Leading by Example Council Agenda
January 16, 2023

- Welcome
- Climate News and Updates
- LBE Updates
- Fleet Electrification Tools
- Federal Tax Credits
- MA Decarbonization Policy Updates

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Welcome to the LBE Team!

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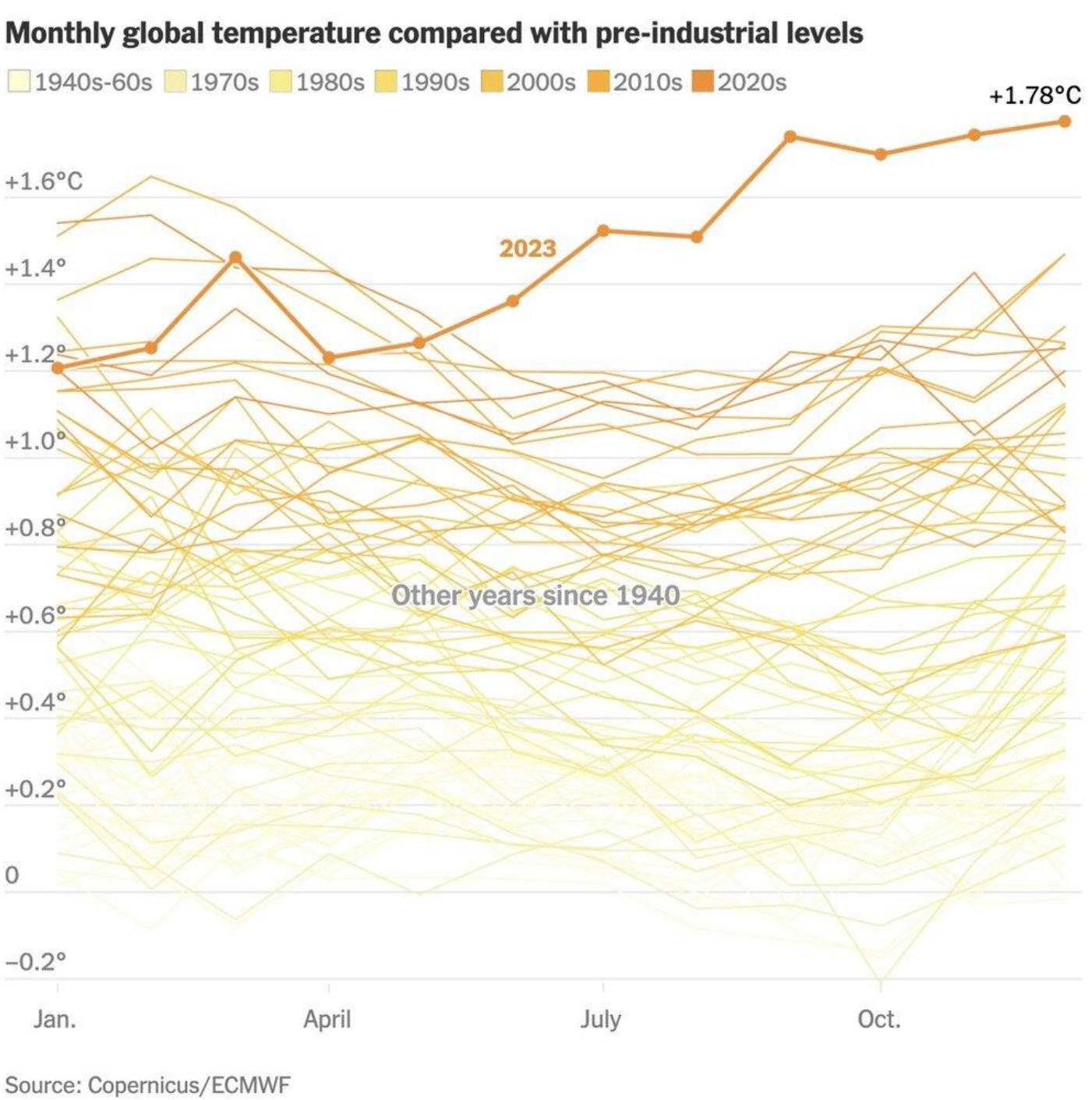
Temperatures are Looking Up…



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Climate News and Updates

And the Award for Best Globe Greening Goes To…

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Despite Troubling Headlines, Bright Horizons!

Manufacturing:

Boston Metal: creating steel with electricity

CarbonCure and Ecocem: low carbon cement manufacturing

Brimstone: carbon removal during cement making process

Electricity

Commonwealth Fusion: commercial fusion energy

TerraPower: next generation nuclear power plants

Transportation

Our Next Energy: EV battery that can run up to 600 miles

Fleet Zero: powering ships with batteries

Google, American Airlines, and Breakthrough Energy: study showing passenger planes can cut emissions in half if they make minor adjustments to their routes and fly several thousand feet lower

Buildings

Aeroseal: a polymer that seals ducts and other crevices in buildings

Luxwall: a window thin enough to replace single-pane glass without restructuring the frame but is much more efficient than single-pane glass

Source: www.gatesnotes.com

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Conference of Parties (COP)28 highlights

COP 28 was held last month and brought a new climate deal.

The climate deal …

- calls out fossil fuels for the first time ever
- Calls for countries to “transition away” from fossil fuels
- calls on countries to “contribute” to global efforts to reduce carbon pollution
- encourages carbon capture and storage

Photo Credit: Kiara Worth (UN Climate Change)

Source: www.cnn.com

IEA Updates Net Zero Roadmap, 1.5 Degree Limit Still Possible

Photo Credit: International Energy Agency

The 2023 IEA report calls for 80% reduction in global emissions by 2050:

- Triple of renewable power capacity by 2030
- Double annual rate of energy efficiency improvements
- Increase EV and heat pump sales
- Reduce energy sector methane emissions by 75%
- Increase investments in emerging/developing economies
- Global cooperation to support phasing out of fossil fuels rather than reliance on carbon capture technologies

Source: www.environmenenergyleader.com

First Offshore Wind Delivering Power

Vineyard Wind has now deployed five turbines. On 1/2/24, the first turbine delivered 5MW of power to the grid (power for ~4,000 homes). Complete project (800MW) will be complete in 2024.

- Created 937 union jobs so far, double commitment of 500

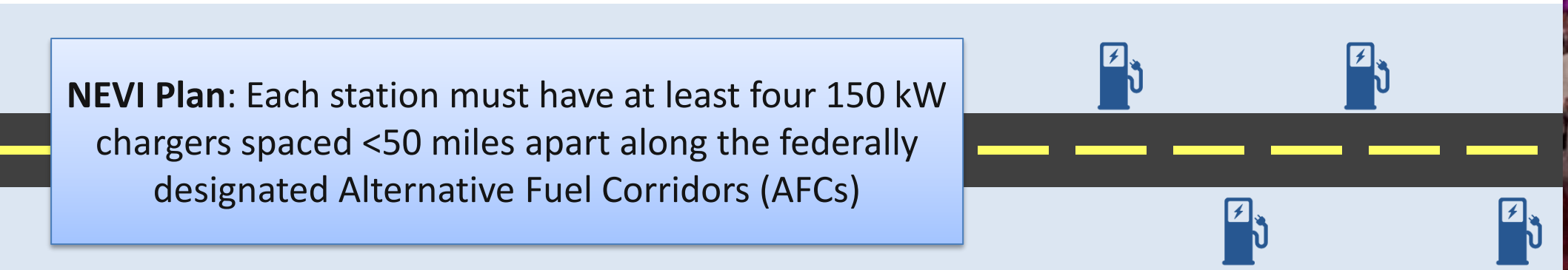
New York's South Fork Wind turbine installation began transmitting energy to Long Island from first turbine on 12/6/23. Complete project (130MW) to be complete in early 2024.

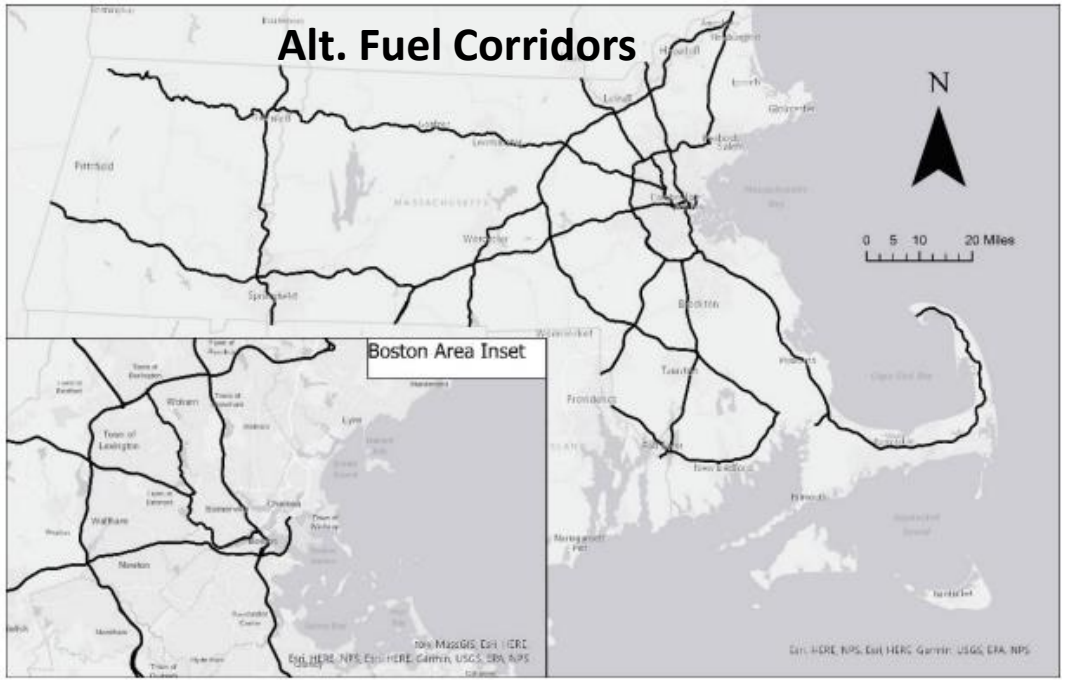
More wind to come! Current RFP for up to 3,600 MW; responses due Jan 31, 2024, projects selected June 2024

Photo Credit: Worldview Films

MA National EV Infrastructure (NEVI) Update

NEVI Plan: Each station must have at least four 150 kW chargers spaced <50 miles apart along the federally designated Alternative Fuel Corridors (AFCs)





- NEVI funds projected to support approximately **92 additional DCFC ports** along the AFCs to meet projected 2025 charging demand
- Priority zones focus on proximity to environmental justice and rural communities
- The DCFC stations must include both CCS and NACS connectors

Sources: mass.gov press release, NEVI Deployment Plan

Source: electrek.co

Tesla Chargers

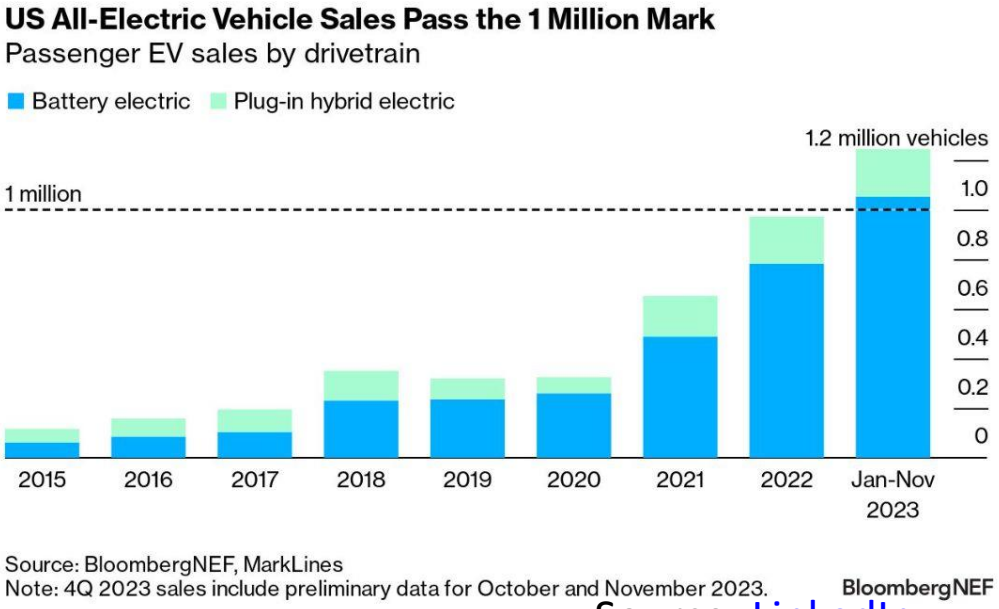
- In 2022, Tesla announced that it would open its charging network to non-Tesla vehicles
- GM and Ford EV owners could begin to take advantage of Tesla network as early as **this February**
- GM and Ford drivers can utilize already available Magic-Dock equipped Tesla superchargers or can procure a NACS-CCS adapter
- Starting in 2025, these and other EVs will be built with an NACS port
- Users will need the Tesla app to pay for use

Photo Credit: Tesla

Americans Bought 1 mil EVs in 2023

Source: www.cnn.com

- Americans purchased more than one million EVs in 2023, a 50.7% increase year-over-year
- 95 EV models now available in the US, a 40% increase over one year



Source: LinkedIn

Federal New Clean Vehicle Tax Credit Changes

Not applicable for commercially owned vehicles

Starting Jan 1, 2024:

- **Change 1:** Qualifying EVs cannot have any battery components from a country the federal government has deemed as a "foreign entity of concern". *Entity list can be found here.*
- **Change 2:** EV must be assembled in North America
- **Change 3:** Tax credit will start being available at the point of sale for participating dealerships
- **Manufacturers with eligible BEV models:**
  - Chevy
  - Ford
  - Rivian
  - Tesla

Source: www.npr.org

Photo Credit: www.fueleconomy.gov

New List of Eligible Vehicles for 2024 purchase or lease.

Make	Model	Model Year	Vehicle Type	Credit Amount	MSRP	Eligibility
Chevrolet						
	Bolt EUV	2022–2023	EV	$7,500		
	Bolt EV	2022–2023	EV	$7,500		
Chrysler						
	Pacifica PHEV	2022–2024	PHEV	$7,500	$80,000	Check VIN
Ford						
	Escape Plug-in Hybrid	2022–2024	PHEV	$3,750	$80,000	Check VIN
	F-150 Lightning (Extended Range Battery)	2022–2024	EV	$7,500	$80,000	Check VIN
	F-150 Lightning (Standard Range Battery)	2022–2024	EV	$7,500	$80,000	Check VIN
Jeep						
	Grand Cherokee PHEV 4xe	2022–2024	PHEV	$3,750	$80,000	Check VIN
	Wrangler PHEV 4xe	2022–2024	PHEV	$3,750	$80,000	Check VIN
Lincoln						
	Corsair Grand Touring	2022–2024	PHEV	$3,750	$80,000	Check VIN
Rivian						
	R1S Dual Large	2023–2024	EV	$3,750	$80,000	Check VIN
	R1S Quad Large	2023–2024	EV	$3,750	$80,000	Check VIN
	R1T Dual Large	2023–2024	EV	$3,750	$80,000	Check VIN
	R1T Dual Max	2023–2024	EV	$3,750	$80,000	Check VIN
	R1T Quad Large	2023–2024	EV	$3,750	$80,000	Check VIN
Tesla						
	Model 3 Performance	2023–2024	EV	$7,500	$55,000	Check VIN
	Model X Long Range	2023–2024	EV	$7,500	$80,000	Check VIN
	Model Y All-Wheel Drive	2023–2024	EV	$7,500	$80,000	Check VIN
	Model Y Performance	2023–2024	EV	$7,500	$80,000	Check VIN
	Model Y Rear-Wheel Drive	2024	EV	$7,500	$80,000	Check VIN

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Electrify Your Snow Maintenance!

While battery-powered snow maintenance equipment is currently limited, some models on statewide contract FAC116 may suit facility needs

SHERPA 100 ECO
- 30-in wide skid-steer
- Runs for 4-7 hours
- ~$45,000

KRESS Two-Stage Blower
- 24-in wide
- Runs ~70 minutes
- Interchangeable batteries
- ~$1,800

TORO Two-Stage Blower
- 26-in wide
- Runs ~70 minutes
- Interchangeable batteries
- ~$1,800

Kovaco Elise 900
- 74-in wide plow
- Runs for 5-8 hours
- ~$80,000

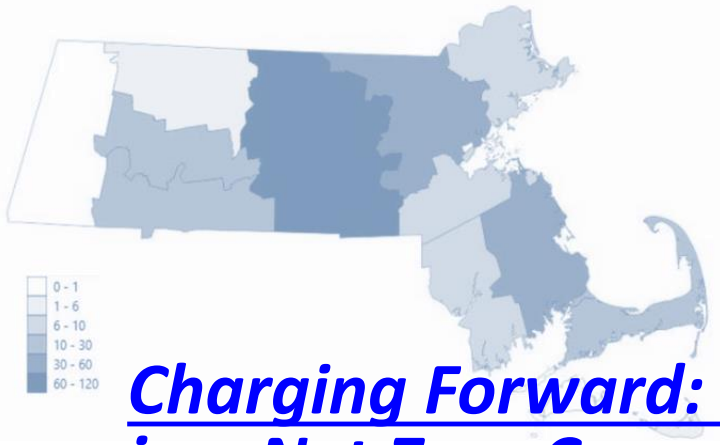
Shovel
- Multiple sizes!
- Runs as long as you can!
- $10-30?

BESS in Action During Cape Cod Storm Outage

Eversource's large-scale Outer Cape Battery Energy Storage System (25 MW / 38 MWh) is designed to provide immediate backup power to customers along the single 13-mile power line that runs from Wellfleet to Provincetown

During the December 18th storm, the Outer Cape system deployed to provide backup power for ~5,600 customers in Provincetown

Sources: Eversource, Provincetown Independent



DOER Energy Storage Study

Charging Forward: Energy Storage in a Net Zero Commonwealth has been released!

- One of the Report's key findings is the **deployment and use of energy storage systems is a critical and cost-effective strategy** for the Commonwealth to encourage in meeting its goals under the 2050 CECP

DOER invites public comment on its recommendations until **Wednesday, January 31, 2024**. Please submit comments via email to **thomas.ferguson@mass.gov**.

To incentivize storage deployment, DOER proposes:

- Procurements or other mechanisms for incentivizing storage deployment
- Creating refined interim targets for energy storage deployment that connect the targets to renewable generation deployment
- Reviewing existing programs that incentivize storage, including the CPS
- Continued stakeholder collaboration on other issues impacting energy storage deployment

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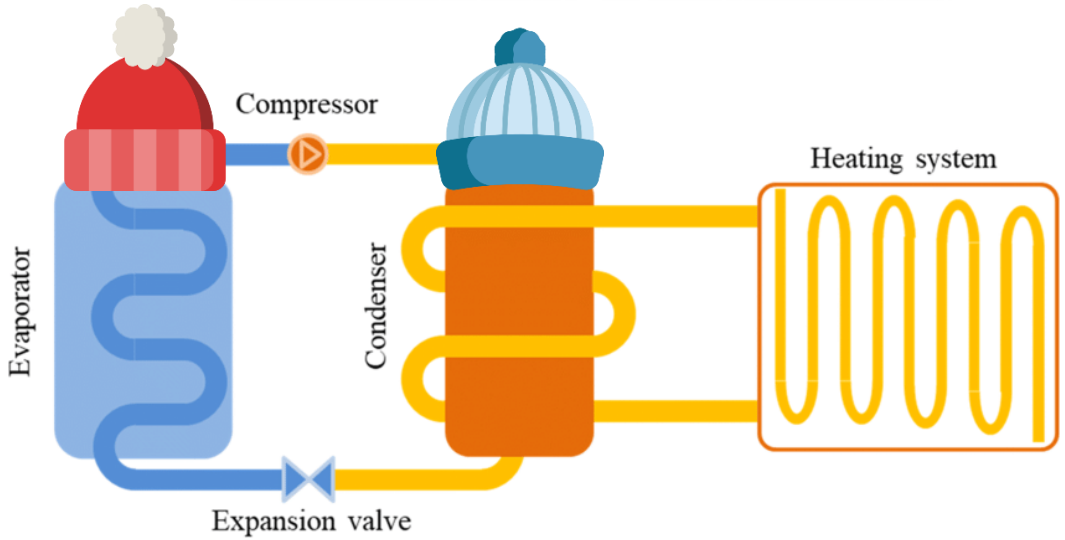
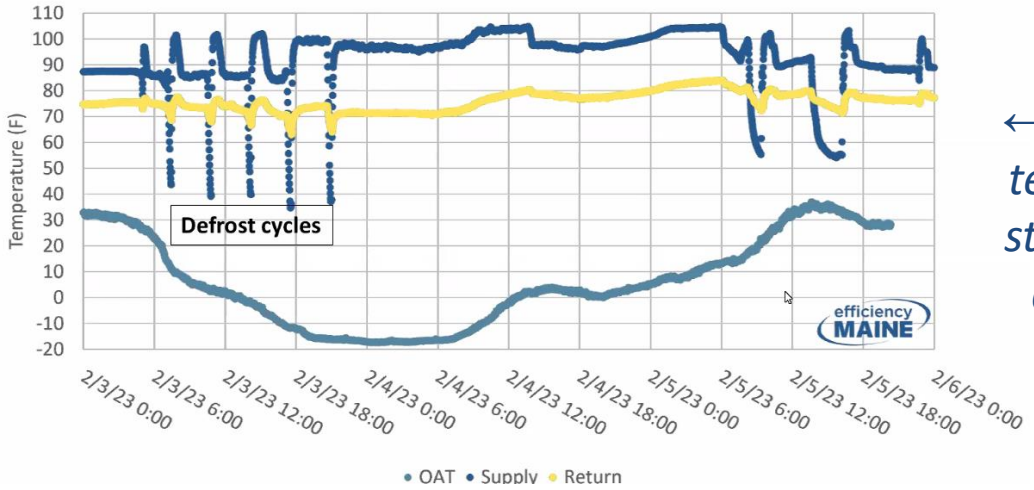
MYTHBUSTERS: ASHPs and Extreme Cold Weather

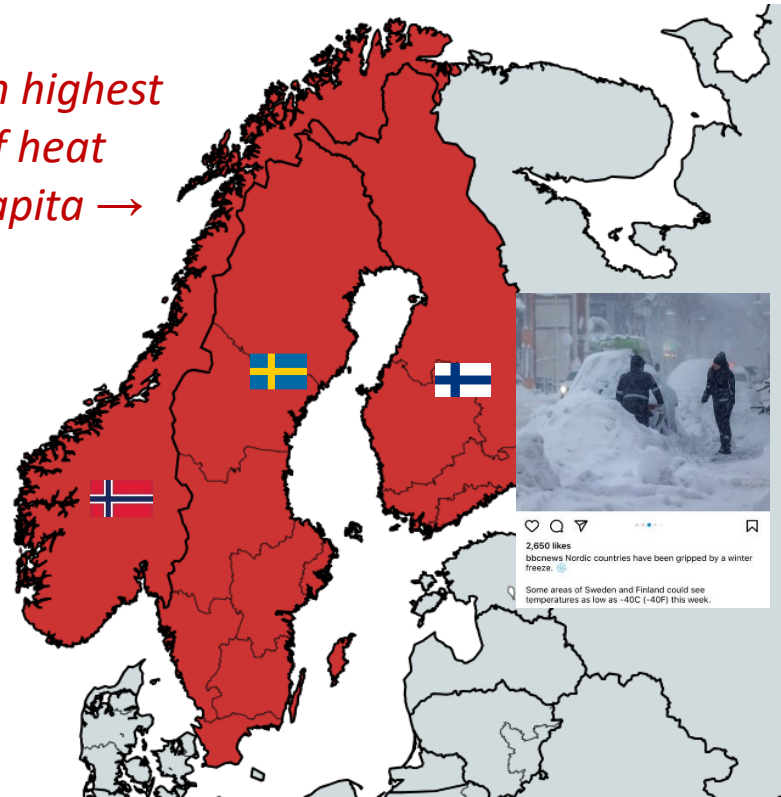


Cold-climate heat pumps can be up to twice as efficient as electric-resistance heating when outdoor temperatures fall to -30°C



←At –16-degree outdoor temps last winter, ASHPs still providing 90- to 100-degree heat in Maine!

Countries with highest numbers of heat pumps per capita →



Sources: Efficiency Maine, EuroNews

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Survey: Which of the technologies referenced are you most interested in learning more about at a future LBEC meeting?

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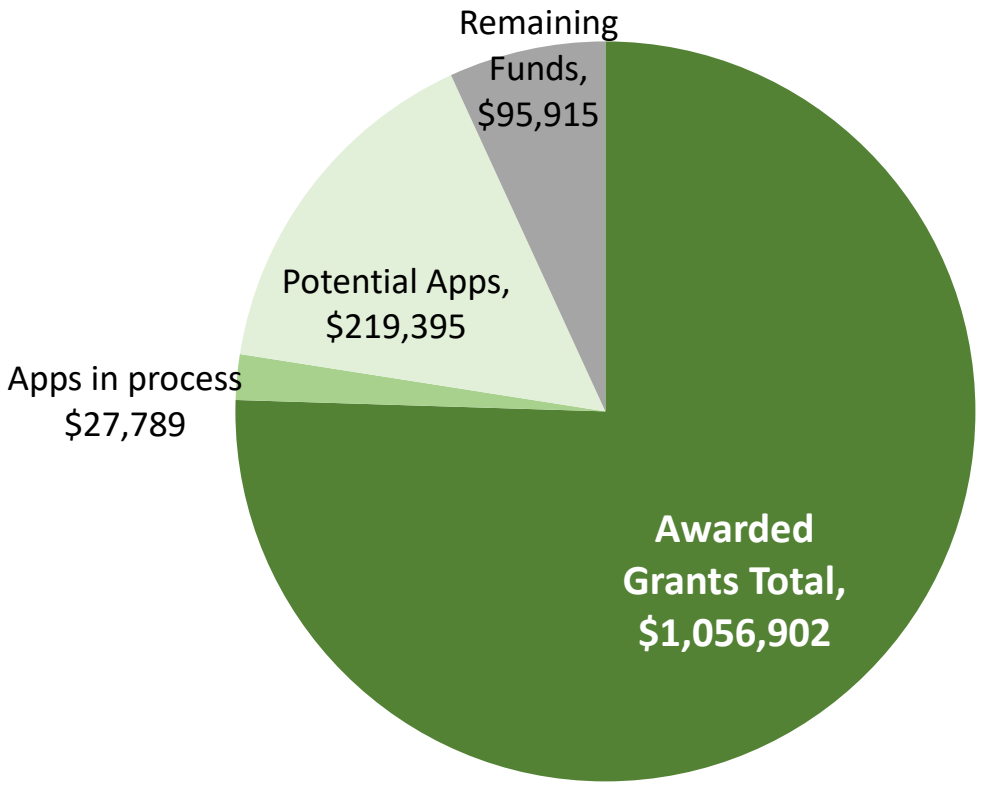
Fleet EVSE Grant Update

We hit our EO594 EVSE target 18 months early!

371 charging stations installed as of December 2023

- 109 ports (61 stations) funded across 20 locations
- Equipment (e.g., stations) account for ~25% of project cost
- Installation accounts for ~75% of cost



Agency	# Ports	Cost per port	% of project covered by grant
UMA	30	$6,549	89%
MIL (*incl 4 pre-wired*)	4	$28,993	100%
DMF	4	$11,569	100%
DOS	2	$13,070	100%
DFW	4	$7,130	100%
UMass Chan	16	$13,917	56%
BSU (*incl 2 pre-wired*)	4	$36,506	68%
Plymouth MCP	8	$3,678	100%
DCR (*L2+ L1*)	23	$7,560	100%
Cape Cod MCP	4	$17,825	100%
DPH *(incl 3 pre-wired)*	4	$17,129	100%
DFS *(incl 6 pre-wired)*	6	$16,146	100%

2023 LBE Recognition Award Winners

Municipal

City of Lowell

Town of Windsor

Individuals

Hope Davis, DCAMM

Suzanne Wood, UMass Chan

Hank Haff, Needham

State Entities

MWRA

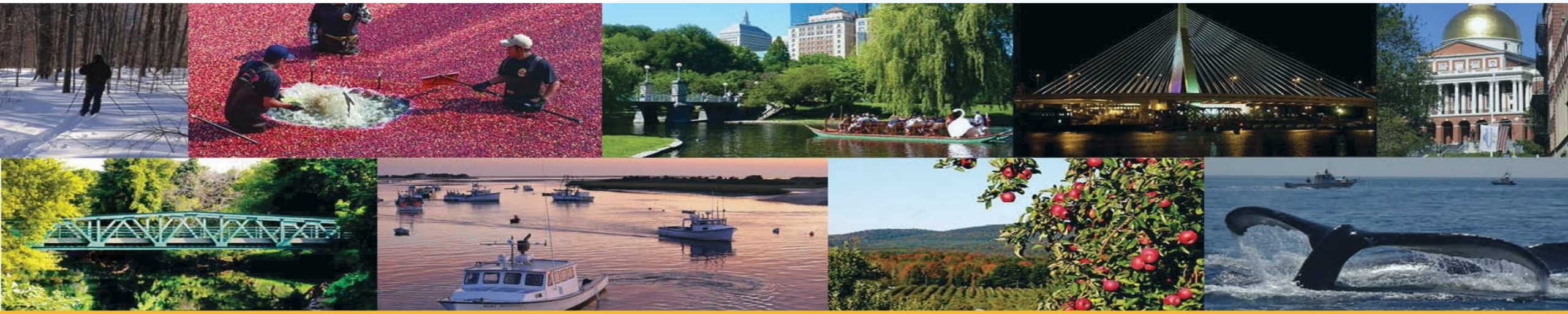
MassBay Community College

DCR Net Zero Task Force

OPERATIONAL SERVICES DIVISION

OSD Contract Updates

Julia Wolfe
1/16/24



Renewals

- TRD01: Boilers; Drains; Electrical; Fencing; General Contracting; Generator/Turbine; Glass/Window/Doors; HVAC/Sheet Metal; Painting; Plumbing Solar Array Inspection, Repair Services' will be renewed through 4/1/27

- VEH110: Light and Medium-Duty Vehicles - added a two-year extension for existing vendors and added *new vendor DATTCO Inc (dba DeVivo) into Cat 11: School Buses and 7D Vehicle*.

- FAC86: Solid Waste and Recycling: a number of vendors renewed for 3 additional years

New Contracts Live Now

OPERATIONAL SERVICES DIVISION

Contract	Categories
FAC120: Landscaping Services, Snow Removal, Tree Services and Related Services	Category 1: Landscaping and Grounds Keeping Services Category 2: Snow Removal Services Category 3: Tree Services Category 4: Invasive and Exotic Plant Control Services Category 5: Outdoor Integrated Pest Management Services Category 6: Irrigation System Service and Repair
FAC122: Parks & Recreation Equipment & Related Products, Supplies & Services	Category 1: Live Plants, Seeds, and Other Nursery Products Category 2: Turf and Ornamental Landscape Products Category 3: Soil, Compost, Mulch, and Biochar Category 4: Soil Aggregate Products Category 5: Fertilizer, Including Organic Category 6: Playground Equipment Category 7: Playground and Outdoor Athletic Surfaces Category 8: Site Furnishings/Amenities Category 9: Sport and Fitness Equipment Category 10: Outdoor Shelter/Shade Structures Category 11: Splash Pads and Water Play Category 12: Parks and Recreation Installation and Maintenance Category 13: Fencing, Railing, Decking, Partitions and Lockers Category 14: Related Specialty Environmentally Preferable Products (EPP)
FAC124: Building Maintenance Repair and Operations, Project Materials and Supplies - new contract started 10/1/23 and reopened to add additional vendors to all categories and will remain open through March 2024. The SST is particularly seeking vendors for lumber and metal under Category 5. COMMBUYS Bid BD-24-1080-OSD03-SRC3-94361.	Category 1: Electrical and Lighting Products and Supplies Category 2: LED Roadway and Outdoor Area Lighting Category 3: Plumbing and Heating Products and Supplies Category 4: HVAC and Refrigeration Products and Supplies Category 5: Building Envelope and Related Materials: Roofing Products and Supplies, Lumber Products and Supplies, Envelope systems products and supplies, Cement and Masonry Products and Supplies, Paint Product and Supplies, Ceiling tiles and components, Doors and Hardware , Window Components and Hardware, Drywall & Drywall Components, Building Metal Materials and Components, Other Building Envelope and Related Materials

Rebidding in Progress

- **PFR74: Energy, Climate Action and Facility Advisory Services** - has been reopened: BD-24-1080-OSD03-OSD03-96272 (bids due 2/13/24)
- **FAC98: Floor Coverings and Accessories, Floor Covering Installation, Maintenance and Repair** - in the process of being rebid for new a new contract with anticipated new contract start date 6/30/25
- **FAC101: Facilities MRO Industrial Supplies** - will become FAC123 - anticipated new contract start date is 6/30/24
- **FAC109: Renewable & Alternative Energy Portfolio Standards** allowed to expire on 03/30/2024. It will be replaced by Statewide Contract FAC128: Renewable & Alternative Energy Portfolio Standards and anticipated new contract start date is 04/01/2024 (note that this may change to an ENE contract).
- **OFF38: Office, School and Library Furniture, Accessories & Services Affordable Interior Systems** will be allowed to expire on 04/14/2024. It will be replaced by a new Statewide Contract OFF52 Office, School and Library Furniture and Accessories and Services with an effective date of 04/15/2024. COMMBUYS Bid # BD-24-1080-OSD03-OSD03- 95255 (bids due 2/7/24).
- **OFF47: Office Supplies, Recycled Paper and Envelopes** will be allowed to expire on 03/31/2024. It will be replaced by a new Statewide Contract OFF53 Office Supplies, Recycled Paper, and Envelopes, COMMBUYS Bid # BD-24-1080-OSD03-OSD03-92740 (bids due Jan 24th) with an effective start date of 04/01/2024.

MassDEP MD/HD Reporting

- MassDEP passed a new regulation in Sept. 2023 that requires public entities to do **one-time reporting of all medium- and heavy-duty vehicles** in their fleet
- Applies to:
  - Fleets with 1 or more MD/HD assets
  - MD/HD = GVWR > 8,500 lbs
- Reporting due: **Friday, March 1 by 5 pm**
  - Submit via Large Entity Reporting portal
  - Contact Sophia (sophia.vitello@mass.gov) if you would like support for reporting

For more information, visit MassDEP reporting page here

Source: Flickr


Source: Flickr


Source: Ford

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Fleet Electrification Planning

Fleets & EVs & Charging – Oh my!

- Working to electrify your entity's fleet but not sure how to plan for it?
  - Reach out to LBE & we can connect you to some helpful fleet electrification planning resources, including:
    - Utility Fleet Advisory Services
    - MassCEC Fleet Advisor
    - DRVE Fleet Analysis Tool

Stay tuned for an LBE webinar on fleet electrification planning!

Details coming soon

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Investor-owned Utility Fleet Advisory Services

Free fleet advisory services offered by **National Grid & Eversource** to develop fleet electrification plans

- Plans can include:
  - Total cost of ownership analysis
  - Fuel cost & emissions comparison of existing conventional fleet vehicles & EVs
  - Charging infrastructure recommendations
  - EV acquisition plan based on existing fleet vehicle retirement schedules & projected savings

MassCEC: Mass Fleet Advisor

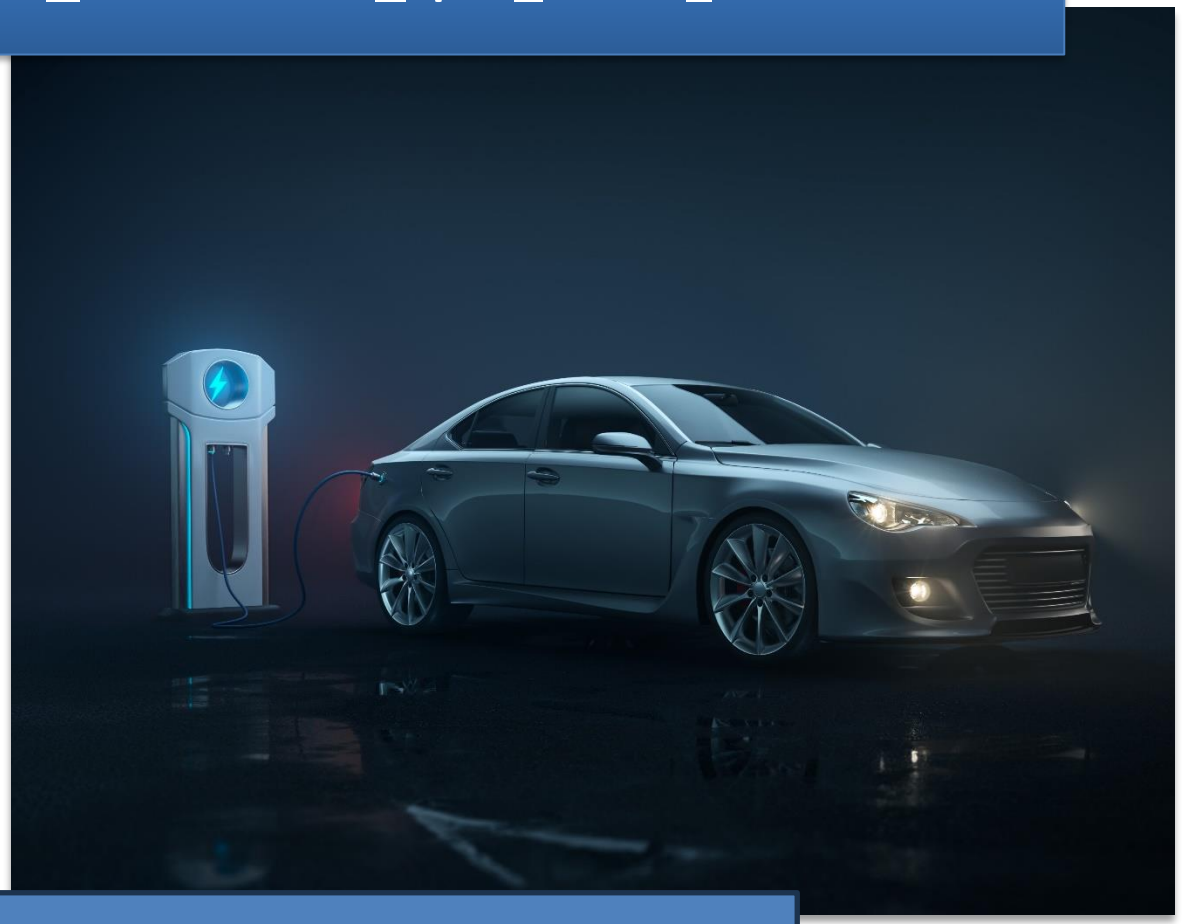
- Mass Fleet Advisor will work with eligible fleets (at least one MD or HD vehicle) to better plan concrete steps towards fleet electrification
- Up to 65 participating fleets will receive:
  - Cost savings and emission savings modeling
  - Guidance on data collection to evaluate the best options for your fleet
  - A virtual site assessment to help you understand your infrastructure needs
  - A Fleet Electrification Report that summarizes vehicle options, projected costs, site infrastructure & support needs, and recommendations for next steps

Soon to be available to public fleets in Municipal Light Plants and any fleet with medium- and heavy-duty assets not eligible for Eversource or National Grid's advisory services

What is the DRVE tool & what can it do?

- Free tool funded by Electrification Coalition and developed by Atlas Public Policy; analysis performed by LBE
- Compares total cost of ownership of conventional ICE vehicles in existing fleet with potential EV alternatives
- Flags priority vehicles in the fleet for near-term electrification based on age, mileage and positive EV savings
  - Provides potential savings from specific EV models, including cost per mile breakdown
- Supports customizable settings such as inclusion of state & federal EV incentives (e.g., MassEVIP, MOR-EV Trucks, IRA credits)

"Dashboard for Rapid Vehicle Electrification"



Contact Sophia if you are interested in a DRVE fleet analysis (sophia.vitello@mass.gov)

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Federal Tax Credits for Decarbonization

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179D: Energy Efficient Commercial Building Deduction

- 2022 Inflation Reduction Act modified the Energy Policy Act
- Provides up to $5/sq ft for envelope improvements, HVAC, and lighting efficiency
- Tax deduction can be allocated to the architect, with savings passed on to building owners

Theoretical Scenario

- 100,000sq ft building reduces energy use by 50%
- Project qualifies for $5/sq ft rate: $500,000
- 10% allocated to third-party verifier
- $450,000 split between owner and architect based on pre-determined agreement

We are investigating how this could work in Massachusetts…more to come!

Compliance Path		Savings Requirement	Tax Deduction			
			taxable years before 2021	taxable year beginning 2021	taxable year beginning 2022	taxable year beginning 2023*
Fully Qualifying Property		25%	na	na	na	$2.5/ft^2
		50%	$1.80/ft^2	$1.82/ft^2	$1.88/ft^2	$5.00/ft^2
Partially Qualifying Property	Envelope	10%	$0.60/ft2	$0.61/ft2	$0.63/ft2	na
	HVAC and HW	15%				
	Lighting	25%				
Interim Lighting Rule		25% - 40% lower lighting power density (50% for warehouses)	$0.60/ft2	$0.61/ft2	$0.63/ft2	na

**with prevailing wages*

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Clean Energy Direct Pay Tax Incentives

In 2025, the eligibility requirements for projects under these credits will become technology neutral

TAX PROVISION	ELIGIBLE PROJECTS	BASE CREDIT	CREDIT ADDERS
Production Tax Credit For Electricity From Renewables	Facilities generating electricity from wind, biomass, geothermal, solar, small irrigation, landfill and trash, hydropower, and marine and hydrokinetic renewable energy.	0.55 cents/kWh, (2.75 cents/kWh with prevailing wage)	5x base credit if prevailing wage and apprenticeship requirements met 10% if domestic content requirements met 10% if project located in an energy community
Investment Tax Credit for Energy Property	Fuel cell, solar, geothermal, small wind, energy storage, biogas, microgrid controllers, and combined heat and power properties.	6% of qualified investment (basis of energy property) and 30% with prevailing wage	**Only for ITC:** 10% if project located in a low-income community or on tribal land

Source

PTC and ITC Scenarios for Solar Canopy

An analysis by WRI determined that the ITC is likely to be more profitable than the PTC for smaller projects (WRI IRA Roadmap)

Sample numbers: Solar canopy with capacity of 636kW DC[a] , projected generation of about 700,000 kWh, and total cost of $1.9 million[a]

ITC	Credit Value	% of project cost covered by credit
Credit with prevailing wage	$588,689	30%
+ Domestic content	$784,918	40%
+ Energy community	$981,148	50%
+ Low-income community	$1,177,378	60%

[a] The total cost of the project, the system size, and the projected energy generation is based on data submitted to LBE.

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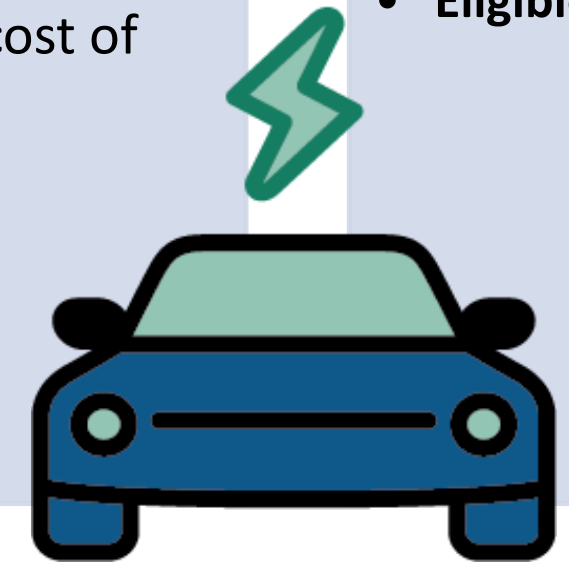
Clean Energy Tax Incentives: Commercial Clean Vehicle Credit

The credit amount equals the lesser of:

- 30% of the purchase price if the vehicle is not powered by gas or diesel

or

- The incremental cost of the vehicle



Maximum credit allowed:

- $7,500 for vehicles <14,000 pounds
- $40,000 for vehicles >14,000 pounds
- **Eligible for Direct Pay**

Additional criteria:

- Includes passenger vehicles, buses, ambulances, and certain other vehicles for use on public streets, roads, and highways
- Must meet battery requirements
  - 7 kWh or 15 kWh depending on vehicle weight
- Fuel cell motor vehicle requirements
- Must be from a qualified manufacturer

More Information

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Commercial Vehicle Tax Credit Scenarios

These scenarios are for state owned vehicles that would qualify for the Commercial Vehicle Credit, not the new clean vehicle credit for individuals

Vehicle	GVWR	Starting Purchase Price	Federal Credit	MOR-EV Truck Credit	Full Credit	Percent vehicle cost covered
Ford Mustang Mach-E	5,800lbs	$33,299[a] - $55,000[b]	$7,500	N/A	$7,500	13% - 22%
Ford F-150 Lightning	8,250lbs – 8,550lbs	$43,983[a] - $80,000[b]	$7,500	$7,500	$15,000	18% - 34%
Thomas Built Buses Saf-T-Liner C2	33,000lbs	$368,596	$40,000	$75,000	$115,000	31%

[a] Based on the purchase prices seen in MOR-EV program.
[b] Based on the MOR-EV program price cap.

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The Pre-Filing Registration Portal is Open!

- There is pre-filing guidance available
  - IRS Pre-Filing Guidance Document (irs.gov)
- Key takeaways:
  - Taxable year is based on fiscal year/annual accounting period
  - "Tax filing" deadline is 4.5 months after the end of taxable year
  - Eligible projects previously completed may be eligible – LBE is still identifying the eligibility date boundaries
  - Pre-filing registration is required
    - IRS recommends pre-filing at least 120 days before your "tax filing" date

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Look Forward to More Guidance Soon

There is a lot to understand here. LBE will work on delivering more information. In the meantime, here are some helpful links:

- IRS Pre-Filing Guidance Document (irs.gov)
- Elective Pay and Transferability Frequently Asked Questions: Elective Pay | Internal Revenue Service (irs.gov)
- Elective Pay Tax Credit Overview (irs.gov)
- WRI IRA Roadmap

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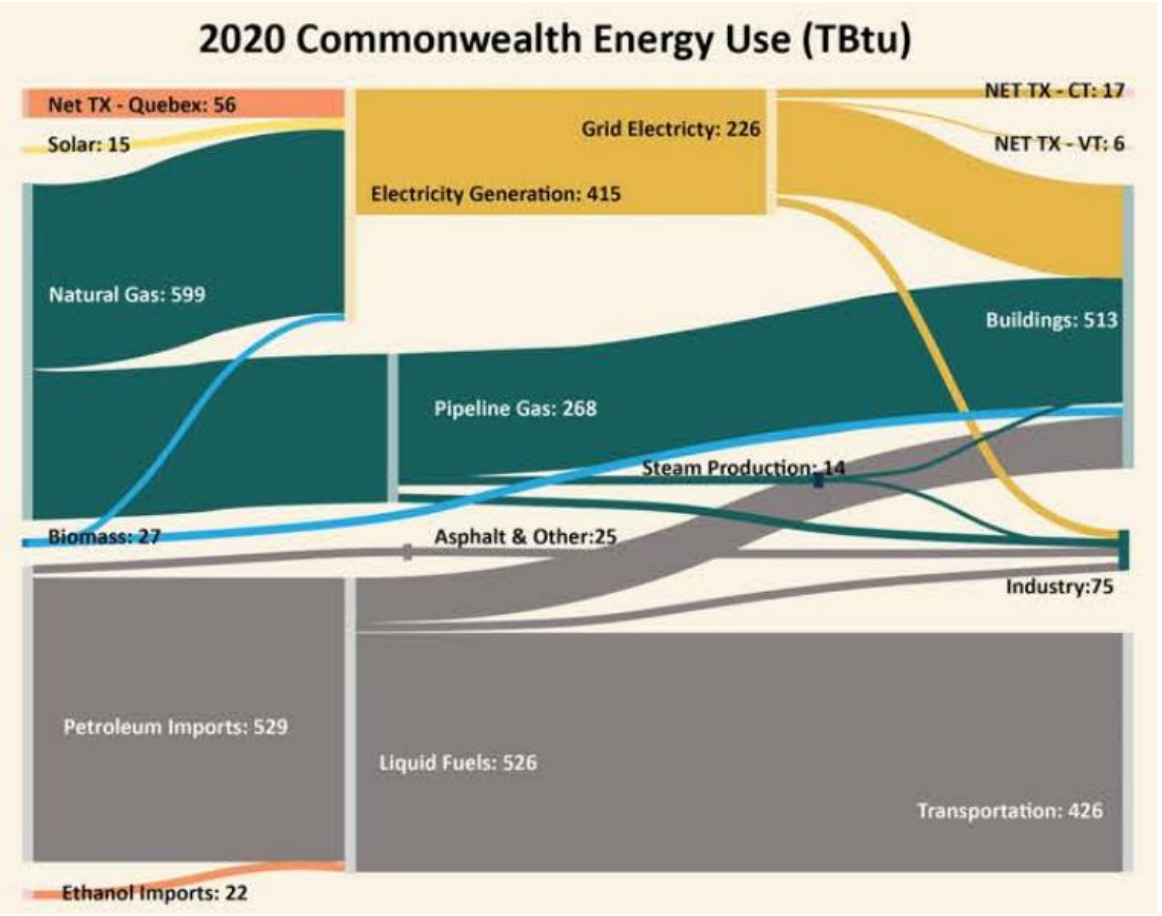
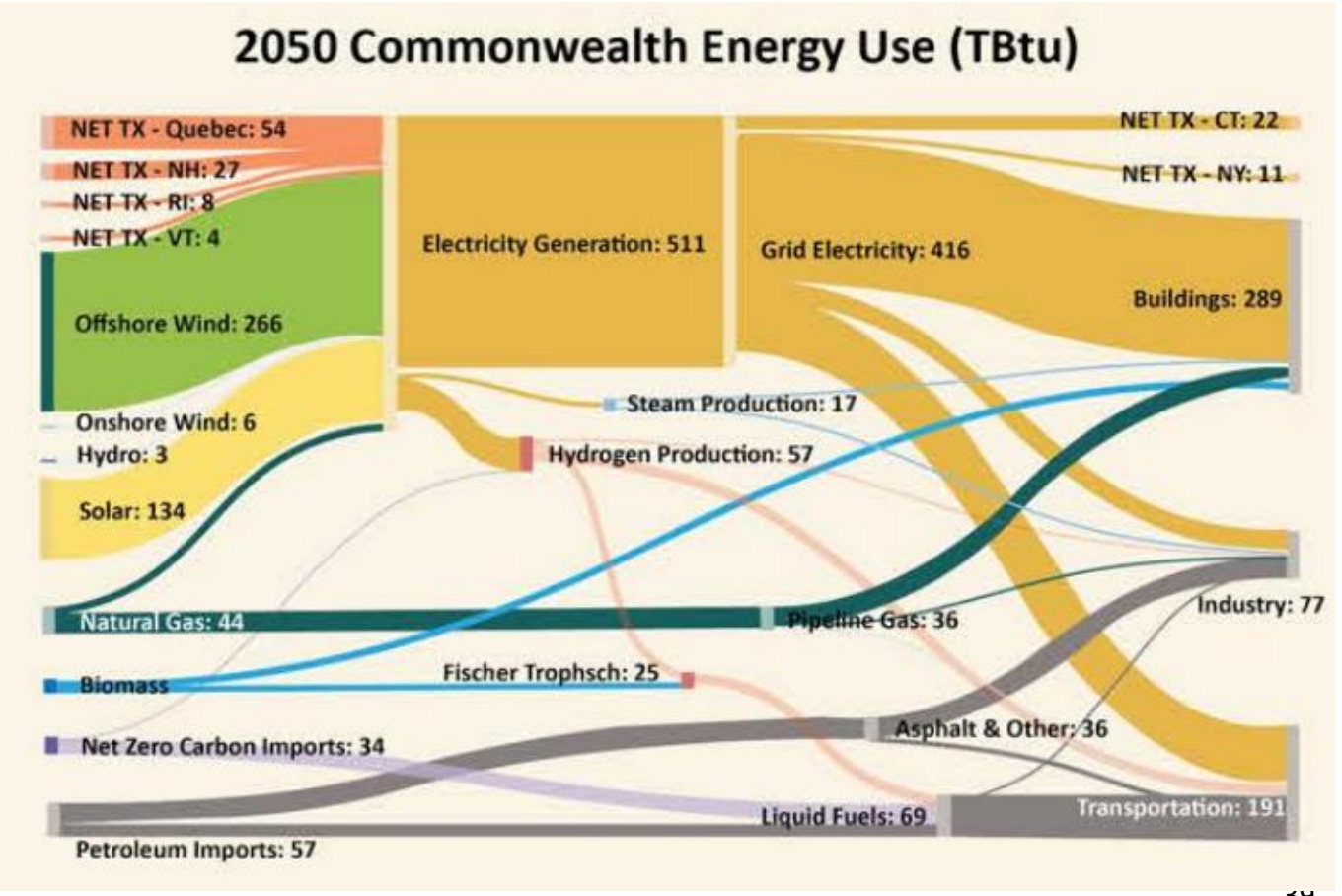
Decarbonization in the Commonwealth:

Policy Updates

2020 vs 2050 Energy Use

To achieve net-zero by 2050, natural gas use must be almost entirely replaced with grid electricity



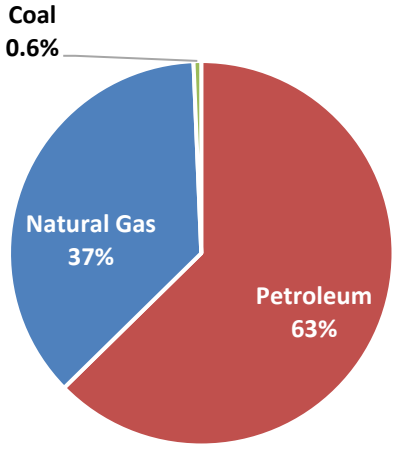


Source: EEA 2050 Roadmap

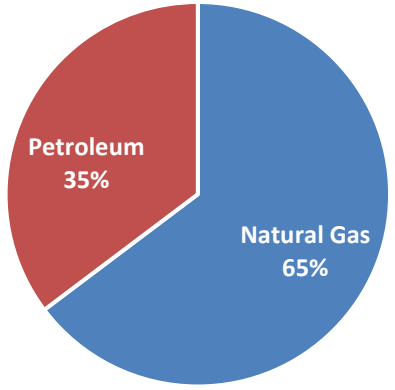
Transitioning from Natural Gas: Progress

- As the Climate Report Card outlines, the buildings sector is currently on track or leading in all categories as compared to expectations and modeled analytics, but significant, new interventions are needed to meet upcoming 2025 and 2030 targets
- Building emissions from natural gas have grown significantly as a proportion of building heating emissions and now constitute 65% of building emissions

1990 Residential & Commercial Sector CO_2 Emissions



2020 Residential & Commercial Sector CO_2 Emissions



Sources: OCIR Climate Report Card, MA Clean Energy & Climate Metrics Dashboard, 2050 CECP, MassDEP GHG Inventory

*2020 is the most recent full dataset of MassDEP GHG inventory

Transitioning from Gas is Challenging!

- Need for policies and incentives to align with statewide goals
- Natural gas is still cheap
- Transition requires adoption of entirely new technologies
- Transition will also require significant upgrades and improvements to electric grid
- Public perception of heat pumps needs to be overcome
- Massachusetts is working on an array of programs and policies that will support this transition over time

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DEPARTMENT OF ENERGY RESOURCES
Elizabeth Mahony, Commissioner

Summary:
DPU Order 20-80B

January 16, 2024

Internal Policy Deliberative

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Outline

I. Background
II. High-Level Directives of the Order
III. Recommended DOER Policy Implications from the Order
IV. Questions/Discussions

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Background

- Investigation into the Future of Gas was opened in June 2020
- The LDCs presented the Department with 8 potential decarbonization pathways to achieve 90% gross reduction in GHG emissions by 2050
  - ➢ DOER provided two sets of comments (5/2022 and 10/22)
- On December 6, 2023, the Department issued the 20-80-B Order
- The Department's findings were based on its desire to promote a regulatory framework that is:
  - ❑ Flexible
  - ❑ Protects Consumers
  - ❑ Promotes Equity
  - ❑ Provides fair consideration of current and future technologies and applications required to meet the Commonwealth's clean energy goals

Overview

The Department's positions in Order 20-80B reflect the following:

- The need for a significant increase in the use of electrified and decarbonized heating technologies
- LDC must explore opportunities for strategic and targeted decommissioning of portions of their service territory
  - Requirement for Demonstration Projects (electrification and thermal technologies)
- There must be an enhancement in incentives and the expansion of Mass Save EE programs to facilitate use of heat pumps
- There is a need to minimize costs for customers through outside sources and workforce development

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Overview (Con't)

- Rather than enhancing their existing gas systems, LDCs will be required to examine Non-gas Pipe Alternatives (NPAs)
  - Thermal Networked Systems
  - Targeted Energy Efficiency
  - Demand Response
- LDCs will have the burden to demonstrate they considered NPAs as a condition of recovering additional investments in pipeline and distribution mains

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Overview (Cont'd)

- The Department will not change its gas supply procurement policy to include RNG to LDC supply portfolios due to cost, lack of availability, and RNG's status as zero-emissions fuel
  - Customers can purchase RNG from the LDC at their own cost
- Hydrogen blending, like RNG, is unproven in its ability to lead to reductions in GHG emissions
  - Infrastructure costs associated with Hydrogen will be the responsibility of the utility
- LDCs must conduct a comprehensive review that includes a forecast of the magnitude of stranded investments
  - Investigation into cost recovery of existing infrastructure and investment is required

Directives from the Order

Climate Compliance Plans:

- Must be filed every five years; First plans due on or before 4/1/25
- Should expand on the Net-Zero Enablement Plans previously filed in the 20-80 investigation
- Each Climate Compliance Plan should:
  - Demonstrate how the LDC proposes to contribute to the prescribed GHG emissions reduction sublimits set by EEA for both Scope 1 and Scope 2 emissions
  - Demonstrate how the LDC will satisfy customer demand safely, reliably, affordably, and equitably using known and market-ready technology
  - Use pilot or demonstration projects to assist in identifying investment alternatives
  - Incorporate the evolution of previous metrics
  - Implement recommendations for future plans

Directives from the Order (cont'd)

Climate Compliance Incentives:

- Existing PBR framework should be amended to establish incentives and disincentives reflecting the gas utility's progress toward compliance with the Climate Act mandates, and achievement of their Climate Compliance Plans
  - LDCs must propose climate compliance performance metrics in their next PBR filings

Directives from the Order (cont'd)

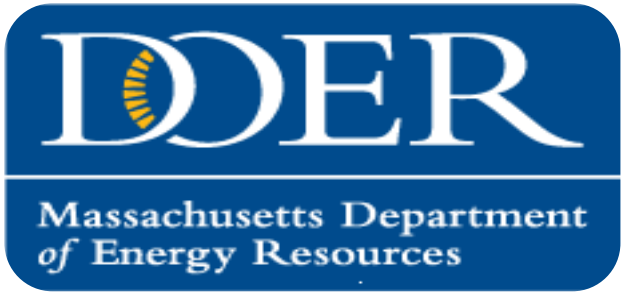
Investigation into affordability (DPU 24-15):

- The DPU has initiated an investigation into current methods to address residential affordability
  - Low-income discount rates
  - Arrearage management plans (AMPs) – provides arrearage forgiveness for customers who meet certain criteria
  - Disconnection protection
  - Percentage of income payment plans

Questions/Discussion

Massachusetts Department of Energy Resources

Creating A Clean, Affordable, Equitable and Resilient Energy Future For the Commonwealth



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2025-2027 Massachusetts Energy Efficiency Plan

JoAnn Bodemer
Director of Energy Efficiency
January, 2024

The Broadening of the GCA through Legislative Amendments

- 2018 Act to Advance Clean Energy Future
  - **Directed plans to include emission reducing measures** such as "strategic electrification"
  - Authorized the energy efficiency plans to promote "customers switching to renewable energy sources or other clean energy technologies"
- 2021 Climate Act
  - **Establishes new mandates for GHG emissions**
  - Directs EEA secretary to set a GHG emissions reduction goal for the three-year energy efficiency plans
- 2022 Act Driving Clean Energy and Offshore Wind
  - **Eliminates incentives for fossil fuel equipment**, except for income eligible and other limited uses beginning in 2025 and prioritizes equity in the delivery of energy efficiency programs

Other changes impacting the Three-Year Plans

- The 2022 Act accelerates the planning process, requires first draft of Plan to be developed by March 31 rather than April 30

- The 2022 Dept. of Energy rule on Lighting Standards prohibit the sale of nearly all residential incandescent and halogen lamps - fully effective for retail sales starting August 1, 2023

Where are we in the 2025-2027 Planning Process

- 2024 is the last year of the current three-year plan and the final phase for 2025-2027 planning

- The EEAC has completed its workshop process and made its initial recommendations for the 2025-2027 Three-Year Plan

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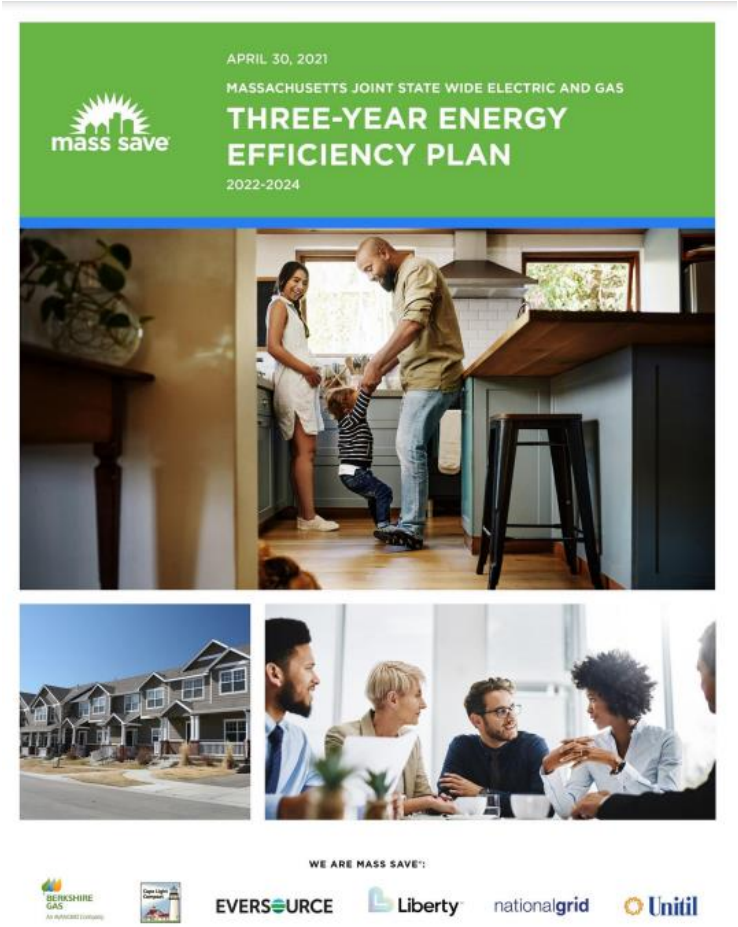
What are the next steps?

- DOER and other key stakeholders continue to work with the PAs in the development of the 2025-2027 Plan
- The PAs potential studies, assessing the energy savings potential over the three-year timeframe, will be finalized in January
- The Avoided Energy Supply Cost Study, a regional study prepared every three years will be completed in January
  - Provides values for input into the cost-effectiveness screening tool
  - Social Cost of Greenhouse Gas
- EEA Secretary will issue the Plan GHG Goals on March 1
- PAs will file the 2025-2027 Draft Plan on March 29

After the draft Plan



- From April-June, EEAC will review draft plan and make final recommendations to the PAs by July 1
- DOER is planning Public Listening Sessions to be held in the spring, after the draft plan is filed to allow for public comment
- From Aug-Oct, the PAs will refine and finalize the plan for filing with the DPU
- The DPU will open adjudicatory proceedings to review the plans and issue its Order on or before February 28, 2025

Overarching EEAC and Mass Save 2025-2027 Priorities

- **Decarbonization**
- **Distributive Justice**
- **Simplify Customer Journey**
- **Energize and support communities**
- **Improved data access and sharing**

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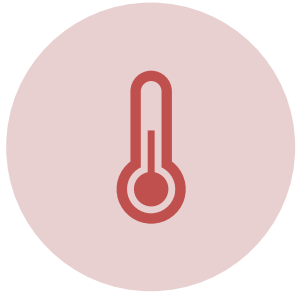
EEAC Key Commercial & Industrial Sector Recommendations

- Provide support for existing building commissioning to further near- term efficiency, stimulate market, and support customer planning
- Redesign energy assessments to engage, inform and drive customer action
- Support decarbonization planning
- Expand and enhance account management models to improve customer journey
- Increase incentives for weatherization and electrification

EEAC Key Residential Sector Recommendations

Launch revised New Homes and Renovations Program to promote electrification and above code performance



Increase paired adoption of weatherization and heat pumps

Redesign Home Energy Assessments to identify decarbonization opportunities

Simplify the customer journey with a single point of contact, bundling services (HVAC and weatherization), easier to understand collateral material, reducing requirements for service access, rebates and loans.

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EEAC Key Income Eligible Sector Recommendations

01

Expand efforts to reach all income eligible customers beyond those identified through utility discount rate enrollment or participation in other income eligible programs

02

Base income eligibility using either AMI or SMI, whichever is higher, to allow for more participation

- Test simplified verification

03

Simplify customer journey to reduce the number of visits to a customer's home and provide one point of contact

04

Expand electrification offers to include additional appliances (e.g., induction cooktops) and technologies (e.g., air to water heat pumps)

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EEAC Key Equity Recommendations

- Automatically qualify and increase incentives for rental properties in select geographic areas
- Simplify qualification and increase incentives for homeowners and renters outside select geographic areas
- Simplify the customer journey (one stop service, simplified income verification, simplified multi-step action plan, instant rebates and facilitated support)
- Identify and implement approaches to address the potential increase in utility costs that may occur with heat pump adoption
- Develop cost management strategies, e.g., fixed pricing model for heat pumps as used in weatherization
- Provide additional funding to support CFPs (heat pump coach, facilitators, small business liaison, language services)
- Provide end-to-end language services in 7 identified languages

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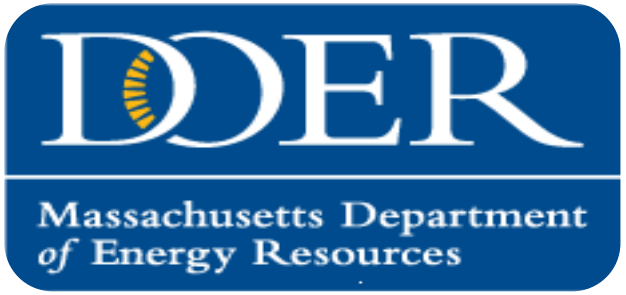
THANK YOU!

Creating A Clean, Affordable, Equitable and Resilient Energy Future For the Commonwealth



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Grid Modernization Advisory Council & Electric-Sector Modernization Plans

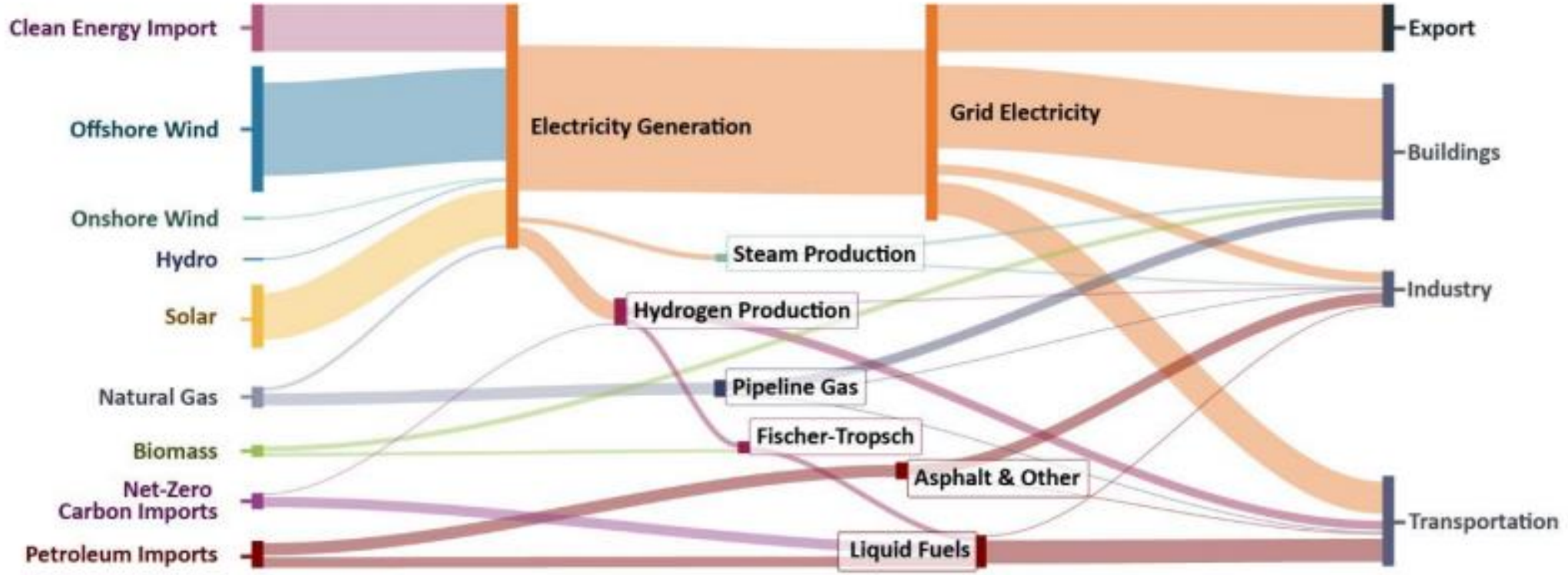
Leading By Example Council Meeting
January 16, 2024

Importance of the Electric Grid

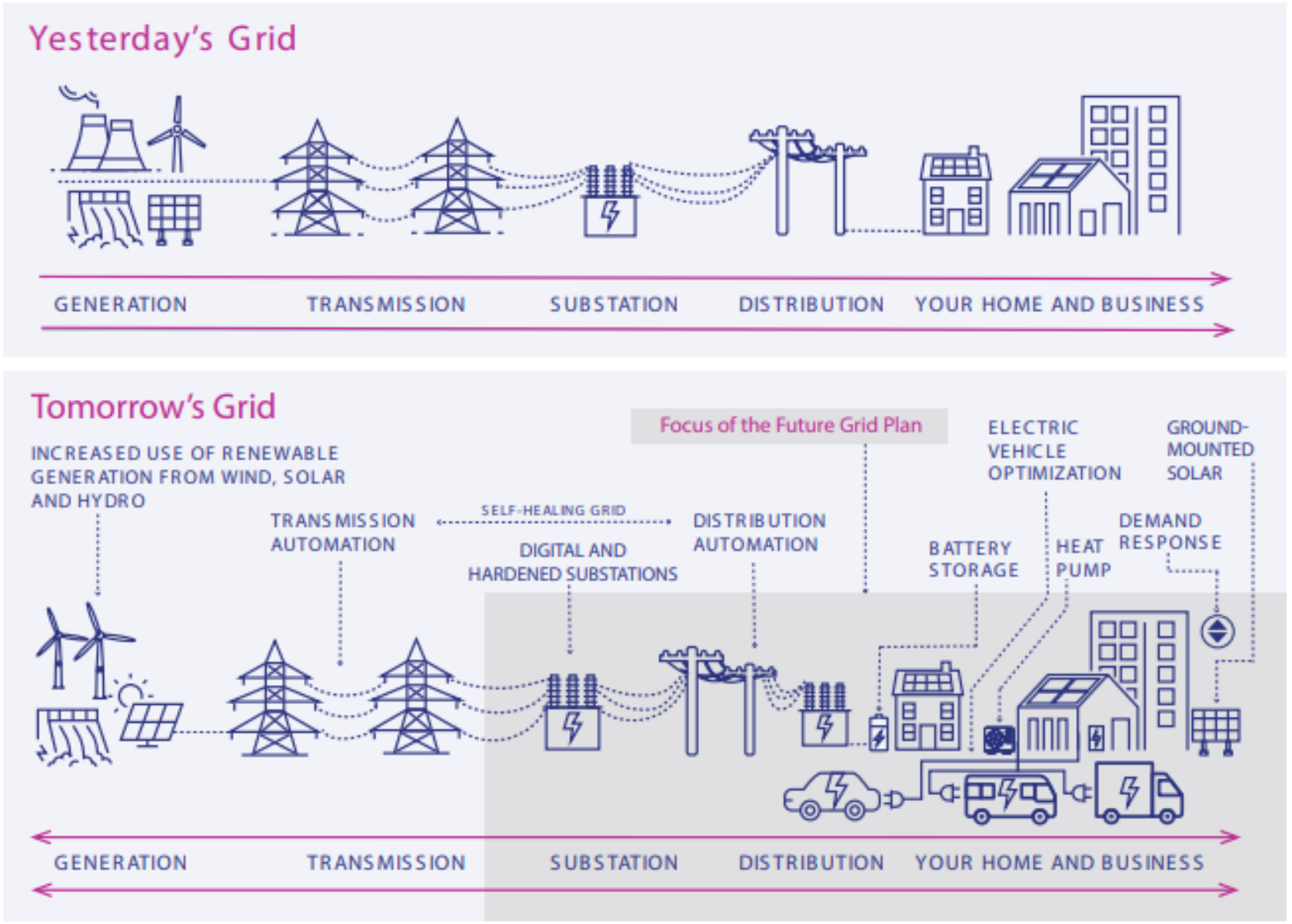
- The Global Warming Solutions Act requires Massachusetts to achieve net zero emissions in 2050.
- The Clean Energy and Climate Plan for 2050 states that Massachusetts' path to economy-wide decarbonization relies on an expanded role for the power system. Thus, **power sector "distribution system planning" is essential**.

2050 Commonwealth Energy Use

Source: Clean Energy and Climate Plan for 2050



Refresher: The Electric Grid



Source: National Grid, ESMP, page 9.

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What is the Grid Modernization Advisory Council?

The Grid Modernization Advisory Council (GMAC) and Electric Sector Modernization Plan (ESMP) system was set in place by "An Act Driving Clean Energy and Offshore Wind" (the Climate Law) in 2022.

- The law states that the GMAC shall encourage:
  - least-cost investments in the electric distribution system,
  - alternatives to investments or financing investments that will help achieve greenhouse gas emissions limits,
  - transparency and stakeholder engagement in the grid planning process.

- GMAC to review and provide recommendations on electric distribution company ***electric-sector modernization plans*** to:
  - **maximize customer benefits** and demonstrate **cost-effective investments** in the electric distribution grid,
  - support investments to **enable interconnection** of, and communication with, distributed energy resources and transmission-scale renewable energy resources,
  - facilitate **electrification** of buildings, transportation and other sectors,
  - improve grid **reliability** and **resiliency**, and
  - minimize or mitigate **impacts on ratepayers**.

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GMAC & ESMP Process (Through 5-years)

GMAC activity
Statutory requirements
Reporting requirements

2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028

2022 Climate Law
Grid Modernization Advisory Council (GMAC) established

Regular GMAC meetings

GMAC meeting cadence to be determined

GMAC meetings on a monthly basis

9/01/2023:
EDCs submit ESMPs to GMAC

11/20/2023:
GMAC provides feedback on ESMPs to EDCs (80 days to review)

1/29/2024
- EDCs finalize ESMPs and file with the Department of Public Utilities (DPU)
- EDCs respond to GMAC comments

8/29/2024:
Within 7 months of filing, DPU issues an Order approving, modifying, or rejecting ESMPs

ESMP Phase I

Reporting: EDCs submit 2 reports per year to DPU and Massachusetts Joint Committee on Telecommunications, Utilities and Energy on deployment of approved investments in accordance with any performance metrics

X: 1st report	X: 1st report	X: 1st report
X: 2nd report	X: 2nd report	X: 2nd report

Every 5 years
EDCs consult w/GMAC and file an updated ESMP with DPU.

Late 2028:
EDCs submit second ESMP to GMAC for review

See past GMAC meeting minutes, materials, and more on the GMAC website:
https://www.mass.gov/info-details/grid-modernization-advisory-council-gmac

What are the Electric-Sector Modernization Plans (ESMPs)?

- The state's investor-owned electric distribution companies (EDCs), Eversource, National Grid, and Unitil, are required by the 2022 Climate Law to submit ESMPs.
- The ESMPs describe the current state of the distribution grid, the utilities' current and proposed investments in our electric grid, the future of reliability, a forecast of our future power needs, strategies to support renewable energy resources, electric vehicles, and electrified buildings, and more.

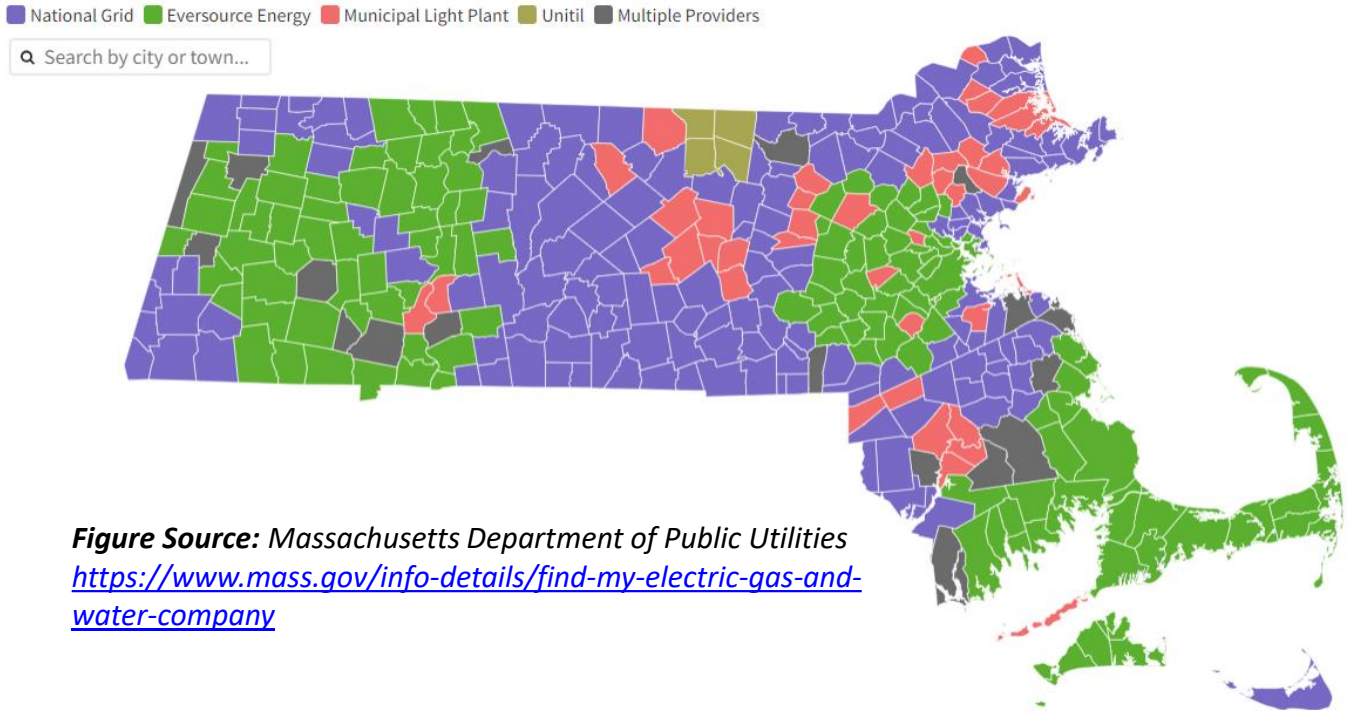


Figure Source: *Massachusetts Department of Public Utilities* *https://www.mass.gov/info-details/find-my-electric-gas-and-water-company*

The ESMPs use the same outline, shown below:

ESMP Contents

1.0	Executive Summary
2.0	Compliance with the EDC requirements outlined in the 2022 Climate Act
3.0	Stakeholder Engagement
4.0	Current State of the Distribution System
5.0	5- and 10-Year Electric Demand Forecast
6.0	5- and 10-Year Planning Solutions: Building for the Future
7.0	5-year Electric Sector Modernization Plan
8.0	2035 - 2050 Policy Drivers: Electric Demand Assessment
9.0	2035 - 2050 solution set – Building a Decarbonization Future
10.0	Reliable and Resilient Distribution System
11.0	Integrated Gas-Electric Planning
12.0	Workforce, Economic, and Health Benefits
13.0	Conclusion
14.0	Appendix

Summary of 5-Year Investments: Eversource

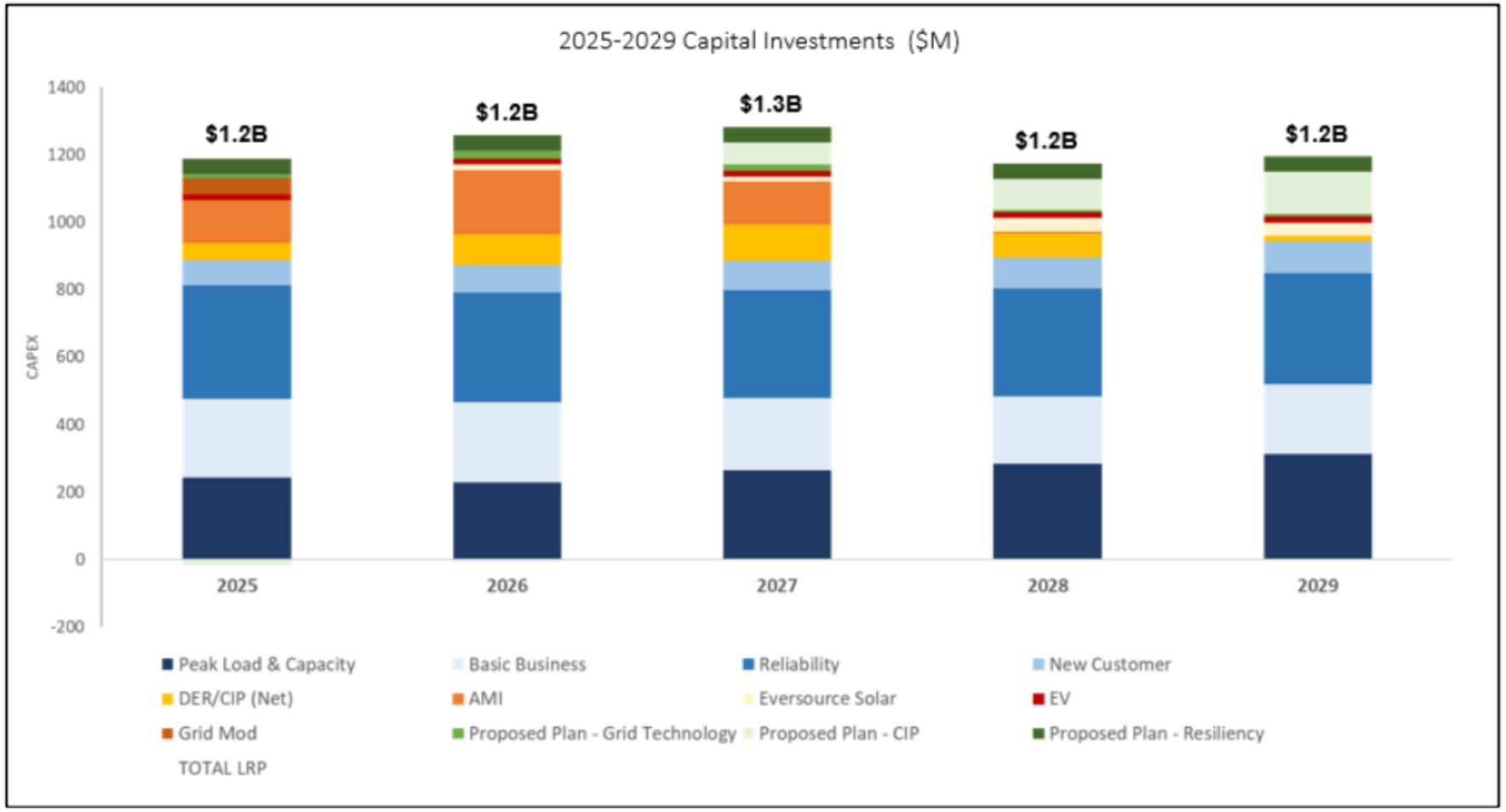


Figure 182: 2025-2029 Capital Investments ($M)
Source: Eversource ESMP Chapter 7, pg. 378

For the 5-year period from 2025-2029:

New proposed capital investment for the ESMP include:

- **Green** = **~$0.6 billion** for grid modernization, CIPs*, and resiliency.

Other approved, pending, and proposed investments** include:

- **Blue** = **~$4.5 billion** in capacity and reliability investments paid for by base distribution rates
- **Yellow**, **orange**, **red**, **brown** = **~$1 billion** clean energy enablement investments (AMI, EVs, CIPs, grid modernization*) paid for by dedicated mechanisms

**AMI = Advanced Metering Infrastructure, EVs = Electric vehicles; CIPs = Capital investment projects from the Provisional System Program*

***Investments provided in the ESMPs use the best available information as of 9/1/23 and incorporate investments currently pending DPU approval such as the "Eversource Solar" item and 5 of the 6 CIP areas that are included in the "DER/CIP (Net)" item.*

Summary of 10-year Projects: Eversource

Over the next **10 years**, Eversource proposes to build **17** new substations, and upgrade **26** existing substations

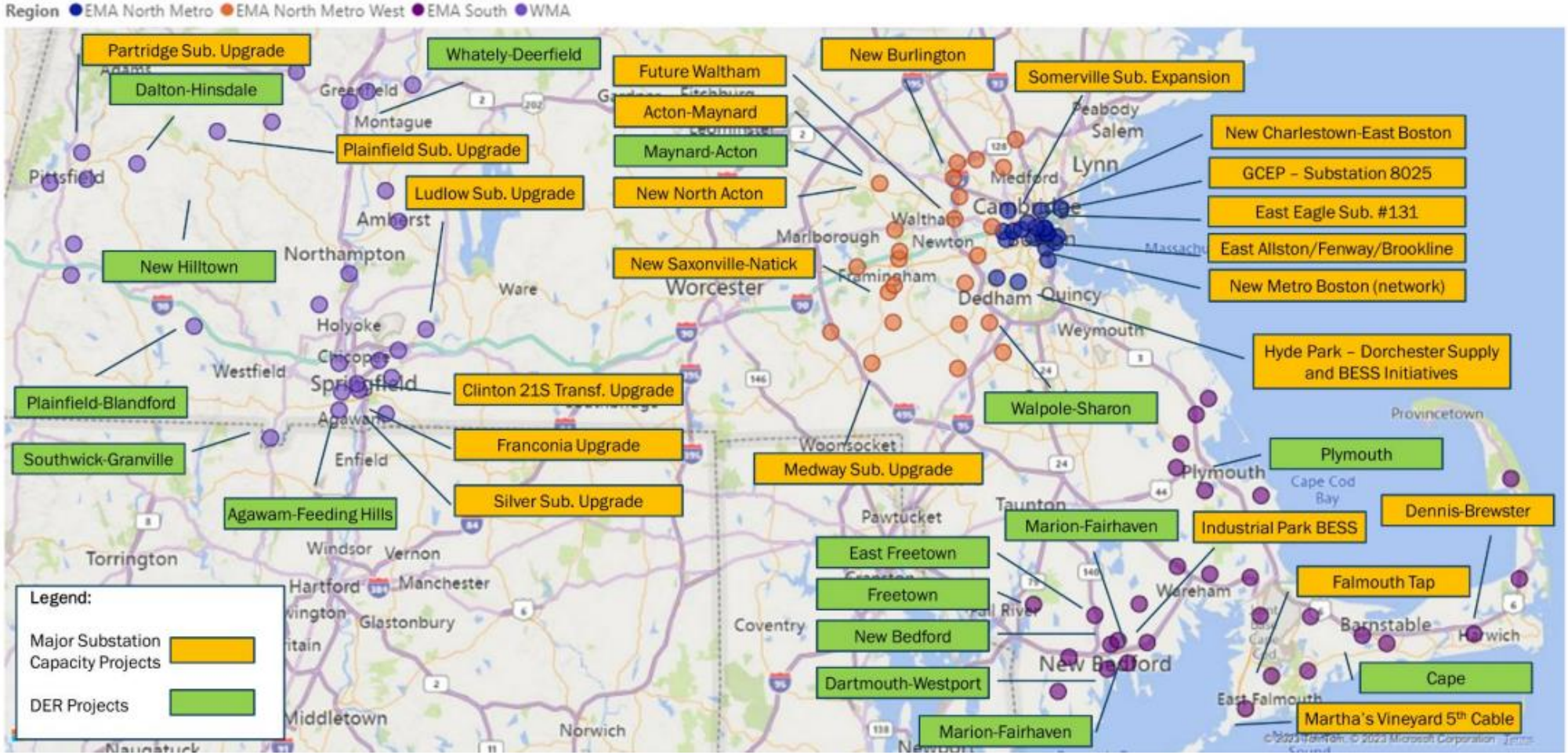


Figure 145: Location of Proposed and Approved Substation Upgrade Projects and CIPs in the Ten-Year Solution Plan

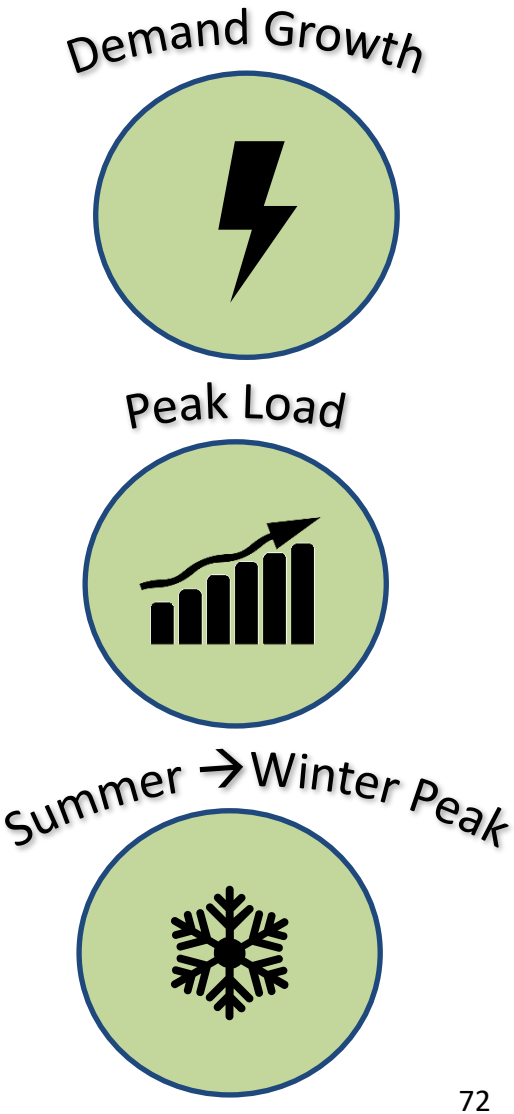
**Regional maps in greater detail are available in Chapter 6 of Eversource's ESMP*

Source: Eversource ESMP Chapter 6, pg. 262

Electric Demand Forecasts

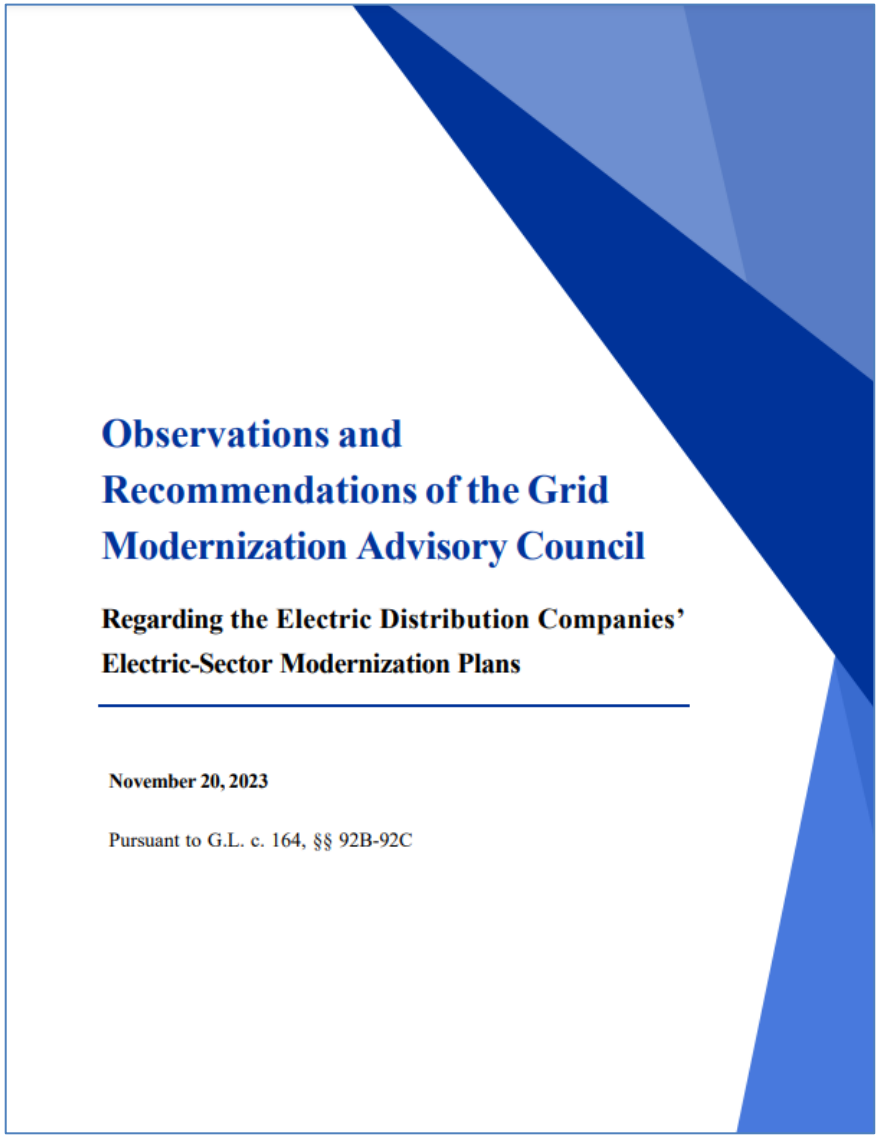
- Each ESMP includes a 5-year and 10-year forecasts for the EDC's territory, as well as a demand assessment through 2050.
- Some take-aways from the forecasts include:

EDC	Eversource	National Grid	Unitil
Estimated electric demand growth from 2025-2034	16%	21%	13%
Drivers of peak load growth	Economic development (new buildings or existing site re-development)	Beneficial electrification from electric vehicles	Both building electrification and baseload growth
Shift from summer to winter peaking electric system	2035	2036	2034
Sources	Eversource ESMP pages 187-188	National Grid ESMP pages 196, 200, 325	Unitil ESMP pages 62, 134



Final GMAC Report

- The Final GMAC Report includes:
  - **37** observations categorized by general topic area (overarching observations, missing information, requirements of the Climate Act, stakeholder engagement, load forecasting, solution sets, and infrastructure/investment proposals)
  - **88** recommendations categorized by overarching recommendations and chapter-specific recommendations
- The GMAC Equity Working Group also developed a Memorandum with **12** equity-specific recommendations and various metrics that were adopted by the GMAC



GMAC Overarching Recommendations

1. The EDCs should include in their ESMPs more detail on **strategic planning.**

2. The ESMPs should be clear in identifying and describing which investments have been **approved by the DPU, are pending before the DPU, or are newly proposed.**

3. The ESMPs should propose a **long-term proactive distribution system planning process** and **long-term cost allocation methodology.**

4. The EDCs should be more transparent about the **load forecasts.**

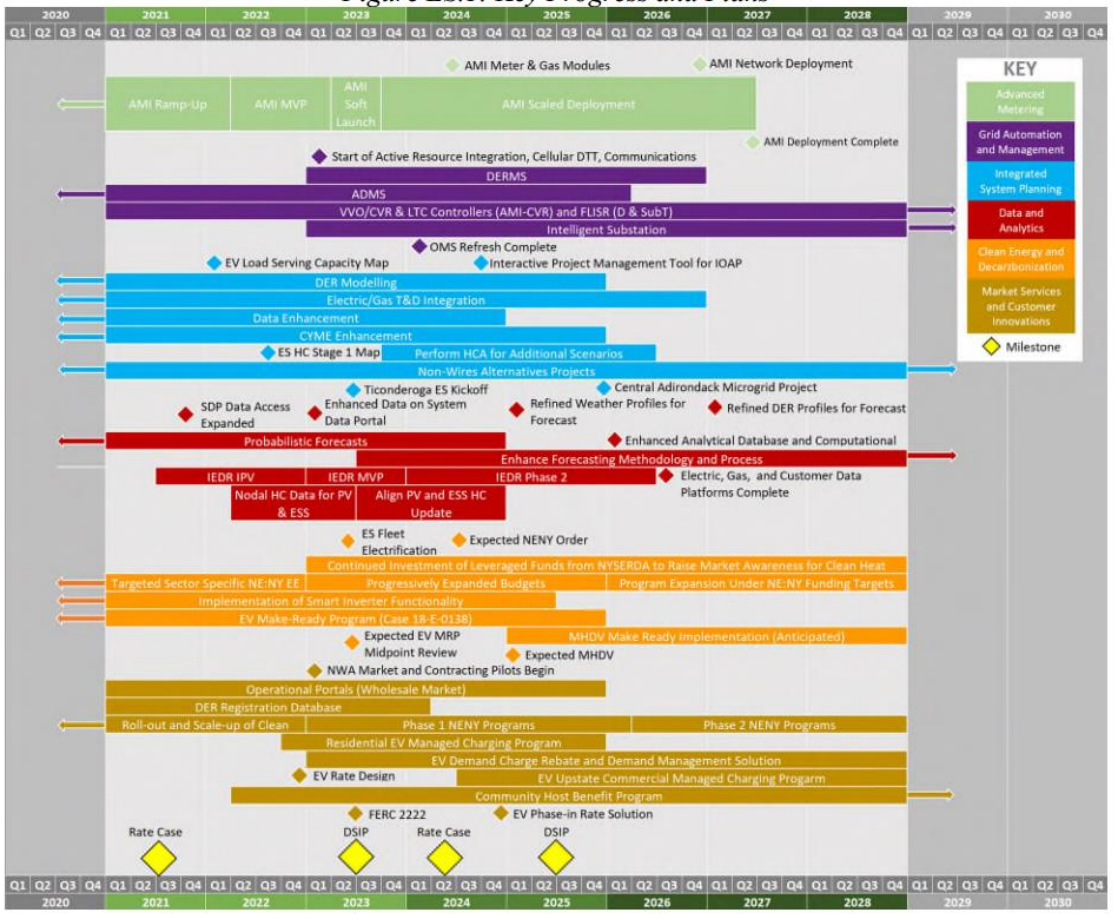
5. The EDCs should include more discussion of **investment alternatives** and alternative approaches to financing investments.

6. The EDCs should respond to the recommendations included in the **Memorandum of the GMAC Equity Working Group.**

7. The ESMPs should include a list of areas for **effective policy** to further clean energy objectives.

8. The ESMPs should describe how **alternative rate designs** can be utilized.

Figure ES.1: Key Progress and Plans



National Grid, Distributed System Implementation Plan Update of Niagara Mohawk Power Corporation d/b/a National Grid at 3, Figure ES-1, available at https://jointutilitiesofny.org/sites/juny/files/National%20Grid%20DSIP.pdf.

Next Steps

- The EDCs will file final ESMPs to the DPU on **January 29, 2024.** They are required to respond to the GMAC recommendations in their filing.
- Within **seven months** after filing, the Department must approve, approve with modification, or reject the ESMP filings.
- The GMAC, Executive Committee, and Equity Working Group will continue to meet on a ~quarterly basis throughout the docket process and will provide public-facing informational sessions on the ESMP dockets.
- The next GMAC meeting is on February 28, 2024.

Procedural Schedule for D.P.U. 24-10, 24-11, and 24-12	
Date	**Action**
January 29, 2024	ESMP filings submitted to DPU
January 30, 2024	Discovery (General Track) begins
March 5, 2024	Intervenor testimony due
March 25, 2024	Deadline to issue discovery
April 8 – April 26, 2024	Evidentiary hearings
TBD	Briefing
August 29, 2024	DPU Order deadline

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Thank you!

GMAC resources available at: https://bit.ly/MA-GMAC

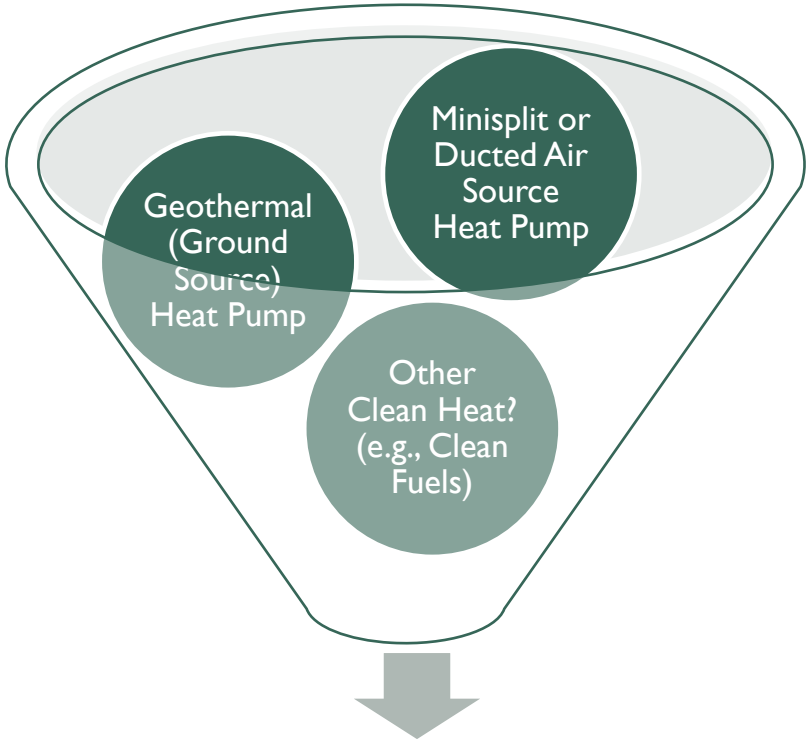
Read the Final GMAC Report

MassDEP is tasked with developing a Clean Heat Standard: "a **practical and cost-effective policy tool** to meet emissions reduction goals for the thermal sector, and it could be **implemented in a progressive, equitable manner**."[1]

1. 2025/2030 Clean Energy and Climate Plan Appendices pp 41

WHAT IS A CLEAN HEAT STANDARD?

- A Clean Heat Standard is a regulatory program that requires heating energy suppliers to reduce their GHG emissions over time by acquiring clean heat credits
- Regulated companies (suppliers) would include suppliers of heating oil, propane, natural gas, and electricity
- Suppliers would demonstrate emissions reductions through clean heat credits
- Suppliers could implement clean heat themselves or purchase credits from third parties, such as heat pump installers
- Clean heat credits would be generated by implementing clean heat, such as electric heat pumps



MassDEP is seeking stakeholder input on the draft program framework by December 21, 2023

DRAFT FRAMEWORK OVERVIEW

Setting the Standards | Regulated Heating Energy Suppliers | Credit Generation | Compliance Flexibility and Revenue

- The CHS would require **annual emission reductions** from the thermal sector while ensuring ongoing progress toward **full electrification of buildings**

Clean Heat Standard

Emission Reduction Standard

The emission reduction standard would require an increasing amount of GHG emission reductions each year from 2026 through 2050

Full Electrification Standard

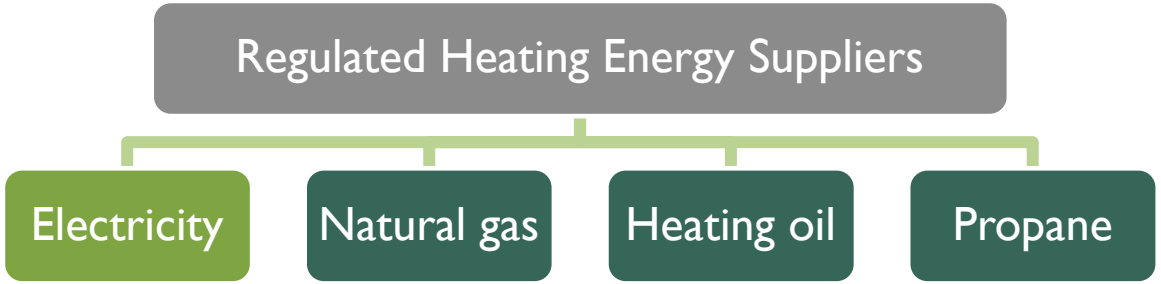
The full electrification standard would require the electrification of a set number of residences each year, and **25% of full electrifications must serve low-income customers**

DRAFT FRAMEWORK OVERVIEW

Setting the Standards | **Regulated Heating Energy Suppliers** | Credit Generation | Compliance Flexibility and Revenue

Heating Energy Suppliers

- Regulated entities would include retail sellers of **electricity**, **natural gas**, **heating oil**, and **propane**
- Each regulated entity would have both an emission reduction and full electrification obligation each year



Full Electrification Compliance Obligation for All Heating Energy Suppliers in 2030

- Full electrification - fuel suppliers
- Equity carve out - fuel suppliers
- Full electrification - electricity suppliers
- Equity carve out - electricity suppliers

DRAFT FRAMEWORK OVERVIEW

Setting the Standards | Regulated Heating Energy Suppliers | **Credit Generation** | Compliance Flexibility and Revenue

Clean Heat Credits (CHCs)

Emission Reduction CHCs

Generated each year from using clean heat from an eligible technology or fuel:

- **Full electrification projects**
- **Hybrid systems** retaining fossil backup systems
- **Documented delivery of eligible liquid biofuels** by heating oil suppliers

Full Electrification CHCs

Generated one time upon installation of residential full electrification projects that:

- Install **electric heat pumps** capable of meeting **100% of space heating needs**; and
- **Remove all combustion space heating equipment** or commit to limiting use of fossil equipment to backup or emergency use

Regulated energy suppliers would obtain CHCs by

1. Implementing clean heat themselves
2. Purchasing credits from third parties, such as heat pump installers

DRAFT FRAMEWORK OVERVIEW

Setting the Standards | Regulated Heating Energy Suppliers | **Credit Generation** | Compliance Flexibility and Revenue

Voluntary Early Action Registration Program

- Would encourage early action by registering **residential full electrification projects** that are completed before the final CHS regulations are in place
- Administrative support would offer resources targeted toward registering equity carve out projects

Evaluating Other Actions for Crediting

- MassDEP must consider crediting other fuels in the **2028 program review** and **future program reviews every 5 years** thereafter
- Fuels would be evaluated based on the following considerations:

Lifecycle analysis of GHG emissions

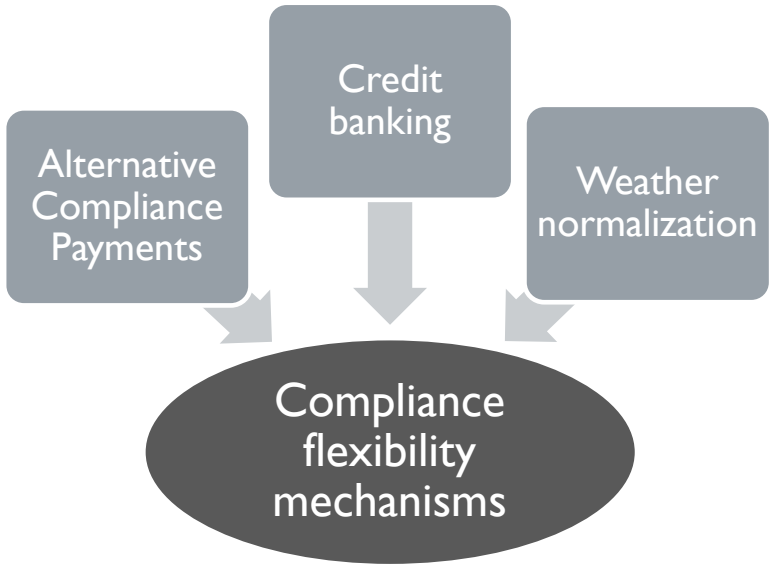
Detailed analysis of fuel availability

Any local air pollution impacts

DRAFT FRAMEWORK OVERVIEW

Setting the Standards | Regulated Heating Energy Suppliers | Credit Generation | Compliance Flexibility and Revenue

The CHS would include several **compliance flexibility mechanisms**



Several CHS provisions could result in **revenue**, creating an opportunity to **promote equitable outcomes**

Alternative Compliance Payments

ACP revenue would primarily support future clean heat and credits

All ACP funds from the equity carve out would support future low-income full electrifications

Just transition fee

Full electrifications not eligible for the equity carve out would pay a fee on the first transfer of each credit

Funds would assist low-income consumers during the clean heat transition

Other support

MassDEP may offer additional support to low-income households

This support could be funded by ACP or just transition fee revenue, other MassDEP revenue, or other state programs

DOER
Massachusetts Department of Energy Resources

National and World Environmental Days: Spring 2024

- March 18: Global Recycling Day
- March 22: World Water Day
- April 22: Earth Day
- May: No Mow May
- May 17: Bike to Work Day
- May 20: World Bee Day

Next LBE Council Meeting

Save the Date!

March 12th

10am-12pm

Upcoming Tentative Meeting Dates:
May 14th
July 9th