to gas or oil heating could be to produce combined heating and power and/or combined cooling and power through stationary fuel cell systems. These fuel cell applications high energy efficiency by using waste heat from the fuel cell electricity-generation process to provide building climate control. This system could use hydrogen or natural gas supplied by a pipeline or by off-grid, where households and businesses make their own hydrogen with solar power and electrolysis.

### **Hydrogen and the Economy**

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<sup>6</sup> <https://www.dnvgl.com/publications/the-promise-of-seasonal-storage-168761>

<sup>7</sup> <https://www.iea.org/reports/the-future-of-hydrogen>

In addition to hydrogen's environmental benefits, it has the potential to bolster the economy through the creation of investment opportunities and skilled energy jobs. A recent report by McKinsey and Company, *Road Map to a US Hydrogen Economy*, found that the hydrogen sector has the potential to generate 700,000 jobs and \$140 billion in revenue by 2030<sup>8</sup>. By 2050, that economic impact could grow to 3.4 million jobs, \$750 billion in revenue, while achieving 16% reductions of CO<sub>2</sub> emissions, 36% reduction in NO<sub>x</sub> emissions, and accounting for 14% of U.S. energy demand.

Thank you for your consideration of the full breadth of hydrogen and fuel cell technologies within the Massachusetts Interim Clean Energy and Climate Plan for 2030. Should you have any questions or wish to discuss these comments further, I am available at any time by email at [mmarkowitz@fchea.org](mailto:mmarkowitz@fchea.org) or by phone at (202) 261-1333.

Sincerely,

Morry B. Markowitz  
President  
Fuel Cell and Hydrogen Energy Association

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<sup>8</sup> <http://www.fchea.org/s/Road-Map-to-a-US-Hydrogen-Economy-Full-Report.pdf>

Andrew Ahern: Resident of Worcester, MA 01604  
CECP 2030 Comment  
2/26/21

On page 4 of the CECP, the report states: "In October 2018, following commitments made by the signatories of the 2016 Paris Agreement, the IPCC issued updated guidance: to avoid the damaging and extreme impacts of climate change, global warming must stabilize below 1.5 degrees Celsius, requiring global emissions to be net-zero by mid-century. In recognition of that update in best available climate science and the need to take bold actions to reduce GHG emissions, Governor Charles Baker committed Massachusetts to achieving net-zero emissions by 2050 during his January 2020 State of the Commonwealth Address."

I am happy to see this acknowledgement of the IPCC's warning. However, there is key context missing from what the IPCC Report on 1.5C of Warming tells us that should increase the sense of urgency and scale of the CECP if the Baker Administration is listening to the best available climate science.

[The IPCC](#) tells us we need global greenhouse gas reductions of 45% by 2030 from **2010** levels to achieve a chance of staying within safe levels of 1.5C. This fact is neglected in the CECP. Instead, the plan relies on 1990 levels, which are an insufficient baseline as it relates to the best available climate science. The Global Warming Solutions Act was passed before the IPCC Report on 1.5C. If the Baker Administration is providing updates in recognition of the best available climate science, then the administration needs to use 2010 levels. This is very important, not just because the IPCC says it, but because there [have been more global CO2 emissions since 1990](#) than anytime before. The CECP needs to reflect the best available climate science and the scientists warning.

Further, achieving net-zero by 2050 for a rich state, in a rich nation is insufficient to stay within a safe 1.5C. We need to be exceeding 50% reductions by 2030 from 2010 levels to ensure we don't go over 1.5C. [The pledges already in place by nations are ensuring we go well beyond 2C](#), with National Determined Contributions set to only have 1% emissions reductions by 2030 as of now.

Massachusetts needs to lead on this front. We need to update our plans to reflect the scientific reality, and act aggressively to cut emissions well beyond 50% by 2030 from 2010 levels. Anything else ensures our contribution to a +2C world for my generation and future ones.

Thank you,  
Andrew Ahern

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19 February 2021

**Re: Comments on Interim Clean Energy Climate Plan for 2030 (2030 CECP)**

Dear Secretary Theoharides,

I respectfully submit this response to the Interim Clean Energy Climate Plan for 2030 (“CECP”), issued for comment by your office on December 30, 2020. This response is informed in part by the collaborative work of students taking my recent class, *The Sustainability Response to COVID-19*, offered in connection with MIT’s Independent Activities Period.

The Commonwealth of Massachusetts has set a laudable goal of achieving net zero carbon emissions by 2050. The CECP is designed to inform policies that advance this effort through a 2030 milestone. I applaud the setting of a 2030 interim milestone and urge that it be complemented by a requirement to monitor every two years, which is essential for two reasons.

First, you can effectively determine whether progress is sufficient to actually meet the longer term goal by setting interim milestones. Since the current fleet of vehicles includes only small percentages of EVs, and the vast preponderance of gasoline powered vehicles will continue to circulate, producing greenhouse gases for the remainder of their useable life (which in many cases will likely be another fifteen years or more), it is very important to check the composition of the fleet frequently to be sure that the percentage of gasoline powered vehicles, and the *absolute number* of gasoline powered vehicles is declining at a rapid enough pace to meet the long range goal.

Second, the accumulation of greenhouse gases each year is the problem that must be controlled and reduced as soon as possible, so frequent evaluation of the “state of the fleet” is required to monitor the situation, especially the rate of scrappage of the highest emitters, in order to inform a policy that has the ability to respond rapidly to the realities (rather than the modeling) of what is happening household by household.

Reducing emissions over time, of course, requires the adoption and implementation of policies and interventions on a multi-sector basis. While this response letter is largely confined to transport sector policies and interventions that support decarbonization, other policies (particularly land use and housing policies) are synergistic and also important. The reality is that the transportation sector is the single largest contributor to greenhouse gas emissions, and the existential threat of Climate Change cannot be addressed without effectively reducing, and ultimately ending, tailpipe carbon emissions. Yet no solutions exist in a vacuum: in our interconnected society, effective carbon emission reduction strategies cannot be developed in silos that fail to take into account the consequences of those strategies on public health, the small and large business economies, land use that promotes emissions reduction, social and regional equity, and overall quality of life issues (collectively, I refer to these as “Resilience Factors”).

The right decarbonization plan for the Commonwealth will be one that addresses these Resilience Factors as essential elements of COVID-19 recovery. The Commonwealth's success at crafting and following a decarbonization plan that also contains a Sustainability Response to COVID-19 will determine whether we will emerge stronger, more resilient and well-positioned to embrace the opportunities of a 21<sup>st</sup> century society in a socially and regionally equitable way.

My primary concern with the CECP is its near-exclusive reliance on the transition of the Massachusetts light duty passenger vehicle fleet to Electric Vehicles ("EVs"). The CECP, and the Transportation Sector Technical Report ("Technical Report" or "TR") that informs the transport sector recommendations of the CECP, rely on the widespread adoption of EVs to the effective exclusion of other approaches, including mode shift. My concern is especially high because influencing the proportion of EVs in the fleet is, at present, largely almost completely in the control of the federal government. The federal government, through its ability to offer significant incentives to vehicle owners and manufacturers, and through its ability to regulate through setting CAFE Standards, will have an outsized impact on the transition to EVs in Massachusetts and across the nation.

A Massachusetts decarbonization plan must be rooted in short, medium and long term actions that Massachusetts can take and control. Acting sooner than later to realize emissions reductions will be important to the success of any plan. There is a time value to carbon emissions reduction: "emissions are cumulative and because we have a limited amount of time to reduce them, carbon reductions now have more value than carbon reductions in the future."<sup>1</sup> Massachusetts can act in the short term on travel demand reduction strategies that can have a measurable impact on emissions reduction while the Commonwealth advances a long-term EV strategy. It is in the area of transportation demand that state and local government have significantly more power than the federal government to bend the curve, and therefore it is in this area that the state should focus its efforts.

The Technical Report describes travel demand reduction strategies as measures that "do not appear capable of producing sufficient emissions reductions in a 30-year time frame to displace widespread electrification of on-road vehicles as the Commonwealth's primary Transportation Sector decarbonization strategy." TR pp 3-4. This framing of the issue encompasses the essential inadequacy of the CECP. Rather than fully evaluate and promote a robust multi-faceted set of policies and interventions that would be highly effective in the short and mid-terms, and also contribute to emissions reductions in ways that are mindful of other considerations (equity, externalities), the proposed plan sets up an analytical straw man with its legitimate but irrelevant assertion that demand side measures can't "displace widespread electrification" of vehicles. The standard for analysis and adoption should not be whether demand side policies and interventions have equal or even proportional impacts on emissions reduction but whether they contribute in a meaningful way to an overall approach to decarbonization that responds favorably to the Resilience Factors.

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<sup>1</sup> Strain, L., "Time Value of Carbon", Carbon Leadership Forum (2017). ("When we evaluate emission reduction strategies, there are two things to keep in mind: the amount of reduction, and when it happens.")



The TR candidly admits that one shortcoming of its modeling approach is its failure to address “broader objectives, such as mobility and access”.<sup>2</sup> Yet mobility and access are the lynchpins of all transportation systems. A successful decarbonization plan cannot ignore them. Indeed, an emissions reduction plan that fails to take into account these foundational elements of a transportation system will, by definition, provide an incomplete approach to decarbonization that will not succeed on the schedule the Commonwealth has adopted, and will fail to take the Resilience Factors into account. For example, ample research has documented that urban areas can achieve lower emissions “if they had certain spatial characteristics: (a) high population and employment densities that are co-located, (b) compact and mixed land uses, (c) a high degree of connectivity, and (d) a high degree of accessibility.”<sup>3</sup> These characteristics are the essential features of a high functioning public transportation system, and they are equally essential to a high functioning decarbonization plan.

Finally, there is an overarching question arising from the CECP: does the Commonwealth have an obligation to consider all of the externalities of its plan, including those that may be national or global in nature? For example, a well-to-wheel analysis of EVs would include the carbon impacts of this technology well beyond what comes out of the tailpipe. What are the labor and equity impacts of resourcing the raw materials essential to battery production? What are the carbon impacts of electric vehicle production? What are the carbon emissions tied to the supporting infrastructure of continuation of an auto-centric transportation policy, such as construction of parking facilities, highways and bridges? Building and maintaining this auto-centric infrastructure is not carbon neutral.

Ultimately, as noted by the respected national advocacy group Transportation for America, “solutions that revolve around everyone in America buying a new car fail to account for the millions who don’t drive or cannot afford an expensive, brand new electric vehicle. Put another way, if today you can’t safely cross your streets, if you can’t easily reach what you need quickly and easily, if you depend on transit service that’s spotty or inconvenient, if you can’t afford to buy a vehicle, if you are already paying more than 50 percent of your income on housing plus transportation, then merely swapping your gas cars for electric vehicles won’t improve your life.”<sup>4</sup>

The bottom line is this: current state transportation policies are literally driving people to drive more, and those people are driving vehicles powered by internal combustion engines. It may not be the purview of your secretariat to set transportation policy, but it bears repeating that the only effective decarbonization plan is a comprehensive and coordinated one. The CECP utterly fails to address the Resilience Factors referenced earlier in this letter, as it falls into the trap of putting all the emissions reduction eggs in one basket. Those Resilience Factors - public health, the small and large business economies, land use that actively promotes emissions reduction, social and regional equity, and overall quality of life – are crucial to any decarbonization plan that seeks to reduce emissions in a way that improves rather than ignores, or degrades, overall quality

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<sup>2</sup> TR p. 44.

<sup>3</sup> Creutzig, F., et.al., *Beyond Technology: Demand Side Solutions for Climate Change Mitigation*, Annu. Rev. Environ. Resour. 2016. 41:173–98.

<sup>4</sup> “Driving Down Emissions” Report <https://t4america.org/wp-content/uploads/2020/10/Driving-Down-Emissions.pdf>, p.6.

of life. In the absence of a more comprehensive and coordinated approach, the CECP is fundamentally at odds with the urgent need to decarbonize as much as we can as soon as we can, and in a way that supports overarching sustainability, economic growth and equity goals.

This response will explore these concerns through a discussion of three interrelated topics: (1) Mode Shift and VMT Reduction, (2) Impacts of EV Externalities, and (3) Equity.

## 1. Mode Shift and VMT Reduction

The most effective approach to reducing transport sector emissions will be a multi-modal approach designed in part to reduce VMT (vehicle miles traveled) and encourage (and actually induce) a meaningful level of mode shift from auto mobility to transit, rail, cycling or walking. The best, and easiest, way to reduce carbon emissions in the short and mid-term (in other words in the period before widespread EV adoption when the Commonwealth is ramping up its EV adoption and charging infrastructure efforts) is to reduce VMT, and the two proven ways to reduce VMT is to enact policies that reduce the amount of overall driving and that encourage or induce mode shift. Reducing VMT can be accomplished with short-term measures that are relatively low or lower cost and that respond directly to the Resilience Factors.

While I agree that vehicle electrification is essential to a comprehensive decarbonization plan, it cannot carry the load of this effort without support significant from the public transportation sector. The CECP sets a goal of EVs representing ~17% of the Commonwealth's projected 2030 light-duty fleet. That means something close to one million EVs in the hands of Massachusetts drivers.<sup>5</sup> This is a challenging target, given the multiple barriers to acceptance and purchase of these vehicles, barriers including vehicular range, availability, affordability, and the widespread deployment of accessible and convenient charging infrastructure that solves the conundrum of most urban housing lacking off-street parking and charging facilities. Massachusetts has control over many, but not all, of these barriers. If this ambitious target is not met, Massachusetts will fall behind in its efforts to reduce carbon emissions – *unless* it has, on a simultaneous basis, taken steps to induce mode shift to transit, rail, cycling and walking.

Mode shift is an attractive and quickly scalable option for carbon reduction. Mode shift is also largely an effort in the control of the Commonwealth and its transit and transportation agencies, as well as state and local land use and housing policies. Unlike the transition to EVs (or even hybrids or more fuel efficient ICE vehicles), which require federal action of some sort (*e.g.* a return to stronger CAFÉ Standards, and federal investments in EV charging infrastructure or federal tax subsidies for EV purchases), mode shift can be achieved through direct state action. As I explain further below, there are a number of low cost/high impact initiatives that can be adopted in the short term that will have a measurable effect increasing transit and rail ridership.

It may be a virtue that the CECP approaches its task with some optimism, but it must be realistic optimism. Based on all we currently know, the transition of the Commonwealth's light-duty vehicle fleet to fully electric will be slow, uneven, and unequal. Current EV sales nationwide are sluggish in overtaking combustion vehicles. As of 9/2019, EVs represented only 2% of annual

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<sup>5</sup> CECP p.21.

car sales (roughly 361,000 sold across the US out of 17.3M total).<sup>6</sup> That figure might increase to around 8% of all cars sold by 2026, but this is far slower than the pace desired by the CECP.<sup>7</sup> EV uptake will also likely be slow because it's essential requirement – the purchase of new vehicles - goes against established trends. Americans are generally holding on to their current vehicles longer than ever before. This has been a persistent trend: “The average light-duty vehicle now remains in service for over three years longer than it did two decades ago.”<sup>8</sup> New vehicles as a proportion of the US fleet have dropped from a high of 13% in 1975 to 7% in 2015. Current trends reveal that it would take ~15 years to turn over the entire US fleet.

Meanwhile, the pandemic has more people gearing up to buy cars *now* rather than later. Thus the CECP's envisioned initiatives to nudge consumers towards EVs might be frustrated by recent pandemic effects on consumer thinking. Recent surveys reveal that in Massachusetts, private vehicle ownership is on the rise, including an astounding 65% increase in the number of two+ car households since 2005. 18% of all households reported a pandemic-related sense of urgency to purchase a car, and 73% of those households intend to make the purchase in 1-3 years.<sup>9</sup>

Unfortunately, recent policies adopted by the MBTA to cut service, as well as the T's reluctance to push forward with low-cost initiatives like changing its service delivery model to a “frequent all-day” service across modes, have created an atmosphere of confusion, uncertainty and unreliability that may be pushing former transit riders to drive. The MBTA has also been slow to advance steps that would reduce emissions from its fleet of diesel locomotives. As I mentioned earlier, it is vitally important to make emissions reduction gains in the short term, given the uncertainties and barriers of transitioning to EVs. The MBTA should be a model agency demonstrating how to extract significant emissions reduction benefits from strategic investments and decision making. This extends to committing to a full electrification of its commuter rail locomotive fleet. To its credit, the T has explored the possibility of acquiring electric multiple units (EMUs) to replace its diesel locomotives, but progress has been painfully slow and prior leadership publicly dismissed the idea of full electrification. The T could also be making small but significant strides in its bus transit fleet, but has a historic hostility to catenary which defies sound judgment.<sup>10</sup>

These examples highlight the essential drawback of the Commonwealth's decarbonization plan, which appears to exist in a silo. This is particularly inexcusable since the Governor's Commission on the Future of Transportation expressly advised a shift of transportation strategy

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<sup>6</sup> <https://insideevs.com/news/368729/ev-sales-scorecard-august-2019/>

<sup>7</sup> <https://www.reuters.com/article/us-autos-electric-forecast/outside-of-tesla-future-ev-sales-in-u-s-may-be-thin-for-most-brands-study-idUSKCN1SZ20I>

<sup>8</sup> The Fuse: *America's Aging Vehicles Delay Rate of Fleet Turnover*, 7/9/2020. See also, “Driving Down Emissions” Report <https://t4america.org/wp-content/uploads/2020/10/Driving-Down-Emissions.pdf>, “EV adoption is slow, best case 30% worldwide by 2030.”, p.8

<sup>9</sup> Basu, R. and Ferreira, J. (2021). Sustainable mobility in Metro Boston: Challenges and opportunities post-COVID-19. *Transport Policy*. <https://doi.org/10.1016/j.tranpol.2021.01.006> .

<sup>10</sup> With specific respect to bus transit, the current state of battery technology is not mature enough to satisfy the demands of our cold weather conditions where cabin heat can reduce their ranges significantly. The MBTA could, in the very short term, double its electric bus network without any additional infrastructure, simply by using the existing overhead wire for its trolley electric buses to charge batteries through in-motion charging. Yet current MBTA policy is to abandon its existing overhead wire network. This thinking is both shortsighted and antagonistic to the decarbonization goals being advanced by the Commonwealth.

towards moving more people in fewer vehicles, while promoting and mitigating climate change. Given the policy guidance of the Governor’s Commission, it would be appropriate for the CECP to propose an immediate initiative to intervene with incentives to reverse the trend of 2+ vehicle households and encourage instead more 0 and 1-vehicle households.

Yet another barrier to success comes with the topic of adequate charging infrastructure. The CECP places a large focus on at-home and at-work charging stations, but a recent report from MIT’s Institute for Data, Systems and Society (“IDSS”) shows that even if these existed it would only allow for ~15% of the fleet to convert to EVs. Only widespread public and highway stations, as well as ample fast charging infrastructure, will enable widespread adoption on a scale currently contemplated by the CECP.<sup>11</sup> The IDSS study evaluates the vehicle electrification potential (“VEP”) of battery EVs as a way to measure the “friction of vehicles whose energy requirements can be met on all days.”<sup>12</sup> Their conclusion is a stark reminder of the enormity of the challenge: using Seattle as a case study, the IDSS report found that only ~12% of all vehicles could achieve VEP with at-home charging alone. Workplace charging raises the VEP to ~15%. To state the obvious, all of this will take much time, money, and cooperation from multiple public and private agencies and jurisdictions, and potential acquisition of land. In the meantime, efforts to reduce emissions through more quickly implementable and affordable travel demand and mode shift initiatives ought to take front-and-center in a coordinated state effort to achieve the 2030 and 2050 decarbonization targets.

Mode shift can be influenced by relatively affordable investments that can be made in the relatively short term. Many of these investments are also necessary to rebuild the public transportation system to respond to the Resilience Factors. For example:

- i. **Transit Service Delivery & Connectivity** - running more service, with greater frequencies, on the assets we have, including much more frequent bus service and 30 minute headways on the commuter rail system; accelerating construction of dedicated bus lanes to improve bus frequencies and capacity; building low cost/high impact improvements like the Red/Blue Connector to improve access and connectivity; fulfillment of the Phase 1 Regional Rail vision for inner core intercity rail in the immediate short term, with a commitment to implement full electrification of the regional rail system by 2035. Investments in Regional Rail that make it more rider-friendly would include construction of high-level platforms to reduce dwell times and, eventually, conversion of the entire system to an electric powered system operated with EMUs.<sup>13</sup>

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<sup>11</sup> Wei Wei *et. al.*, “Personal Vehicle Electrification and Charging Solutions for High-Energy Days” (“IDSS Report”), *Nature Energy* Vol 6, pp. 105-114, published online 21 January 2021; *see also*: <https://www.nature.com/articles/s41560-020-00752-y>

<sup>12</sup> IDSS report at p. 106.

<sup>13</sup> Electrifying the Commonwealth’s commuter rail network is not just good for reducing carbon and particulate emissions, it is a proven way to improve service reliability while reducing maintenance costs. In Canada, Ontario’s Metrolinx is moving in this direction, noting that “Electric vehicles run up to 29 per cent faster with 60 per cent lower operating costs per kilometer, delivering safe, fast and reliable service while reducing localized emissions and noise impacts.” [https://blog.metrolinx.com/2021/02/10/powering-up-why-an-updating-on-electric-transit-may-create-the-tracks-forward-for-metrolinx/amp/?\\_twitter\\_impression=true](https://blog.metrolinx.com/2021/02/10/powering-up-why-an-updating-on-electric-transit-may-create-the-tracks-forward-for-metrolinx/amp/?_twitter_impression=true)

Providing riders with more frequent and reliable all-day service, combined with policies that end current hidden subsidies and more fairly price roads and parking, is a sure way to attract more drivers to rail. The mode shift effects of investments in regional rail have been studied, with very promising results.<sup>14</sup> Also, adding more connectivity to the inner core subway system (Red/Blue Connector) will provide many people with viable public transit alternatives for trips that today default to some form of auto mobility (e.g. travel to Logan from Kendall Square; or Logan to MGH).

- ii. **Bicycle infrastructure** – the data makes clear the real possibility for mode shift to bicycle.<sup>15</sup> As cities enable more and safer cycling as a response to the pandemic and climate change, a new generation has been drawn to urban cycling. In addition to this measurable shift toward cycling, a recent report underscores the effectiveness of cycling as a short-term measure to reduce emissions, finding that “a new bikeshare station reduces vehicle ownership per household by 2.2%, vehicle miles traveled per person by 3.3%, and *per-capita vehicular GHG emissions by 2.9%*.<sup>16</sup> (emphasis added) The report also found “strong evidence to support the use of bike sharing as a first/last-mile connector to mass transit. Auto-dependence reductions are around 10% (more than thrice as high as average) where bikeshare connections to transit stations are less than one kilometer long. Finally, we find that vehicle ownership reductions are almost immediate and last up to a year, while vehicle use and emission reductions are lagged over 1.5 years.” Another study recently found that carbon emissions could be reduced by as much as 12% if 15% of urban VMT were shifted to e-bikes.<sup>17</sup>

Municipalities, working with the MBTA, can utilize road space for safe, protected bike lanes through quick-build pilots that are integrated with dedicated bus lanes. These pilots are the process for making it more

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<sup>14</sup> Nelldall, B. and Andersson, E., “Mode Shift as a Measure to Reduce Greenhouse Gas Emissions”, *Procedia: Social & Behavioral Sciences*, 48 (2012) 3187-3197 (partial mode shift to rail can reduce EU ghg emissions by ~20% through 2050).

<sup>15</sup> <https://mass.streetsblog.org/2020/09/29/bluebikes-ridership-is-approaching-its-pre-pandemic-levels/>; <https://road.cc/content/news/6-10-users-pop-bike-lanes-paris-new-cycling-280681> (“New cyclists account for almost six in ten users of pop-up cycle lanes in Paris, installed first in response to a public transport strike last winter with the network subsequently enlarged due to the coronavirus pandemic, according to figures from the city’s government.”).

<sup>16</sup> Basu, R. and Ferreira, J. (2021). Planning car-lite neighborhoods: Does bike sharing reduce autodependence? *Transportation Research Part D: Transport and Environment*. doi: [10.1016/j.trd.2021.102721](https://doi.org/10.1016/j.trd.2021.102721); see also Lindsay, G. et. l., “Moving urban trips from cars to bicycles impact on health and emissions”, <https://doi.org/10.1111/j.1753-6405.2010.00621.x> (Shifting 5% of vehicle kilometers to cycling would reduce vehicle travel by approximately 223 million kilometers each year, save about 22 million litres of fuel and reduce transport-related greenhouse emissions by 0.4%).

<sup>17</sup> Transportation Research Part D: Transport & Environment, Vol 87, October 2020, “The E-bike Potential: Estimating regional e-bike impacts on greenhouse gas emissions”, <https://doi.org/10.1016/j.trd.2020.102482>

attractive to walk and bike now and into the future. Especially as an urban strategy, decarbonization begins with reducing VMT by providing more people with more reliable and safe multi-modal alternatives to driving.

- iii. **Transportation Demand Management** (“TDM”) – Travel demand is the principal driver (no pun intended) of transport sector emissions.<sup>18</sup> TDM is a highly cost-effective strategy for reducing vehicular trips. Arlington, VA, a community of 200,000 people, spends \$10 million annually on TDM. The impact? 42,000 daily trips off the road. With similar commitments statewide in Massachusetts, what could we achieve?<sup>19</sup>

The policies that make TDM happen are relatively simple and policy based: supporting housing policies and road and parking policies that make it less likely people will drive. A recent study underscored the effects of widespread, free parking on VMT, demonstrating that “more parking led to more driving, less transit use, and less walking.”<sup>20</sup>

These policies include:

- a. Parking cash-out
- b. Revised parking standards
- c. Companies providing transit benefits vs. parking benefits
- d. Road pricing and parking pricing

It is disappointing that the CECP fails to offer a holistic approach to achieving its emissions reductions goals. This makes Massachusetts an outlier rather than a leader. A report issued in 2020 by the group Transportation for America noted, for example, that California needs to reduce VMT by 20% below present to reach its 2030 climate goal, even if that state reaches its 2030 ZEV goal (15%).<sup>21</sup> California’s plan makes clear that the state will not reach its 2030 GHG goals “without significant changes to how communities and transportation systems are planned, funded, and built.” Reduction in VMT is necessary to reach those goals.<sup>22</sup> That is true not just for California, but for states like Massachusetts as well, and the Commonwealth should strive to avoid repeating California’s early missteps.

Other examples abound. In Minnesota, the Minneapolis 80% carbon reduction goal by 2050 requires a 38% reduction in VMT.<sup>23</sup> In Maryland, Montgomery County aims for 100% electrification of vehicles by 2035 *and* mode shift goals: reduction of trips taken by private

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<sup>18</sup> <https://t4america.org/wp-content/uploads/2020/10/Driving-Down-Emissions.pdf> p.8.

<sup>19</sup> <https://ggwash.org/view/37043/10-steps-to-take-100000-cars-off-dcs-roads>

<sup>20</sup> [https://people.ucsc.edu/~jwest1/articles/MillardBall\\_West\\_Rezaei\\_Desai\\_SFBMR\\_UrbanStudies.pdf](https://people.ucsc.edu/~jwest1/articles/MillardBall_West_Rezaei_Desai_SFBMR_UrbanStudies.pdf)

<sup>21</sup> “Driving Down Emissions” Report <https://t4america.org/wp-content/uploads/2020/10/Driving-Down-Emissions.pdf>, p. 9.

<sup>22</sup> 2018 California Progress Report [https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report\\_SB150\\_112618\\_02\\_Report.pdf](https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf), p.5.

<sup>23</sup> Minneapolis 2040 Plan <https://minneapolis2040.com/topics/transportation/>

vehicle from 75% to 60%, and a doubling the proportion of bus/rail/bike trips by 2035.<sup>24</sup> Under their plan 13% of emission reductions will come from mode shift.

In contrast, the Massachusetts CECP fails to set a reasonable, achievable mode shift goal, nor does it address the land use, public realm design or zoning issues that are essential to reducing VMT and auto dependency. A more responsive regional rail network that offers 30 minute frequencies within the Route 128 inner core, a state-incentivized effort to support urban streetscape redesign, a focus on Transit Growth Clusters as vibrant work/live districts across the Metro Boston region could play a central role in simply reducing the amount of driving that people do.<sup>25</sup>

A recent Metropolitan Area Planning Council (“MAPC”) report on “The Impacts of Land Use and Pricing in Reducing VMT and Transport Emissions” concludes that while renewably-powered EVs are a necessary and worthwhile ultimate goal of any transport sector decarbonization plan, “it also matters how much people are driving.”<sup>26</sup> The MAPC report notes that “[a]ll other things being equal, more VMT necessarily means more emissions and greater demand for electricity.” Thus both “land use and the cost of driving are important factors in how much people choose to drive.”

The MAPC report uses a pair of established models testing a variety of land use and pricing policies to forecast VMT growth in Massachusetts by 2030 to demonstrate the essential inadequacy of sole or disproportionate reliance on electrification to meet the Commonwealth’s decarbonization goals. Its overarching point is that a “comprehensive climate plan cannot rely solely on efficiency and electrification if the amount of driving keeps rising unsustainably.”

Given the uncertainties and long lead times associated with EV adoption, a more effective approach would be for Massachusetts to limit the inevitable damage from increasing emissions in the next decade as we put the pieces together to advance more widespread EV adoption.<sup>27</sup> That requires investing in low cost/high impact transit and rail initiatives and changing service delivery to increase frequencies and capacity. In addition, if vehicle sales were regulated to allow no newly purchased vehicles to get less than 30 or 40 miles per gallon, effective in 2025, a significant amount of damage will be avoided. This probably requires federal action to be feasible, but it may be part of a more achievable and highly effective short-term measure.

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<sup>24</sup> Montgomery County, MD Climate Action Plan

<https://www.montgomerycountymd.gov/green/Resources/Files/climate/draft-climate-action-plan.pdf>, pp.114-115.

<sup>25</sup> See the discussion of Transit Growth Districts in

<https://www.abettercity.org/assets/images/Transportation%20Dividend%20-%20FINAL%20-%20012918.pdf>

<sup>26</sup> Metropolitan Area Planning Council report, “The Impacts of Land Use and Pricing in Reducing VMT and Transport Emissions in Massachusetts”, January 2021.

<sup>27</sup> Post-pandemic effects may hasten this race to more VMT. *See, e.g.*,

<https://kinder.rice.edu/urbanedge/2021/01/20/pandemic-imagine-no-traffic-less-congestion-reduced-emissions> “as vaccines become more prevalent, and depending on how quickly people feel comfortable enough to drive and fly again, we’d expect emissions to rebound unless there are major policy changes put in place.”

## 2. Impacts of EV Externalities

A transition to an all-electric light-duty fleet does not come without its share of significant impacts and externalities. These cannot be ignored as we seek to reduce carbon emissions in a principled manner. Some of those are local, and many others are national or global in nature. We cannot turn a blind eye to any of them.

**At the more local/regional level**, a future of more auto mobility and more vehicle miles travelled is a future of more chronic traffic congestion, more poor land use, more sprawl, and more particulate matter polluting the air in highly trafficked areas. Electric vehicles replacing ICE vehicles do not reduce traffic congestion.<sup>28</sup>

The “secret sauce” of Metro Boston’s business economy is its relative high level of productivity compared to other metropolitan areas nationally.<sup>29</sup> This is largely due to a clustering of jobs at or near transit nodes. These Transit Growth Clusters have fueled the Metro Boston economy. As detailed in the 2018 *Transportation Dividend Report* issued by A Better City:

In the MBTA system as a whole, the half-mile radii around rapid transit and commuter rail stations, representing just 5% of the region’s land area, hold 25% of its people and 37% of its jobs, and generate a disproportionate and growing share of its real property valuation. Alternatively, one can look at the “Inner Core”—the 20-municipality subregion where MBTA service is concentrated and proximity to rail and bus service is most common. The Inner Core occupies just 11% of the metropolitan region’s land area but contains 37% of the region’s population and 44% of its jobs. In fact, the Inner Core Subregion contains a quarter of all the people and a third of all the jobs *in Massachusetts*. The men and women who hold these jobs commute from all over the Inner Core, the metropolitan region, and the Commonwealth, following historic mobility patterns that developed as Metropolitan Boston evolved as a monocentric region connected through a “hub and spokes” transportation network.<sup>30</sup>

Massachusetts needs to learn from these findings and leverage the power of Transit Growth Clusters and transit connectivity to improve access and mobility and advance decarbonization. For example, it appears highly likely that the next decade will witness a biotech boom, accelerated by the importance of newly developed mRNA vaccines to national and global public health. Moderna’s headquarters in Cambridge, and the ongoing clustering of this industry in the Cambridge/Kendall Square area, highlights the importance of pro-growth policies that are carbon-friendly: more housing and more office space in proximity to these existing clusters, all connected by a multi-modal high quality public transportation system. Thus, the following low-cost/high impact intervention focused on transport connectivity could reduce VMT, reduce emissions, and serve as a model for the Metro Boston region: linking the Moderna Norwood lab to Kendall Square and the region with a new commuter rail station at Everett Street, relocated from the current Islington Station, providing an easy trip on the Red Line to the Franklin Line

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<sup>28</sup> <https://www.forbes.com/sites/carltonreid/2019/07/05/electric-cars-dont-reduce-congestion-but-bicycles-can-argues-uk-government-funded-report/?sh=587bc338323e>

<sup>29</sup> <https://www.abettercity.org/assets/images/Transportation%20Dividend%20-%20FINAL%20-%2020012918.pdf>

<sup>30</sup> Id. Pp. 5-6.



with a short shuttle ride to the Norwood campus. That kind of thinking, easy to implement at very modest cost, can be replicated throughout the region to make a measurable dent in VMT and carbon emissions.

In addition to these economic effects, the network of current MBTA infrastructure allows Massachusetts to avoid having to build 2,300 lane miles of highway and 3,000 acres of parking spots to accommodate the additional VMT that would occur without the public transportation system. An emissions reduction policy that fails to actively encourage transit and rail investment is one that inevitably commits the Commonwealth to more highway and parking spending, which means more poor land use choices, more congestion, more emissions and diminished public health.

The public health concern is an urgent one. As we focus on the existential threat of Climate Change and the need to reduce carbon emissions, we ignore the topic of particulate matter at our peril. We know from three studies undertaken in 2020 that long term exposure to particulates causes significant negative impacts on public health. A Harvard Chan School of Public Health study linked long-term exposure to particulates to a 15% higher COVID-19 mortality rate.<sup>31</sup> For all their carbon emissions advantages, EVs will continue to emit particulates in the air. These impacts are heightened in inner core communities. “Brake emissions tend to dominate the makeup of particulate matter in urban areas (where traffic must brake more regularly) – being responsible for over 55% of non-exhaust related emissions. This is due to brake particles being smaller in size (less than 0.1mm) and light enough to be caught in air turbulence and can easily enter human airways.”<sup>32</sup> The issue of particulate matter emissions associated with driving is multi-faceted and complex, but Massachusetts cannot ignore the importance of this issue to public health. Any decarbonization plan that encourages more driving requires a concomitant commitment to exploring a legal and regulatory framework that addresses and mitigates these impacts.<sup>33</sup>

EVs also represent a need for increased power supply from an emissions-heavy grid. As of October 2020, 79% of electricity generated in Massachusetts was through burning natural gas.<sup>34</sup> And the CECP recognizes that most EV charging will occur at night, outside of high-renewables parts of the day (see p. 24).

The CECP recognizes that the grid cannot support widespread BEV charging during peak hours. This raises the question: from where will the additional capacity come? It will take more spending to source it from renewables (which ought to be the goal) rather than from more natural gas. Yet only ~7% of regional electric generation comes from renewables.<sup>35</sup> On top of this, the

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<sup>31</sup> <https://www.hsph.harvard.edu/news/hsph-in-the-news/air-pollution-linked-with-higher-covid-19-death-rates/>

<sup>32</sup> <https://thebrakereport.com/clean-air-dirty-brakes/>

<sup>33</sup> See, e.g., EPA-420-R-14-013 (December 2014) “Brake and Tire Emissions from On-Road Vehicles”. <https://www.greencarcongress.com/2016/04/20160418-pm10.html>; [https://www.oecd-ilibrary.org/environment/non-exhaust-particulate-emissions-from-road-transport\\_4a4dc6ca-en](https://www.oecd-ilibrary.org/environment/non-exhaust-particulate-emissions-from-road-transport_4a4dc6ca-en) (“Electric vehicles are estimated to emit 5-19% less PM10 from non-exhaust sources per kilometer than internal combustion engine vehicles (ICEVs) across vehicle classes. However, EVs do not necessarily emit less PM2.5 than ICEVs. Although lightweight EVs emit an estimated 11-13% less PM2.5 than ICEV equivalents, heavier weight EVs emit an estimated 3-8% more PM2.5 than ICEVs.”).

<sup>34</sup> <https://www.eia.gov/state/?sid=MA#tabs-4>

<sup>35</sup> <https://commonwealthmagazine.org/energy/dpu-orders-gas-utilities-to-rethink-their-future/>

unfortunate reality is that Massachusetts utilities are notorious for foot dragging and frustrating efforts to address Climate Change. This was recently documented in a report by Brown University's Institute for Environment and Society.<sup>36</sup> Massachusetts utility companies are notoriously antagonistic to solar power and net metering, and it remains to be seen whether climate legislation being enacted into law early this year will fundamentally alter consistent past behavior. The Commonwealth must adopt an actionable plan to revise the regulatory framework for electric utilities in a manner that encourages utility cooperation with the advancement of renewables, including solar, through appropriately scaled incentives and penalties.

Then there are the revenue implications, the resolution of which cannot be deferred to the last minute. These revenue issues come in two primary forms: loss of revenue as a result of the diminishment and ultimate eradication of gas tax and (anticipated) TCI revenues, and the costs of (1) providing state subsidies for EV purchases, and (2) building the widespread charging infrastructure required to both facilitate adoption and ensure equity.

These costs, as yet unquantified, will likely be more massive than any of the transit-sector mode shift initiatives proposed in this letter. It is simply not responsible to advance an EV transition on the scale contemplated by the CECP without acknowledging the resulting ~\$1 billion loss of transportation revenue and proposing how to fill that loss fairly. On top of finding replacement revenue for the gas tax and TCI, Massachusetts will also need to identify funding for the massive subsidies that the CECP contemplates, and the construction of infrastructure made necessary by the plan. According to the TR, the subsidies alone run into the hundreds of millions of dollars.<sup>37</sup>

**At a global level**, we cannot ignore the realities of EV manufacture. This is not an argument to wholly abandon the transition to electric vehicles, but rather an argument to include in the CECP a commitment on the part of the Commonwealth to acknowledge these impacts and participate meaningfully in efforts to mitigate or reduce them.

For example, batteries are produced through fossil fuel-powered rare earth mineral extraction and a process that requires double the energy as production of a combustion engine vehicle.<sup>38</sup> In a 2019 letter eight British scientists pointed out that converting all UK vehicles to electric would require “two times the total annual world cobalt production, nearly the entire world production of neodymium, three quarters of the world’s lithium production and at least half of the world copper production” based on 2018 production levels.<sup>39</sup>

Severe environmental impacts of lithium mining around the world have also been reported including “mass fish kills related to lithium mining in Tibet... The freshwater supply is being consumed by mines in South America's lithium-rich region...[and] in North America, where mining regulations are strict, harsh chemicals are used to extract the valuable metal”.<sup>40</sup> Most of the mining for cobalt occurs in the DRC, a country marred by years and years of European colonization and “leached of its resources” by these actors. The CECP fails to take into account

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<sup>36</sup> <https://ibes.brown.edu/sites/g/files/dprej831/files/MA-CSSN-Report-1.20.2021-Corrected-text.pdf>

<sup>37</sup> TR Table 9

<sup>38</sup> <https://www.weforum.org/agenda/2017/11/battery-batteries-electric-cars-carbon-sustainable-power-energy/>

<sup>39</sup> Bryce, Robert, *Electric Vehicles Won't Save Us From Climate Change*, The Hill 9/11/19

<sup>40</sup> <https://www.cbc.ca/news/technology/ev-electric-vehicle-carbon-footprint-1.5394126>

the history behind this and the future regarding the needs for the continued production of batteries for these electric vehicles.

Our transition to EVs, while necessary, must be undertaken with a full and candid analysis of environmental effects and sourcing of materials, and with a commitment to mitigate those impacts in a meaningful way.

### 3. Equity

The transition to electric vehicles raises many equity issues that require resolution. These include affordability (both EV cost and the predatory auto loan industry that has a disproportionate effect on lower income individuals and households),<sup>41</sup> availability of convenient and affordable charging infrastructure, long-term exposure to particulate matter, and use of state revenue to provide lopsided purchase subsidies to wealthier, whiter suburban drivers while disinvesting in a more reliable, egalitarian public transportation system.

The CECP is also silent on the costs of car ownership, including but not limited to maintenance, insurance, costs of fuel, and costs of depreciation. These costs often rank second only to housing costs as the primary financial burden on lower income households. The *Transportation Dividend Report* issued in 2018 by A Better City discussed the importance of location efficiency in the productivity and inclusiveness of our Metro Boston economy, pointing out how “lower commuting costs can help offset higher housing costs. For the region as a whole, the average share of household income consumed by housing and transportation costs combined is 48%—just above the 45% affordability benchmark. But in 22 of our 24 illustrative Transit Growth Clusters, there are neighborhoods that fall below that benchmark.”<sup>42</sup>

A decarbonization plan that does not include a specific transit and rail improvement plan also has severe equity implications as many people are unable to afford a private automobile. For example, in the inner core neighborhoods of Boston, more than 30% of households in East Boston, Dorchester, Mission Hill, Longwood, and Roxbury, do not have access to private automobiles and have household incomes under \$52,000.<sup>43</sup> State subsidies for EV purchases, which are projected by the TR to be substantial, will likely fall disproportionately to wealthy residents of the Commonwealth, as recent data indicates.<sup>44</sup> Ultimately a future of more automobility is a more inequitable future. A recent study of 148 midsize cities across the country found that income inequality declined when the percentage of commuters using some form of transportation other than single occupancy vehicles increased.<sup>45</sup>

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<sup>41</sup> <https://frontiergroup.org/blogs/blog/fg/rj-explains-trouble-auto-loans> A significant share of that debt has been incurred by borrowers with lower credit scores, who are particularly vulnerable to predatory loans with high interest rates and inflated costs.

<sup>42</sup> [https://www.abettercity.org/assets/images/Transportation Dividend - FINAL - 012918.pdf](https://www.abettercity.org/assets/images/Transportation%20Dividend%20FINAL%20-%20012918.pdf), p. 36.

<sup>43</sup> <https://www.abettercity.org/assets/images/Transportation%20Dividend%20-%20FINAL%20-%20012918.pdf>, see Footnotes 88 and 90.

<sup>44</sup> <https://mass.streetsblog.org/2021/02/18/analysis-bay-states-ev-rebate-program-overwhelmingly-benefits-wealthy-suburbanites/>

<sup>45</sup> <https://www.tandfonline.com/doi/full/10.1080/13549839.2017.1385001?needAccess=true>

The pandemic's disproportionate impact on people of color and low income communities is a stark reminder that for too long we have accepted a society that deliberately separates and stratifies people in ways that are dangerous to their health and wellbeing. The advantages of privilege and wealth are on vivid display as many people can retreat to a second home, work from home, and accept delivery of nearly every imaginable home necessity, including food. The convenience of 21<sup>st</sup> century tech-enabled on demand services has further separated the lived experience of the haves and have nots. A return to the COVID-19 *status quo ante*, which historically shortchanged and often destabilized communities of color and lower income communities, or a flight to more insularity enabled by privilege (home delivery, work-from-home), will exacerbate structural inequities. We are already experiencing a K-shaped recovery, which ought to underscore the urgency of ensuring that all state planning efforts, including the CECP, to be especially mindful of equity. The CECP cannot do that if, as it candidly admits, it does not address the intertwined topics of mobility and access.

Providing a highly functioning and affordable public transportation system is one important way government can open up and support opportunities by providing reliable access to jobs, schools, healthcare, and other destinations. Car ownership is often the second largest household cost, and many low income workers and families have no access to an automobile. The high demand for bus transit even during peak pandemic periods reflects the importance of transit access for many people as a lifeline to the jobs and other destinations that they must reach in order to maintain basic life needs.

These realities ought to be taken into account and factored into the Commonwealth's decarbonization plan, which as currently developed in the CECP could have the effect of subsidizing wealthier, whiter communities while ignoring the needs of traditionally disadvantaged communities for more reliable modal alternatives to driving. In this sense, decarbonization must be closely linked to transit equity, a term covering many aspects of building a more fair and egalitarian society. It touches upon the quality of services provided, the affordability and legibility of those services, and the availability of those services when they are needed.

When discussing quality of transport services from an equity perspective, the factors that comprise a high functioning system that will attract riders from every social and economic group (and thus reduce emissions by reducing overall VMT) are relevant: service that is frequent, service that is perceived as safe and offers ample capacity without crowding (*i.e.*, treats riders with respect and dignity), using equipment that is well maintained and reliable, with schedules and service delivery that meets the needs of the economy it services, and with routes and transfers that are legible enough to provide connections between people and destinations without lots of anxiety, research or inconvenience. Such a system will attract riders from across social and income spectrums, creating the kind of egalitarian system that promotes equity and social cohesion and sustains a higher level of maintenance and service reliability.

If the Commonwealth's combined state transportation and decarbonization policies accelerate a separation of people by transport mode according to income and privilege, which is a natural consequence of current MBTA policies and a CECP that ignores mode shift and promotes high-subsidy EVs as its singular solution, they will end up creating more segregation, and therefore

more inequity, over time. A more equitable future is one that is a more inclusive, offering more people more choices for their personal mobility.

A recent *New York Times* opinion piece by Farhad Manjoo summarized the underlying concern that forms the common thread of this response. He wrote, “The planet will be much better off if we switch to electric cars. But gauzy visions of the guilt-free highways of tomorrow could easily distract us from the larger and more entrenched problem with America’s transportation system. That problem isn’t just gas-fueled cars but car-fueled lives — a view of the world in which huge private automobiles are the default method of getting around.”<sup>46</sup> For Massachusetts to advance decarbonization in the transportation sector wisely, equitably, and sustainably, it cannot proceed with an all-EV approach that gives short shrift to reducing VMT and encouraging mode shift to transit, rail, cycling and walking. We must do both, and in the short term focusing on reducing VMT and mode shift will be easier, less expensive and more quickly effective as approaches that reduce emissions while also responding to urgent public health, economic productivity, equity and quality of life issues that cannot be addressed simply by a transition to electric vehicles.

I thank you for the opportunity to comment on the Interim CECP and hope that these suggestions and recommendations will be favorably received.

Best regards,



James Aloisi

cc: Jamey Tesler, Secretary of Transportation  
Joseph Aiello, Chair, MBTA Fiscal Management & Control Board

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<sup>46</sup> <https://www.nytimes.com/2021/02/18/opinion/electric-cars-SUV.html>

February 23 ,2021

To Whom It May Concern,

My name is Manijeh Berenji, a practicing physician at Boston Medical Center and Assistant Professor at Boston University of School of Medicine. I am a board-certified environmental medicine specialist with expertise in climate and health. I am writing to you on behalf of my patients of color who disproportionately have been affected by the downstream effects of climate change on their respective health.

I have been actively following the recent climate discussions here in Massachusetts State Legislature. I have communicated with my legislators actively in the last few months.

I am a strong proponent of strong, clear climate policy that will help all people but with a specific focus on our BIPOC communities (who have been for too long marginalized in decision making). For the good of the Commonwealth, please consider the following:

**Cut emissions 50% by 2030**

I support EEA's [draft Clean Energy and Climate Plan \(CECP\) for 2030](#). However, I strongly urge you to set the state's emissions reduction target for 2030 at 50%, not 45% – 50% as in your latest legislative proposal. The state's emissions reduction goals must be based on science, which includes the IPCC's target of holding emissions to a level which will keep global temperatures from rising more than 1.5 degrees centigrade. This requires cutting emissions at least 50% by 2030. Studies have shown that states and countries that take similarly ambitious steps have seen net increases in household income and economic growth, not decreases. Additionally, the benefits to bolder action mean more green jobs in the state and healthier communities with cleaner air.

**Create a strong cap on emissions from the buildings sector, as you proposed**

Additionally, I join many others in urging you to take strong action in reducing greenhouse gas emissions and pollution originating from the buildings sector. This includes creating a strong cap on heating fuel emissions by 2023, as you proposed in the draft CECP, including a price on emissions placed on companies importing heating fuels. These are some of the hardest emissions to reduce, and require swift and decisive action now so that new construction in Massachusetts will benefit from decreased costs of energy, and our communities can see reductions in localized air pollution caused by the burning of fossil fuels.

In addition, the funds taken in through the sale of emissions permits must be used equitably to protect low-income people and environmental justice communities, through both rebates and assistance in making their homes more energy efficient and converting their heating to non-fossil fuel systems.

Thank you for consideration of these comments.

Sincerely,

A handwritten signature in black ink, consisting of two distinct parts. The first part is a stylized, cursive 'M' with a vertical stroke through it. The second part is a more fluid, cursive signature that ends in a loop.

Manijeh Berenji MD MPH

**2030 CECP Comments**  
Mike Duclos – 3/15/21

Thank you for the opportunity to comment on the tremendous amount of work that has gone into the 2030 CECP. This is an impressive effort, which has surfaced some challenges when implementation details are considered for key **components**.

The challenge of thermal enclosure improvements, and heating electrification, which I'll call **retrofits**, of 1,000,000 homes by 2030, is about 400 homes each week day, for the next ten years. A compelling public education program should be initiated soon, since it will take some time for the message to be understood, discussed and accepted by the public, before retrofits can be realized **'at scale.'**

Large scale retrofit workforce training is needed. Heat pump equipment cost and availability should be addressed by a **supply chain management program** as developed in Vermont. Strategies to address the wide variety of home designs, maintenance approaches and heating and cooling distribution systems should be developed in consultation with the implementers: **thermal enclosure specialists and HVAC installers.**

Compelling incentives to entice massive numbers of homeowners, **renters in multi-unit buildings**, addressing low and moderate income, etc. need to be **designed, financed and implemented.**

The CECP **Heating Fuel Emission Cap** program must be designed, implemented and operate for long enough that the fuel price impact is visible to homeowners as **current fuel prices** which will be a critical part of: the 'value proposition' used to **sell retrofits to the public.**

To be sure all of the above **components** necessary to sell retrofits at scale are available in time, we may have to think differently.

We may need to consider a 'rapid deployment model,' scheduled by starting at 2030 and working backwards in time to determine the **date** when each of the key **components** outlined above must be in place to deliver the 2030 emissions reduction on time.

At the very least, the next CECP revision should include a strawman 'project timeline' with implementation deadlines for all key **components**,



to the assess the **feasibility** of the CECP, and so we can track progress over time.

Finally, **actual** energy use must be **monitored** to confirm the anticipated emissions reductions are realized, so corrective action can be taken in time to meet the 2030 goal.

Thanks very much for the extraordinary effort that has gone into the CECP, and for the opportunity to comment.

November 15th  
Ron O'Connor  
Office of local and Regional Health

My name is Beth Grader, a longtime resident of Marblehead Massachusetts. Over the years I have observed landscape companies providing yard services using non-English speakers. I am concerned these employees using gas powered leaf blowers for up to 8 hours a day, have no awareness of the health risks associated with these tools.

The three areas of concern are, (1) noise damage to the user's hearing and noise annoyance of the community; (2) high levels of air-borne pollution including both fine particulate matter and toxic exhaust; (3) absence of mask wearing during this pandemic.

When two or often three leaf blowers are used simultaneously the sound is deafening. Actually, well documented studies show that constant exposure to these machines has been found to cause hearing loss or possibly tinnitus as well.

The unburned fuel from the inefficient 2 cycle gas powered leaf blower not only produces harmful fine particulate matter but it spews excessive hydro organic compounds as well as carbon monoxide, nitrogen oxides and benzene. These invisible particles pour into the lungs of these operators putting them at higher risk for COVID 19. Air pollution is known to increase the risks related to spreading COVID as found in a recent Harvard study.

Electric and battery powered leaf blowers are available, as are other methods of dealing with leaves. As a master gardener I have always mulched the leaves on my property. Some Massachusetts communities do have seasonal restrictions on leaf blowers, only allowing for fall and spring clean up. Summer use exacerbates these problems. I have written letters to our local paper, an OP-ED and contacted OSHA to expose the abuse of particularly, gas powered leaf blowers.

I have addressed these concerns to our Marblehead Board of Health, Governor Charles Baker, and State Representative Lori Ehrlich. So far, none other than Lori have shown any concern. I feel let down by our town BOH as I have made numerous presentations to expose this scientific health threat. Even though they agree it is a health issue, they maintain it is not their responsibility to regulate landscapers, although they do regulate other industries in town.

Whose responsibility is it to protect these vulnerable workers and residents?

All these issues are well documented by Jamie Banks PhD on the website:

[quietcommunities.org](http://quietcommunities.org) .

Our goal is to prohibit the use of GPLB's especially during this pandemic.

OSHA did agree to contact one landscaping company, after I made an informal complaint. It is not possible for me to police the entire community for each infraction.

I am looking for guidance on how to mediate the landscapers' condition as well as help control the spread of COVID in our community. It appears to me this is a gaping hole in our community protection. During this time when we are all either schooling or working remotely at home I have suggested a moratorium on GPLB's. The long periods of noise from the leaf blowers disrupts concentration and wellbeing.

Any advice or suggestions would be greatly appreciated.

Respectfully,  
Beth Grader  
9 Mill Pond

Marblehead, MA 01945 You can contact me [begrader@gmail.com](mailto:begrader@gmail.com) or call 781-910-1500

You can contact me at [begrader@gmail.com](mailto:begrader@gmail.com) or call 781-910-1500

# Optimization, monitoring, and maintenance of cooling technology

**KIGALI**  
COOLING EFFICIENCY PROGRAM

This Knowledge Brief from the Kigali Cooling Efficiency Program, outlines the need for maintaining and servicing of cooling technology. It estimates that better optimization, monitoring, and maintenance of cooling equipment the potential to save 30Gt of CO<sub>2</sub> emissions by 2050.

## THE NEED FOR COOLING EFFICIENCY

Cooling is essential to health, prosperity, and the environment, underpinning many of the Sustainable Development Goals. Yet currently most cooling is energy intensive and highly polluting. Demand for cooling is booming, so there is an urgent need to not only cut pollution from existing cooling but to ensure future cooling needs are met sustainably.

## COOLING ACCOUNTS FOR > 7% GHG EMISSIONS

Use of cooling technologies causes substantial global GHG emissions of between 3.8<sup>1,2</sup>, and 4.1<sup>3</sup> GtCO<sub>2</sub>eq p.a. (>7% global emissions). The International Institute of Refrigeration has estimated that cooling consumes 17.2%<sup>4</sup> of global electricity (c.3,500 TWh p.a. based on 2015 consumption)<sup>5</sup>. Indirect emissions from electricity to power cooling technologies causes 63% of cooling emissions<sup>6</sup>. The impact of global GHG emissions from cooling equipment is projected to grow between now and 2050 as developing nations gain access to energy and new technologies. It is estimated that improving the efficiency of cooling equipment between now and 2050 can avoid the emission of approximately 80Gt CO<sub>2</sub>eq.

## OPTIMIZATION, MONITORING, & MAINTENANCE CAN REDUCE TOTAL COOLING GHG EMISSIONS BY 13%

Neglecting the optimization, monitoring, and maintenance of cooling equipment results in increased energy use, lower cooling performance, and shortens equipment life. Effective optimization,

monitoring, and maintenance of cooling equipment could deliver substantial electricity savings of up to 20%<sup>7</sup> (700 TWh), particularly if equipment has not been maintained for a long time, leading to emissions savings of up to 0.5Gt CO<sub>2</sub>eq p.a.



The global stock of room air conditioners is expected to grow from 900 million in 2015 to 2.5 billion units in 2050. (Clean Energy Ministerial, 2016)



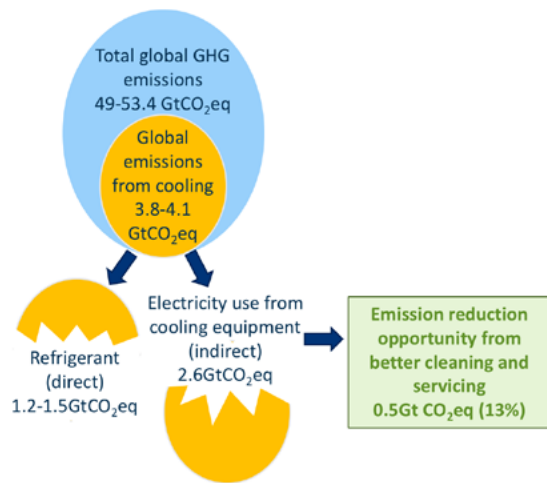
The Carbon Trust, the International Institute of Refrigeration, and ASHRAE have supported the Kigali Cooling Efficiency Program in the publication of this brief.

'Better optimization, monitoring, and maintenance of cooling equipment has the potential to save 30Gt of CO<sub>2</sub> emissions by 2050 - contributing a further 38% of savings on top of those delivered through the planned phase down of high GWP refrigerants agreed at Kigali.'

– Didier Coulomb, Director-General, International Institute of Refrigeration

Policy makers should make effective optimization, monitoring, and maintenance of cooling equipment a key goal as the 20% savings in electricity translate into a 13% reduction in total cooling emissions (including GHG emissions from refrigerants). Figure 1 breaks down annual global GHG emissions to the opportunity presented through better optimization, monitoring, and maintenance of cooling equipment.

Figure 1 – Breakdown of annual total global GHG emissions to the cleaning and servicing opportunity



Sources: PBL Netherlands Environmental Assessment Agency, 2017; International Institute of Refrigeration, 2017; IPCC, 2014; Green Cooling Initiative, 2016, Carbon Trust analysis. All carbon savings numbers in Figure 1 relate to potential cumulative savings from now to 2050. They represent an initial, indicative view of savings and will be refined through further work.

**SECTOR FOCUS: UNITARY AIR CONDITIONING**

Unitary air conditioning (UAC) refers to ductless split, ducted split and rooftop ACs, variable refrigerant flow (VRF) systems and self-contained units. Typically, one unit will be installed per room, apart from VRF systems and multi-splits which can be used to cool several rooms (Green Cooling Initiative, n.d.).

UAC is the largest cooling market with an estimated installed base of 870-950 million units (2017)<sup>8</sup>, about 30% of the three billion pieces of cooling equipment in use around the globe (International Institute of Refrigeration). UAC annual sales were

approximately 100 million units (2012) worth USD 73 billion (Green Cooling Initiative, n.d.).

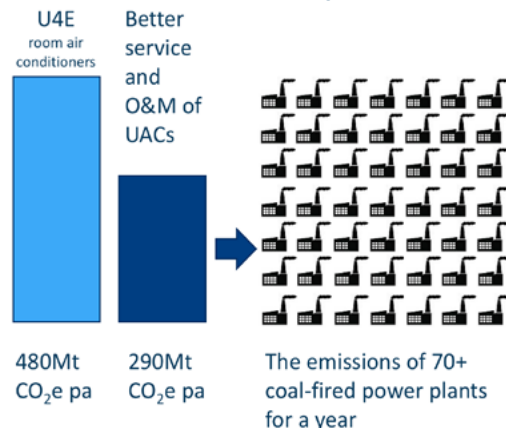
**UAC ACCOUNTS FOR 30% OF ALL COOLING GHG EMISSIONS**

Given their abundance, UACs are a major contributor to cooling related GHG emissions, estimated by the Green Cooling Initiative to be 1.28Gt of CO<sub>2</sub>eq (in 2016) - equivalent to around 30% of total cooling GHG emissions in 2017. The 1.28Gt of CO<sub>2</sub>eq break down into 330Mt related to refrigerant emissions and 950Mt from indirect emissions due to electricity consumption. Potential emissions reductions through effective optimization, monitoring, and maintenance are estimated to be 190Mt CO<sub>2</sub>eq p.a. based on 2016 electricity consumption, rising to 290Mt CO<sub>2</sub>eq p.a. by 2030<sup>9</sup> - equivalent to the emissions of over 70 coal-fired power plants in one year<sup>10</sup>. By comparison, the UN's United for Efficiency (U4E) estimates the total emissions savings opportunity across 150 developing countries of switching to energy efficient and climate friendly air conditioners at 480 Mt CO<sub>2</sub>eq p.a. by 2030. Emissions reductions do not include those that exist due to better leakage management.

**ACTION TO OPTIMISE, MONITOR AND MAINTAIN COOLING EQUIPMENT COULD SAVE 30GT CO<sub>2</sub>EQ BY 2050**

Following this same approach, an estimate for the potential impact of better optimization, monitoring, and maintenance on the overall cooling market to 2050 can be obtained. Based on total cooling emissions from electricity in 2016 of 2.6Gt CO<sub>2</sub>eq, 20% savings would deliver 0.5Gt CO<sub>2</sub>eq of savings p.a. Again assuming a 3% compound annual growth rate, total savings could reach 1.4Gt p.a. by 2050 - equivalent to the emissions of nearly 350 coal-fired power plants for a year. This would represent a cumulative saving of 30Gt by 2050.

Figure 2 – Potential emissions savings opportunities by 2030



## COLLECTIVE ACTION IS ALREADY IMPROVING THE QUALITY OF UAC EQUIPMENT.

Given the scale of GHG impacts due to UAC, current global and regional initiatives are focused on controlling emissions due to product design inefficiencies, including the United for Efficiency initiatives, SEAD, CLASP, and EU EcoDesign.

## THE IMPACT OF THESE INITIATIVES COULD BE LOST THROUGH POOR OPTIMIZATION, MONITORING, & MAINTENANCE OF COOLING PRODUCTS.

In addition to initiatives encouraging use of energy efficient products, policy makers are encouraged to develop national cooling equipment optimization, monitoring, and maintenance competencies in industry and the user base. This could include:

- Setting up an independent national standards body
- Creation of national standards for cooling optimization, monitoring, & maintenance.
- Programme of audits of refrigeration technologies to identify optimization, monitoring, & maintenance opportunities
- Investment in facilities providing best practice training in, as examples, equipment optimization and monitoring, supplier maintenance, or customer maintenance management programmes
- Developing supply chains for optimization, monitoring, & maintenance technologies.

Adoption of such practices could reduce needless emissions due to poor optimization, monitoring, and maintenance practices.

## OPTIMIZATION, MONITORING, & MAINTENANCE PROJECTS

From initial research undertaken as part of preparing this brief, few examples of programs focused on better optimization, monitoring, and maintenance of cooling equipment have been uncovered - possibly reflecting difficulties implementing programs in some hard-to-reach sectors (e.g. residential) or that these elements in other sectors (e.g. commercial) are not made explicit. Nevertheless it seems likely that optimization, monitoring, and maintenance programs represent a major opportunity for energy and emissions savings. The following examples of what has been done give a sense of what can be implemented on the ground to take advantage of this huge opportunity.

## ASHRAE

A trial to understand the benefits of coil cleaning was conducted at 1500 Broadway, Times Square in New York City between July and September 2005. The 34 storey building has 4 air handling units servicing 111 500 m<sup>2</sup> of air conditioned and heated space. The trial showed that good maintenance and operating practices including coil cleaning significantly improved the energy efficiency of the HVAC&R systems by 10% to 15% and delivered comfort increases. The trial also identified other optimization and maintenance processes that will improve energy efficiency for years to come. ASHRAE (2006)<sup>11</sup>.



## DEFRA UK

As part of a UK Department of Food and Rural Affairs Programme identifying reductions in energy inputs to the food industry, a trial was undertaken to assess the impact of applying low cost maintenance measures to commercial fridges at the University of Bristol Langfood Canteen. The canteen provides 200 to 300 meals per day. One large upright fridge consumed 40% of the canteens cooling load. Inspection of the fridge showed it had a dirty condenser which when cleaned delivered an 8% energy efficiency saving. The fridge was also found to have too low a temperature set point which was raised from -21°C to -16°C, giving an additional 11% energy efficiency saving. Together these two measures delivered a 19% energy reduction. (Defra)<sup>12</sup>.



## THE CARBON TRUST

The Carbon Trust, the UK Institute of Refrigeration and the British Retail Association worked together to propose a set of monitoring, maintenance and technology optimization measures that when applied could significantly reduce emissions from retail refrigeration equipment. A basket of monitoring, optimisation and maintenance measures could improve energy efficiency by 20 to 30% (e.g. training, cleaning and maintenance, re-commissioning, set-point temperature, store temperature). Additional technologies could significantly increase these savings<sup>13</sup>.



## ABOUT K-CEP

The Kigali Cooling Efficiency Program (K-CEP) is a philanthropic collaboration launched in 2017 to support the Kigali Amendment of the Montreal Protocol and the transition to energy efficient, climate-friendly, affordable cooling solutions for all. K-CEP's secretariat, the Efficiency Cooling Office, is located at the ClimateWorks Foundation.

## K-CEP SUPPORT FOR OPTIMIZATION, MONITORING, & MAINTENANCE

Optimization, monitoring, and maintenance represent a major opportunity for the range of projects and activities funded by K-CEP. Existing and future projects should consider the possibility of adapting or expanding their brief to include an optimization, monitoring, and maintenance element.

## FEEDBACK ON THIS BRIEF

The Carbon Trust put together this brief for K-CEP with assistance from the International Institute of Refrigeration and ASHRAE. We would welcome any feedback on calculating the emissions reduction potential of better optimization, monitoring, and maintenance and on better understanding the landscape of optimization, monitoring, and maintenance more generally. Please contact Paul Huggins at [paul.huggins@carbontrust.com](mailto:paul.huggins@carbontrust.com).

## CONTACT US

For more details please visit [www.k-cep.org](http://www.k-cep.org), follow us at [@Kigali\\_Cooling](https://twitter.com/Kigali_Cooling), or contact us at [info@k-cep.org](mailto:info@k-cep.org).

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4. Cited in International Institute of Refrigeration, 29th Informatory Note: The Role of Refrigeration in the Global Economy, November 2015.
5. Based on 1737 Mtoe (= 20,201 TWh) of total electricity consumed globally in 2015. Taken from IEA, Key world energy statistics 2017, 2017, p41.
6. International Institute of Refrigeration, 35th Informatory Note, The impact of the refrigeration sector on climate change, December 2017
7. Research for this brief indicated savings could range from as low as 3 to 4% to as high as 60% or more. Multiple studies gave savings in the range 15 - 25%.
8. These estimates are based on 750 million UAC units in 2012 (Green Cooling Initiative) and 900 million UAC units in 2015 (Clean Energy Ministerial), extrapolated using a 3% compound annual growth rate (itself sourced from the Clean Energy Ministerial assumption that UAC units would reach 2.5 billion by 2050).
9. This assumes that the 2016 emissions of 1.28Gt of CO<sub>2</sub>e are produced by 843 million units, which rise to 1,268 units by 2030 and consume electricity with a constant emissions factor. The unit numbers are based on 750 million UAC units in 2012 (Green Cooling Initiative) and a 3% compound annual growth rate 2015-2050 provided by the Clean Energy Ministerial in 2016.
10. Based on calculations using the U.S. Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator.
11. Study Verifies Coil Cleaning Savings Energy. Ross D. Montgomery, P.E., Member ASHRAE; and Robert Baker, Member ASHRAE, ASHRAE Journal. Nov 2006. 34-36.
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## **Comments to the Massachusetts Interim Clean Energy and Climate Plan 2030**

Prepared by: Paul Joy of Belmont, MA

The Interim Clean Energy Clean Energy and Climate Plan 2030 issued by the Massachusetts government is an important first step in helping the Commonwealth and all of the Northeast prepare for significant changes in the decade to come. However, like a lot of government and policy oriented reports on the energy transition, it falls short in asking the critical questions about technology change, future costs of solar, wind, and battery technology, and electric vehicle and building electrification. The question this report is trying to answer, about reducing carbon emissions, is fundamentally not the right question. What Massachusetts should really be asking is: is it possible to generate 100% of our electricity with solar, wind, and batteries? Secondly, how can a new energy system based on solar, wind, and batteries minimize costs and maximize benefits at every level of society and the economy?

Americans—from New England, Texas, California, and everywhere in between, are hungry for economic, political, social, and cultural change. The bottom 50% of American households haven't seen a significant pay increase in 50 years, the children from the bottom 20% of households are graduating from college at almost the same rate as they were thirty years ago. Energy transformation done poorly will only exacerbate American inequality, making it far more likely that other countries will win the race to the top.

### **Energy Generation Disruption**

RethinkX, a think-tank, recently issued a report asking these very questions. The answer to the 100% solar, wind, and battery energy system was absolutely yes—it not only is possible, but this new energy system “is growing exponentially worldwide and disruption is now inevitable because by 2030 they will offer the cheapest electricity option for most regions (including New England). Coal, gas, and nuclear power assets will be become stranded during the 2020s, and no new investment in these technologies is rational from this point forward.” RethinkX also found that this new system will be much larger than the one we currently have—it will produce a much larger amount of total energy allowing for transportation, residential, commercial, and even industrial electrification.

How is this possible? It starts with falling costs of solar, wind, and batteries. RethinkX found that solar costs over the past 10 years have declined by 82%, and will continue to drop another 72% (20x total drop) by 2030. Wind has also declined 46%, and will drop another 43% to 2030 (3x total drop). The largest cost decline is in batteries, which have dropped 87% the past 10 years and will drop another 80% (45x total drop) by 2030.

The following is their New England Summary of Findings

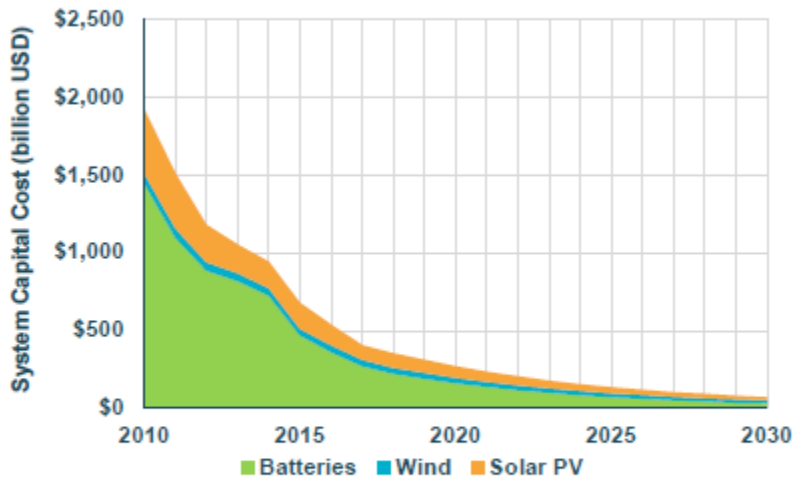


NEW ENGLAND	Lowest Cost 100% SWB System	Lowest Cost 100% SWB System + 10% Investment	Lowest Cost 100% SWB System + 20% Investment
Capital cost	\$91 billion	\$100 billion	\$109 billion
Solar PV capacity	87 gigawatts	158 gigawatts	197 gigawatts
Wind capacity	27 gigawatts	27 gigawatts	27 gigawatts
Generation capacity	3.8x	7.3x	10.8x
Battery capacity	1232 gigawatt-hours	835 gigawatt-hours	729 gigawatt-hours
Battery average demand hours	89 hours	58 hours	43 hours
Annual super power	61 terawatt-hours	143 terawatt-hours	189 terawatt-hours
Fraction of days with super power	64%	84%	91%
Electricity cost (0% of super power utilized)	6.1 cents/kilowatt-hour	6.6 cents/kilowatt-hour	7.2 cents/kilowatt-hour
Electricity cost (50% of super power utilized)	4.9 cents/kilowatt-hour	4.2 cents/kilowatt-hour	4.1 cents/kilowatt-hour
Electricity cost (100% of super power utilized)	4.0 cents/kilowatt-hour	3.1 cents/kilowatt-hour	2.8 cents/kilowatt-hour

Source: RethinkX

RethinkX also modeled the capital costs of his system from 2010 to 2030. They reported “Since 2010, the combined capital cost of solar PV, wind power, and batteries has fallen 85%, and it will decline a further 75% by 2030. This represents a 96.5% decline, or 30x improvement, in just 20 years.

**Figure 26. New England 100% Solar, Wind, and Batteries System Capital Cost 2010-2030**

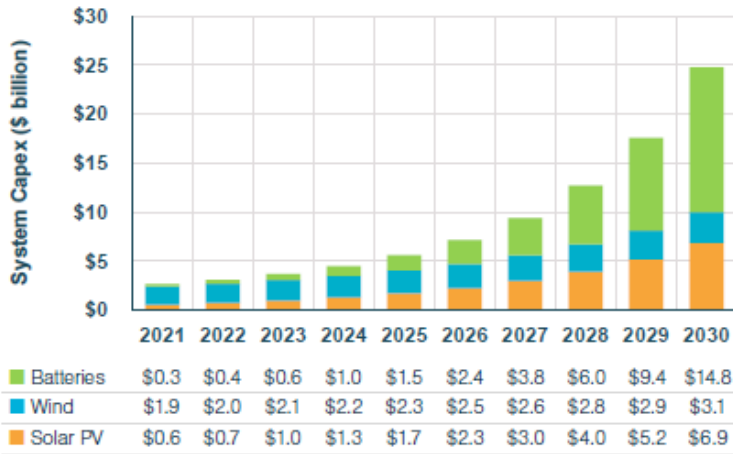


Sources: Berkeley Labs, 2019; NREL, 2019; BNEF, 2019; RethinkX, 2020.<sup>128</sup>

**The capital cost of a 100% SWB system in New England has fallen by 85% since 2010, and will decline another 75% by 2030.**

They also modeled the capital costs required over 10 years to build such a 100%, \$91 Billion system, year-by-year:

**Figure 27. New England 100% SWB System Capex by Year for Exponential Buildout**

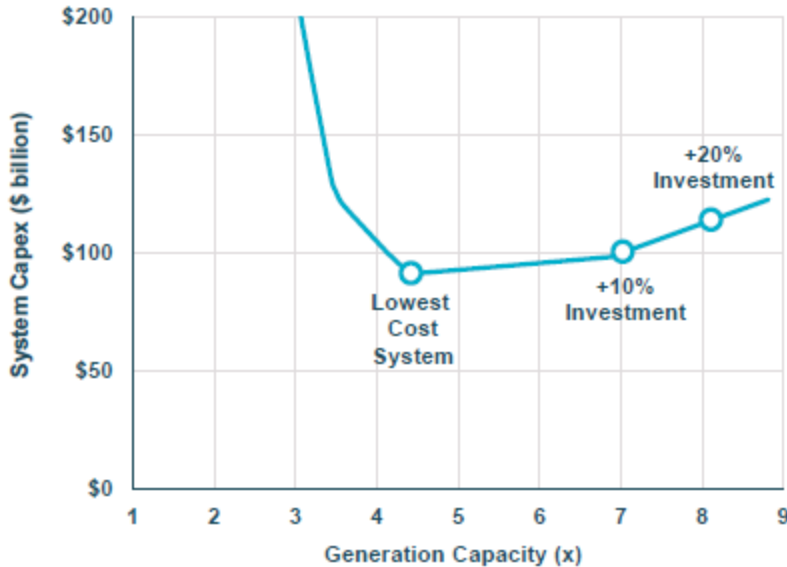


Source: RethinkX

**Annual investments in the exponential buildout of a lowest cost 100% SWB system in New England totaling \$91 billion are dominated by solar PV and wind power in early years, and by solar PV and batteries in later years.**

Finally, while most analyses typically only look at renewables replacing traditional energy for 70%, 80%, or maybe 90%, RethinkX found that there is an inverse cost relationship between generation capacity and energy storage, seen below in what they call the Clean-Energy U-Curve. They also found that additional capital investments can significantly increase overall system capacity (as seen above in the summary of findings). They also found that overall costs increase as generation capacity decreases below 4.4x, as seen below.

**Figure 24. The Clean Energy U-Curve for New England**



Source: RethinkX

The Clean Energy U-Curve for New England shows that there is a nonlinear tradeoff relationship between generation capacity and battery energy storage. Most conventional analyses to date have assumed that building more than 1.5x generation capacity is infeasible, and as a result many weeks of battery energy storage would be required at enormous cost. Using the Clean Energy U-Curve, our analysis shows that in New England the most affordable combination of these technologies comprises 4.4x generation capacity with only 89 hours of battery energy storage for a total system capex of \$91 billion. This is much less expensive than most conventional analyses have claimed.

### Transportation System Disruption

In your report, you wrote that “With the help of strong state and federal policy incentives and standards, light-duty electric vehicles (EVs) have made rapid progress over the past decade and now represent feasible solution for many Massachusetts residents.” EVs can last on the road longer (up to 500k miles), offer 10x savings on fueling costs (even with our current system), and are far less expensive to maintain. But the report is wrong when it suggests we need to wait to 2030 for cost parity—upfront vehicle costs today are already reaching cost parity with new internal combustion engine cars and, like solar, wind, and battery costs, will continue to decline in price below \$20k in the next five years. We are also seeing advances in autonomous technology that could very well give way to vast self-driving electric automobile fleets. Elon Musk of Tesla has promised such a Robotaxi fleet as soon as late 2021.

RethinkX has also looked at transportation disruption. In 2017, they concluded that “technological and business model convergence would result in a 10x improvement in costs and capabilities of new technologies, disrupting transportation as soon as 2021. As a result, by 2030, 95% of all US passenger miles traveled would be served by on-demand, autonomous, electric vehicles owned by fleets. The impact would be an 80% reduction in transportation energy demand, a 90% reduction in tailpipe emissions, \$1 trillion in household savings, and more than 200 million cars taken off American roads.”

These startling conclusions need to be better understood by Massachusetts policy makers—and preparations need to be made to ensure that sustainable private-public partnerships exist to share the financial and social benefits of these new technologies.

### **Conclusion**

As a taxpayer and resident, I want my children to be safe, to grow up happy and healthy, to have good educational opportunities, and ultimately to have better opportunities than I've had. I was also dismayed at the comments by Undersecretary Ismay about "breaking wills" and "turning screws" on ordinary residents in order to combat climate change. His comments also revealed a fundamental misunderstanding of the role of technology disruption and its potential impact in the decade to come. The reality is we don't need massive technological breakthroughs, carbon taxes, or cuts in energy consumption.

But we do need to understand that other regions and countries see coming disruptions as a way to jump ahead. Because New England is made up of a multitude of states (ME, NH, VT, MA, RI, and CT), we need to find ways to work across state lines to deliver clean, affordable, and reliable electricity and energy in way that makes us a model globally. Even though electricity has been around for more than 100 years, there are still tens of millions of people that have no access, and others that experience sporadic access. With projected population increases in Africa over the next 80 years, we have to find ways to ensure economic development opportunities that aren't reliant on thousand-mile oil pipelines. We cannot and must not shy away from our responsibility as citizens of this country and of this Commonwealth in creating a new age of Freedom.

1. In 2018 the Greenfield subtractor concept was promulgated in SMART to actively discourage solar development on treed land. In 2020, EEA doubled down on that by increasing the “Greenfield Subtractor” to make solar development that cut trees uneconomic. All-natural cover comprises 73% of the land in Massachusetts.
  2. In 2020, EEA, without a public hearing, took the additional step of excluding, for solar development purposes only, any land in Core Habitat, (24% of state) Critical Natural Landscape(34% of state) or BioMap2 areas (40% of state). The state has no control over the 30,000 lots of 12-15 acres or more from any kind of development.
  3. The states in ISO-NE are all in the same avian and insect migratory pathways.
  4. The 2030 CECP and 2050 Roadmap, taken together (Roadmap) specifically exclude to a large extent large scale solar development in Massachusetts and thrust that development on other states.  
  
Massachusetts is doing wind, other states, you do solar.
  5. Great emphasis is placed in the Roadmap on Regional Energy Partnerships.
  6. What will other states think of their having to take their Core Habitat, Critical Natural Landscape and equivalent BioMap2 areas and devote those areas to solar development when they find out that Massachusetts wants to keep their state pristine while foisting Massachusetts compliance obligations on them? What will their voters and environmental groups think about that energy policy dichotomy? How will that dichotomy help the “Regional Partnership” northeast to Quebec and New Brunswick discussions?
- 

**Time allowing:**

1. How does the 2030 Roadmap inform the interconnection dockets DPU 19-55, DPU 20-75, and all the Grid Mod dockets while complying with 2016 c. 75 § 11 providing for continuous solar development across all sectors?

The Roadmap was written specifically excluding solar from any significant contribution to GWSA goals for twenty-years.

How does the 2030 Roadmap inform the doubling of electrical load and the integration DG on the accompanying heat map below? It does not.

