Advancing the Clean Energy Future

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November 30, 2017

Commissioner Martin Suuberg
Massachusetts Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Dear Commissioner Suuberg:

The undersigned eleven organizations are writing in response to the request for comments on the Review of Options for Expanding the Clean Energy Standard. We appreciate the numerous efforts of the Massachusetts Department of Environmental Protection (MassDEP) to improve public health and lower carbon pollution. However, we do not believe that MassDEP should adopt the proposed CES-E for existing clean generators, as laid out in the Stakeholder Discussion Document.

The better approach to valuing and leveling the playing field for all forms of non-emitting electricity generation, while also insulating ratepayers from market risk, is to use market-based carbon emissions programs, such as the existing Regional Greenhouse Gas Initiative (RGGI), to support our climate commitments. As MassDEP knows, RGGI is a cooperative, successful, and nationally significant program that reduces GHG emissions in nine states by charging power plants for each ton of carbon dioxide released into the atmosphere. The RGGI states have recently completed a program review to set carbon pollution reduction targets through 2030, which will impact how much fossil-fueled power plants pay for pollution permits. Higher prices for pollution permits will increase the economic competitiveness of all forms of non-emitting electricity generation without favoring any one specific technology. If the recently agreed upon changes prove to be insufficient to send an appropriate market signal, Massachusetts should work with regional partners through the next program review to better align RGGI with clean energy goals.

There are also significant unknowns in the design of the CES-E and the purpose of additional compensation for these projects. The stakeholder discussion document does not lay out whether the potential cutoff date for eligibility would be January 1, 1990 or December 31, 1990, a significant decision given that Seabrook Nuclear Station began operation in the middle of 1990.[1] In general, existing generation facilities were designed to recoup their investments based on expectations at the time the facility was built, and do not necessarily require additional financial support. Retirements of older generation facilities are also part of the natural course of events and do not automatically deserve a dedicated policy response. Similarly, it is not necessarily worth significant expenditures to satisfy current GHG inventory accounting practices. Lastly, the Trump Administration and the Federal Energy Regulatory Commission are currently considering significant policy changes that could impact ISO-NE and compensation for certain types of generation projects, particularly nuclear generation in ISO-NE.

In summary, we appreciate the continued efforts of MassDEP but urge that the CES-E should not be adopted.

[1] https://www.nexteraenergyresources.com/what/nuclear_seabrook.shtml

Sincerely,

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November 30, 2017

Mr. William Space
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

RE: Request for Stakeholder Comments - Expanding Clean Energy Standard Eligibility to Include Existing Clean Energy Generation

Dear Mr. Space:

Associated Industries of Massachusetts ("AIM") is pleased to provide the following comments to the above-mentioned request for stakeholder comments.

AIM is the largest general trade association in Massachusetts. AIM's mission is to promote the prosperity of the Commonwealth of Massachusetts by improving the economic climate, proactively advocating fair and equitable public policy, and providing relevant, reliable information and excellent services.

Our members are impacted by the implementation of the Clean Energy Standard ("CES") and some are harmed directly by its existing vintage requirements as it unnecessarily impedes their ability to remain viable. Additionally, the larger ratepayer community is also harmed because the vintage requirement arbitrarily limits the ability of some sources to compete for CES compliant generation, and this unnecessarily limits the availability of clean energy and raises the cost of compliance and ultimately the cost of electricity.

AIM has followed the development of the CES from its initial proposal and submitted several sets of comments throughout the regulatory process. We were also part of the stakeholder group active during development of the Energy Diversity Act (Chapter 188 of the Acts of 2016). We want to thank the Department for continuing this process in an open manner.

The request for stakeholder comments specifically asks two questions: first, whether DEP should consider a new category of existing clean energy sources ("CES-E') to include 1990-2010 vintage clean energy sources otherwise eligible for CES compliance (with their own minimum purchase requirements and Alternative Compliance Payments ("ACP")) and second, whether there should be eligibility requirements (size, location etc.) to limit sources eligible for the CES-E. As we understand it, sources most likely to be included in the 1990-2010 vintage are large-scale hydropower and the Seabrook nuclear power station. Although it is not clear how the mechanics of the CES-E would ultimately work since there are no concrete regulatory proposals, based on DEP's GHG inventory approximately 9 million MWh of output – 6.2 million MWh

from hydropower and 2.8 million MWh from nuclear generation would potentially meet the proposed vintage and source requirements.

DEP has also indicated that comments do not need to be limited to the specific questions presented in the stakeholder documents.

Since the goal of this process is to preserve existing clean energy generators, AIM supports including all 1990-2010 vintage sources in the CES and would also suggest that DEP consider some limited pre-1990 sources for inclusion. While establishing a separate CES-E is certainly one way to preserve existing sources, for simplicity and cost containment DEP should bring existing sources into the current CES as a first step. This may in fact result in a more cost-effective outcome as some CES-E sources will eventually outlive their useful life and a shortage will then develop in the CES-E, leading to payment of an ACP. Even if the CES-E had a lower ACP than the CES, it is unknown whether that would make a difference in overall compliance costs.

KEEPING ALL EXISTING CLEAN ENERGY SOURCES VIABLE IS VITAL TO MEETING CARBON REDUCTION GOALS AT THE LOWEST POSSIBLE PRICE

As you know Massachusetts has some of the highest electric rates in the country and much of the reason is due to mandates and limits on electricity supply other states do not have. In fact, recent DEP regulations curtailing in-state fossil fuel generation output (310 CMR 7.74) is already attracting the concern of ISO-New England. On November 16, the Internal Market Monitor of ISO-New England sent a memo to the NEPOOL Markets Committee addressing possible reduced profits to generation units because of these declining emission limits. To address this issue, the Internal Market Monitor developed a lost opportunity cost ("LOC") adder which is likely to add costs to ratepayer's bill. This development runs counter to the initial statements of DEP that the new standards would have virtually no impact on electricity rates.

While 310 CMR 7.74 is not the topic here, we believe this recent development indicates why it is incumbent upon DEP to strive to allow compliance with the CES regulation in a way that does not impact electricity prices negatively.

In this case that would mean keeping already functioning clean energy resources viable. These resources are already contributing to our GWSA goals and are likely significantly cheaper than new resources. In fact, DEP has made it clear the state will not meet its GWSA goals without existing clean energy generation and that makes it essential to keep them operating. Massachusetts has a CES requirement of 80% by 2050. Why this must be met with new sources is simply puzzling.

ADDING A CES-E WILL FURTHER COMPLICATE CLEAN ENERGY PROGRAMS, MAKING IT IMPOSSIBLE FOR BUSINESSES TO KNOW EXACTLY WHAT TYPE OF POWER THEY ARE USING

The renewable or clean portion of power used by companies should be a relatively easy amount to ascertain, particularly when such a number is often asked during business as a measure of a company's sustainability commitment.

The CES-E will add another definition (and requirement) to an already complicated list of state-only definitions surrounding renewable and clean power.

Currently there are at least 6 classifications that an energy supplier (and customer) must comply with to be compliant with Massachusetts electricity supply laws and regulations, each with its own minimum purchase requirements and ACPs. The CES-E (which would be similar to the RPS Class II) would add a seventh.

They are as follows:

- RPS Class I – primarily post-1997 wind, solar, small hydropower (30 MW and below) and biomass
- Solar Carve Out – part of RPS Class I but a separate compliance scheme
- RPS Class II Renewables – like RPS Class I but with a commercial operation date prior to January 1, 1998 and with size requirements on hydropower (under 7.5MW)
- RPS Class II Waste-to-Energy – units that burn solid waste to generate steam or electricity
- AEPS (Alternative Energy Portfolio Standard) – primarily Combined Heat and Power (CHP), flywheel storage, and efficient steam technologies
- CES – includes the RPS Class I as above – but non-RPS Class I clean generation units (primarily large-scale hydropower) have a post-2010 vintage requirement (and with proposed amendments under a separate DEP rulemaking include non-vintage units that responded to Section 83D bidding if they are chosen as winners)
- CES-E - (proposed - the subject of these comments). Non-RPS clean generation units with a vintage 1990-2010 (primarily large-scale hydropower and some nuclear units)

In addition, there are pre-1990 non-nuclear clean energy generation units that serve Massachusetts and contribute to lowering greenhouse gases in Massachusetts (primarily hydropower that doesn't meet the other RPS categories). Other clean energy (primarily nuclear) do not currently serve Massachusetts.

Each one of these categories is treated differently (with costs varying significantly across categories), yet in the end virtually all contribute carbon free and efficient power to Massachusetts ratepayers. And all are extremely important.

We urge DEP not to complicate this any further. The 1990-2010 vintage sources that would otherwise meet the CES eligibility should be granted full eligibility for compliance with the existing CES.

DEP'S STATED REASONS FOR EXCLUDING EXISTING SOURCES FROM THE CES IN THE FIRST PLACE WAS NOT CREDIBLE

In the background document DEP states their reasons for not allowing CES eligibility for 1990-2010 sources is that DEP did not want to encourage significant resource shuffling and windfall profits, and also that existing low and zero-emissions generators already benefit from the incentives created by the RGGI since they do not need to purchase allowances. *(310 CMR 7.75:*

Clean Energy Standard Review of Options for Expanding the CES Stakeholder Discussion Document, page 2-3).

Neither argument is persuasive.

First, these sources are already reducing carbon emissions in the region. While it is possible there could be some attempts to shuffle resources that should not be DEP's concern. DEP's role is to develop options that allow sources to meet *our* regulations – and to the extent that resources find doing business with Massachusetts suppliers more attractive, so be it. Additionally, based on current extensive inventories, this should not even be a significant problem, particularly for sources after 1990. DEP already knows who the applicable 1990-2010 sources are that would be added to the CES and approximately how much output the sources already deliver to Massachusetts. Therefore, limiting CES eligibility to those sources and quantities should not be a large regulatory burden for DEP or anyone else.

Second, the notion that adding 1990-2010 vintage sources might unjustly enrich them because they already have a competitive advantage due to not needing to comply with RGGI is likewise not a valid argument.

By enacting the CES in the first place, DEP already indicated that double dipping is ok – if they had not there would have not been a CES at all.

The *Energy Diversity Act of 2016* required the solicitation of offshore wind and clean energy sources (Section 83C and 83D). Other than those sources that are RPS Class I eligible, there were no incentives available under any regulatory program for non-RPS clean energy sources (like large hydropower), except, like existing clean energy sources, they did not have to pay carbon fees under RGGI. Without any incentives at all, 49 sources bid in the clean energy RFP under Section 83D, the majority of which were non-RPS eligible clean energy sources (primarily large hydropower) – a true market mechanism at work.

If was only *after* the conclusion of the bidding process that DEP promulgated the CES, which retroactively required that electricity suppliers purchase a certain amount of "clean energy" over the next decades, even though there was no opposition to the Section 83C and 83D process and in fact there was every indication they would move forward. Therefore, as AIM argued in our initial comments opposing the CES, the regulation was completely unnecessary to secure clean energy.

By enacting a CES, DEP gave a non-RPS clean energy sources a thumb on the scale in the review process by retroactively making them eligible for a compliance standard they didn't ask for. Like existing clean energy generators, they also don't have to pay RGGI fees – only now if the CES is not met a penalty must be paid – by the ratepayer – a bit of circular regulatory justification.

This is identical to the issue presented here. *Existing* sources only need incentives beyond RGGI to stay viable because DEP determined that *new* sources need additional incentives beyond RGGI to start operation.

It is not even clear if a CES credit will have a monetary value – therefore any notion of enrichment could be premature. If further long-term contracts are required to meet CES goals, it is likely that the CES requirements will easily be met without additional compensation. In fact, having a CES-E with a discreet requirement will make existing sources more valuable and it is possible a CES-E credit may be worth more than a CES credit, since the available units to fulfill the CES-E mandate are finite and output may decline over time creating shortfalls. This would not be a desirable outcome.

ADDING EXISTING SOURCES TO THE CURRENT CES WILL LOWER PRICES

It is clear from projections that the 80% CES standard cannot be met with the current Section 83C and 83D long term contracts, even at full build. While merchant generators could enter the market to supply the remaining supply beyond the Section 83C and 83D solicitations, it is possible that that won't happen and additional legislation requiring further long-term contracts will be required.

DEP should maximize the use of existing clean energy resources and deal with shortfalls or over subscriptions to the CES later when the dust clears. If additional long-term contracts or other changes are necessary in legislation or regulation are later required, support will be broader as it will be evident DEP took advantage of the cheapest options first.

In the end, Massachusetts can only get to 100%. At that time the job is done. There are perfectly good clean energy sources available, the Commonwealth needs to recognize them for the cost-effective benefits they provide.

IF THE CES IS EXPANDED TO INCLUDE EXISTING SOURCES, THE VINTAGE REQUIREMENTS SHOULD BE REVISITED

If the CES is expanded to include existing sources, AIM suggests that vintage requirements be eliminated, except for nuclear units which could remain at a 1990 level. The reason to include earlier vintages is to once and for all eliminate further discussions about clean energy sources and to essentially "lock them up" for our use. There is not likely to be many pre-1990 non-nuclear clean energy sources available and leaving this last amount of clean energy orphaned is simply not in the best interests of ratepayers.

Similarly, for the same reason there should be no limitations on sizes, again to allow DEP to get a firm handle on the types of sources contribution to our greenhouse gas reduction efforts.

ADDING A SEPARATE CES-E WILL STRAIN OTHER RESOURCES

As proposed, the CES-E would be in addition to the CES, like an RPS Class II. Therefore, in 2050 the CES requirement will be near 100%, depending on the capacity of the CES-E. Adding the CES-E is essentially raising the CES. While this may be a noble accomplishment, under current technologies this may be dangerous to our reliable electric grid. Requiring 100% clean energy so fast will essentially drive out backup fossil generation, leaving Massachusetts vulnerable if some clean energy does not perform as expected or goes offline earlier. This could lead to higher prices as backup fossil generation will have to be compensated.

AIM is not suggesting that our clean energy goals stop at 80%. If, after adding existing resources and Section 83C and Section 83D projects are operational CES goals are met early, DEP could consider strategic increases in the CES to maintain balance and forward momentum. We just urge the DEP not to do it now, when things are just beginning to materialize with no guarantee how it will all shake out.

CONCLUSION

The current CES is an arbitrary and artificial accounting of clean energy projects that were already going to happen. Many of the current proposals for clean energy were developed long before the CES standard was even suggested and there was no indication at all that any type of additional incentives were needed.

It is time to simplify the renewable and clean energy sectors in Massachusetts. Bringing all the existing clean energy sources under one umbrella will allow Massachusetts to meet our clean energy goals efficiently and in a cost-effective way. This will "true up" all our clean energy sources. And it will be easily explainable to outsiders looking to locate here because of our sustainability efforts. Should the DEP not want to allow pre-1990 nuclear power, there is no reason that DEP could not establish vintages for nuclear power alone, with no vintage for other sources.

AIM urges the DEP to thread thoughtfully as to whether adding another clean energy standard category is the best option for preserving existing resources. However, should the DEP decide that adding a CES-E is the path they chose to take, our comments above are still applicable to the CES-E. The goal should be simplicity to reduce the costs of compliance. To that extent that any of our comments further that goal we urge DEP to consider them, particularly an all-in approach regarding vintages (except limiting nuclear to post-1990 vintage). Additional flexibility will also be needed in the event a CES-E unit goes offline permanently. What should not happen is a shortage in the CES-E (with ACPs) when the CES itself is fully subscribed. These and other issues need to be fully vetted should the DEP decide to add a CES-E.

Thank you for allowing us to make these comments and we look forward to working with your office in any way possible to help transition Massachusetts to a clean energy economy.

Should you have any questions please do not hesitate to contact me.

Sincerely yours,

Robert A. Rio, Esq.
Senior Vice President and Counsel
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STATE OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS AND DEPARTMENT OF ENVIRONMENTAL PROTECTION

310 CMR 7.75 Clean Energy Standard – Expanding the CES: The 2016 Energy Diversity Act	))))))

RESPONSE OF BROOKFIELD RENEWABLE TO REQUEST FOR WRITTEN COMMENTS ON OPTIONS FOR EXPANDING THE CES

In response to the Executive Office of Energy and Environmental Affairs' (EEA) and Department of Environmental Protection's (DEP) request for written comments in the above referenced proceeding, Brookfield Renewable ("Brookfield") is pleased to submit the following written comments.

Brookfield has a strong presence in New England, including over 1,300MW of carbon-free resources in ISO-NE and a further 1,000MW that can be imported to New England from New York and Quebec. Our renewable hydro, wind and pumped storage resources are available to help meet the energy needs and environmental objectives of Massachusetts and the region. In Massachusetts, our facilities include a 600MW pumped storage facility (Bear Swamp) and a 10MW hydroelectric facility (Fife Brook), as well as our North American System Control Center in Marlborough.

Brookfield strongly supports Massachusetts' efforts to reduce greenhouse gas emissions and to promote clean electricity sources. In particular, we support the development of the CES and again wish to thank EEA, DEP and the Department of Energy Resources (DOER) for initiating a stakeholder process to align the 83D procurement and the CES – which Brookfield has commented on previously[1] – as well as to expand CES qualification to existing resources – the focus of this submittal.

[1] *Response of Brookfield Renewable to Request for Written Comments on Aligning the 83D Procurement and the CES, October 30, 2017.*

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Options for Expanding the CES: A "Global" CES

Existing carbon-free energy resources play a critical role in mitigating the Commonwealth's reliance on greenhouse gas emitting generation, and inclusion of these resources within the CES will facilitate ongoing optimization and maintenance of these non-emitting resources through 2050 and potentially beyond. Additionally, these resources will help ensure that carbon reductions are achieved as rapidly as possible and at the least cost to consumers. As such, it is prudent for Massachusetts to proceed with an approach that values the benefits these resources deliver to the Commonwealth's renewable energy and carbon reduction policy goals.

Brookfield strongly supports including existing non-emitting generation as a qualifying resource within the CES. However, Brookfield urges the DEP to consider implementing a single CES regime open to all clean energy technologies, regardless of vintage, rather than a bifurcated CES/CES-E construct. Because the intent of the CES is, first and foremost, to achieve carbon reductions in the electricity mix, discriminating between resources based on technology or vintage adds unnecessary administrative complexities to the program and produces costlier, less efficient outcomes ultimately borne by ratepayers. Efficiently achieving the goal of the CES (i.e., Global Warming Solutions Act-mandated carbon reductions) requires designing a program centered upon the valuation of generation attributes (emissions profile), regardless of whether that attribute is associated with a new or existing resource.[2] In fact, it appears the Department has already acknowledged the value and necessity of this approach through its articulation of a mechanism to harmonize the 83D procurement and the CES. The Department proposes to modify the definition of a "clean generation attribute" within the CES to include the non-Class I attributes procured under 83D. In other words, this harmonization mechanism inherently acknowledges that vintage and technology restrictions are immaterial. Instead, it is the proper valuation of the *clean generation attribute* which enables harmonization.

Brookfield believes a "global CES" approach is both the most programmatically efficient and is capable of providing the greatest ratepayer value. Indeed, the broader the portfolio of resources qualified under the CES, the less costly the program will be. This is evident within the Commonwealth's current RPS program, which includes a more restrictive, supply-constrained Class II program. As a result, there have been ongoing shortfalls of Class II RECs and a costly reliance on the Alternative Compliance Payment (ACP) mechanism, with over 32% of Class II compliance achieved through ACP payments in 2014. This represents over 25% of total ACP payments in 2014 despite Class II demand being set at only 1.75%.[3] Nonetheless, Brookfield recognizes that the Commonwealth has an inherent interest in incenting the deployment of incremental carbon free generation. We also acknowledge stakeholder concerns that a broadly non-discriminatory "global CES" could negatively suppress the value of a Clean Energy Credit and/or qualify resources that some stakeholders may not consider truly "clean." In order to address these concerns, Brookfield recommends that a "global CES" feature a single eligibility restriction tied to resource size. A size restriction of 100 MW, for example, would enable

[2] Brookfield recommends use of NEPOOL GIS registries to appropriately track attribute creation and sale.
[3] Data is taken from the most recent annual compliance report. Massachusetts RPS & APS Annual Compliance Report for 2014, May 4, 2016.

participation from a broad and diverse portfolio of valuable new and existing resources while still accomplishing the stated goal of the DEP's proposed 1990 vintage requirement.[4]

A global CES will require – particularly for the initial years of program implementation – annual demand targets set at levels sufficient to not only retain existing assets but also to support incremental resource deployment. Achieving this outcome may require increasing CES demand targets beyond the levels currently proposed for the early years of program implementation, and adjusting accordingly thereafter. Importantly, the demand target should also be flexible to account for changing market conditions. Such flexibility could be achieved through periodic reviews (e.g., every 3 years) to determine whether to increase, decrease or leave demand targets unchanged. Price floor and ceiling values can also be established to both incentivize new and maintain existing clean energy sources, while ensuring program cost containment within specific ranges.

Lastly, a global CES framework including the components outlined above can easily co-exist with existing clean energy policies, including the Renewable Portfolio Standard and state-sponsored procurements. Collectively, these programs will enable the Commonwealth to obtain a diverse clean energy mix that not only achieves the incremental carbon reductions mandated by the Global Warming Solutions Act, but do so in an efficient, cost-effective and administratively straight-forward manner. This global CES approach also begins aligning the Commonwealth's various regulatory regimes around the concept of attribute valuation, rather than imposing other arbitrary or unnecessarily complex qualification criteria. We urge the DEP to adopt this global CES concept.

Options for Expanding the CES: the "CES-E" Without Vintage Restrictions

To the extent the DEP does not pursue a global CES and instead proceeds with a bifurcated approach for incentivizing new and maintaining existing assets, Brookfield strongly recommends that the CES-E avoid imposing an arbitrary vintage restriction in order to enable more efficient and cost-effective outcomes for Massachusetts ratepayers. Currently, the Stakeholder Discussion Document contemplates a 1990 vintage restriction to address stakeholder concerns regarding the treatment of certain technology types. However, the proposed vintage restriction could result it unwanted impacts by unnecessarily limiting the Commonwealth's ability to access valuable and competitive existing resources, including Brookfield's portfolio of hydropower resources within and adjacent to ISO-NE. Rather than implementing a vintage restriction under the CES-E, Brookfield urges the establishment of a 100 MW size eligibility restriction. A cap would qualify a larger pool of resources than the vintage restriction, enhancing overall CES-E competition and reducing ratepayer costs. The cap would also accomplish the original objective of the DEP's proposed 1990 vintage requirement.

Furthermore, abandoning a CES-E vintage restriction will prevent additional layers of discriminatory treatment for certain existing hydropower facilities. For example, hydropower facilities installed prior to December 31, 1997 that are larger than 7.5 MW are currently ineligible to participate in the state's RPS program. The current CES-E proposal would qualify

[4] *310 CMR 7.75: Clean Energy Standard Review of Options for Expanding the CES Stakeholder Discussion Document, pg. 5.*

only a small subset of existing hydropower facilities larger than 7.5 MW (i.e., only those built after 1990). This creates strange and irregular distinctions in the valuation of existing hydropower while decreasing the role that these resources can play in cost-effectively achieving the mandates of the Global Warming Solutions Act.

Options for Expanding the CES and CES-E: Vintage Restrictions, Carbon Incrementality & FERC Relicensing

Should the DEP choose to implement the CES-E and CES with specific vintage restrictions, resource eligibility should align with the 83D procurement. Given that the 83D procurement and the CES were explicitly designed to achieve the same GWSA-mandated carbon reduction goals, and given that the 83D procurement only contained the requirement that an eligible transaction represent incremental energy to the Commonwealth (i.e., no vintage), it makes sense for the DEP to adopt a harmonized approach for resource eligibility under the CES and CES-E, respectively. At a minimum, the DEP should qualify any non-emitting incremental energy, as defined under 83D, based upon the date the resource or transaction became or becomes incremental to the ISO-NE system, rather than the date of commercial operation. Put another way, the CES-E should value and qualify any clean or non-emitting generation resource that was incremental since 1990 -- or, in the case of the CES, any clean or non-emitting generation that will be incremental in the future -- regardless of vintage or technology type. For the CES-E, this includes qualifying any non-emitting resource providing incremental change to the system after 1990 and before 2011 (the currently proposed CES eligibility date). While for the CES, this includes qualifying any 83D resource whether procured under 83D or not, including transactions leveraging existing non-emitting resources to firm the output of incremental Class I resources, as well as non-emitting resources that have not delivered to the ISO-NE electricity grid over the prior three years.

In addition, it is imperative that Federal Energy Regulatory Commission's (FERC) relicensing dates for hydro facilities and commercial operation dates be treated identically for the purpose of determining resource eligibility under both the CES and CES-E. The FERC hydro relicensing process is required for continued operation of all non-federal hydro generation beyond the expiration of the initial license. Issuance of a new FERC license typically occurs after a five year or longer, multi-million dollar process that requires facility owners to perform extensive environmental studies and engage all local stakeholders. The terms of a new license frequently require capital investments and infrastructure upgrades that can cost millions of dollars more while also imposing new operational restrictions on the unit. A facility that is granted a new license effectively operates as a new resource, meeting the highest and best state and federal environmental standards of the day, but also often incurs an 8-10% loss in facility energy output as a consequence. Given this exhaustive FERC process that is unique to hydropower facilities, Brookfield believes that the CES should treat a re-licensed facility identically to a new hydropower facility achieving commercial operation within the same year. Simply put, if either the current CES vintage restriction (after December 31, 2010) or the proposed CES-E vintage restriction (1990 or later) is retained, a hydropower facility's eligibility under both programs should be determined based upon the date of re-licensing rather than the date of commercial operation.

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Additional CES-E Design Considerations

Several other CES-E design considerations are also worthy of consideration. First, rather than requiring "retail electricity sellers to annually purchase clean energy certificates ("CEC-Es") from existing clean generators in amounts consistent with recent historical data, with quantities specified in MWh for each category of existing clean generator (e.g., hydroelectric generators in Canada),"[5] more competitive outcomes will be achieved if the CES-E features a single annual aggregate demand target allocated to individual LSEs based on load share. This approach simplifies the CES-E concept and promotes more agnostic and cost-effective results by creating a single product pool instead of slicing up the aggregate numbers to reflect historical deliveries by resource type (potentially requiring LSEs to procure more costly resource types over more competitive offerings).

Additionally, with regard to an ACP under a CES-E, the ACP value must be enough to incentivize an LSE to actually procure existing resources. The ACP must also be enough to ensure that the intended optimization and maintenance of existing non-emitting resources occurs. If the ACP is set too low, LSE's maybe more inclined to pay the ACP rather than to actually procure, and/or the valuation may be insufficient to encourage existing non-emitting resources to continue operating and supporting the Commonwealth's carbon reduction goals. An ACP set at 10% of the Class 1 ACP proposed in the Stakeholder Discussion Document will almost certainly encounter these issues, hamstringing the DEP's efforts to maintain these existing resources for the long term. Brookfield therefore recommends the ACP be tied to a higher percentage of Class I ACP.

Conclusion

In conclusion, Brookfield is especially supportive of a framework that offers adequate recognition and value for existing non-emitting resources, given the vital contribution these resources provide toward cost-effectively and efficiently meeting carbon reduction mandates. For the reasons outlined above, we recommend this be accomplished by implementing a single CES regime open to all clean energy technologies, regardless of vintage, rather than a bifurcated CES/CES-E construct. Such an approach does not distinguish between new and existing resources and instead focuses on procurement of the non-emitting attributes offered by clean energy resources, regardless of vintage.

To the extent the DEP does not adopt a global CES and proceeds with a bifurcated CES/CES-E approach, Brookfield urges the DEP to implement a CES-E that does not impose vintage restrictions. Enabling all otherwise-eligible existing resources to compete under the CES-E, without vintage limitations, will surface the greatest value to ratepayers. In this circumstance, additional recommended CES/CES-E design components include:

- Under a design inclusive of vintage restrictions, consider the date a non-emitting resource became or becomes incremental to the ISO-NE system as the vintage date.

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[5] *310 CMR 7.75: Clean Energy Standard Review of Options for Expanding the CES Stakeholder Discussion Document, pg. 4.*

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- Allow hydro resources to qualify under a CES/CES-E framework based upon the date of FERC relicensing.
- Design a single CES-E demand target that is open to all qualified resources rather than establishing procurement categories by resource type.
- Establish a CES-E ACP value that appropriately allows for the intended optimization and maintenance of existing non-emitting resources.

Thank you again for the opportunity to comment on this important initiative. Please do not hesitate to contact us should you have any questions.

Bay State Hydropower Association

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Via Email (climate.strategies@state.ma.us)

November 30, 2017

Massachusetts Dept. of Environmental Protection
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Re: Comments: MassDEP Proposed Expansion of the Clean Energy Standard: Stakeholder Process

Dear Mr. Space:

On behalf of the Bay State Hydropower Association ("BSHA" or the "Association") and its members, I want to thank MassDEP for the opportunity to submit written comments in this stakeholder process examining the need and opportunities for expanding the Clean Energy Standard.

The Association was established in 2007 with the goal of advancing the use of hydropower, an indigenous and clean energy source, in Massachusetts and the region that positively affects the environment and energy future of the Commonwealth. The BSHA is comprised of hydropower facility owners and operators throughout Massachusetts; it represents nearly 90 percent of the hydro facilities in the state, most of which are small facilities.

Since the BSHA's founding, it has advanced in multiple forums the need to support existing hydropower facilities, particularly those of a local smaller size. In this context, the Association filed testimony in November 2016 in the Department's initial stakeholder process highlighting this need. While its members own and/or operate predominately smaller facilities, collectively they make up a significant slice of Massachusetts' existing clean energy supply. If that supply were to be curtailed - by shut downs, reduced production due to maintenance issues, or their clean energy attributes being claimed by other states – the Commonwealth would have to back fill this clean energy gap with newer

and more costly clean energy supply in order to achieve the mandated goals of the Global Warming Solutions Act ("GWSA"). The CES clean energy goals in each decade (and by 2050) rest on the foundation of our existing clean energy supply, particularly hydropower which has a long production life span and can be counted on between now and 2050.

The Association's members believe the Department's examination of existing clean energy supply in the context of the CES, which undergirds new supply to achieve the overall reduction goals of the Commonwealth, is essential for good policy and practical reasons.

Context

The Association wants to begin these comments by providing context for its views. First, hydropower is not a "build it and leave it" clean energy generation source. Significant operational and maintenance costs are incurred yearly to sustain efficient production, avoid costly shut downs, protect water flow and the environment, and repair equipment and replace broken or worn out components. These annual operational costs are incurred by Members as they have faced substantial revenue decline due to lower wholesale energy prices and ignoring the non-carbon emission values of these facilities.

Second, while it is true that fossil generators have to comply with RGGI, which presumably makes that energy more costly, this has no bearing on revenue to Massachusetts hydropower owners and operators. Their output payments are the extremely low wholesale regional clearing price of energy. Of course in some instances Class II RPS revenue is the saving grace for smaller hydropower owners and operators. But only a small subset of hydropower facilities can qualify for this revenue source because of the very small size limitation and the severe regulatory hurdles. Existing clean energy sources, particularly hydropower generation, are not at a competitive advantage vis-à-vis fossil generation as the Stakeholder Discussion Document implies. (See, p. 3.)

Revenue for existing clean hydro generation from a clean energy program, either by including existing hydro in the CES program or creating a new category added to the CES, e.g. "CES-E," is needed to provide continued and reliable clean power for Massachusetts and the region. This clean power is needed for both power supply and its zero emissions attribute – essential for compliance with the Global Warming Solutions Act and the Governor's executive order. Without continued clean energy supply from existing hydro facilities, Massachusetts will either be unable to achieve GWSA mandated goals or will need to achieve such goals at very high costs to electric ratepayers. (See, p. 3.)

Comments

Massachusetts should adopt a new clean energy standard category for existing clean energy supply. In a sense this category could be viewed as conceptually akin to the RPS classes which reflect the need for both new and existing supply. In this context, a new category would have its own eligibility criteria, alternative compliance payment, and annual supplier compliancy demand. Here is an outline of the BSHA suggestion for such a program:

- clean power attributes not claimed elsewhere;
- in Massachusetts, the New England region, or contiguous regions;
- facility size limited;
- realistic alternative compliance payment; and
- set an annual demand allocated to suppliers by their load.

This approach would be through a competitive market, unlike the idea in the straw proposal for a supplier to purchase CES-E certificates in amounts consistent with historic information for each type of clean energy generation. This approach is not unlike Class II RPS for existing small hydropower facilities, where there is a marketplace that creates a competitive price for the clean energy credits. This ensures moderation of costs to ratepayers while ensuring the continued supply of clean energy from existing producers as the base for new supply.

The program should <u>not</u> have a vintage date limitation <u>for hydropower facilities</u> as the straw proposal contains, e.g. 1990. (A vintage date for other existing large scale clean energy sources should be considered for a variety of reasons.) The goal of the GWSA is to achieve mandatory emission reductions and that requires <u>stable</u> reliable renewable clean energy, whether new or existing. All such supply, within a size limitation, will be needed to contribute to the achievement of the Commonwealth's aggressive emission reduction and renewable energy goals.[1]

Both a facility size limitation and technology limitation are essential to make sure that very large and geographically concentrated generation does not overwhelm the market, to produce clean generation in diverse locations for reliability and stability of supply, and to

[1] The straw proposal suggests that a goal of including existing clean energy supply is to provide support for this long term supply. Focusing a CES-type program, e.g. CES-E, on existing smaller hydropower generation will significantly contribute to this objective. Hydropower facilities are clearly the most durable clean energy sources historically, with some facilities multiple decades old – albeit with significant annual maintenance and capital improvements. This is unlike solar or wind facilities, which have more limited life spans. Support for smaller hydropower generation is a good approach for achieving the Department and GWSA's 2050 goals.

make sure existing supply remains economical and receives the benefit of the credits. This differentiation by size and/or technology is consistent with other Massachusetts energy programs.[2]

During the original stakeholder process that resulted in the Department's CES regulations, it was suggested by commentators that a 100 MW size limit would be appropriate for inclusion of existing clean energy generation in the CES. This 100 MW size is suitable as a demarcation line ensuring support for smaller clean energy generators and providing diversity of supply for reliability purposes in a new category of CES – CES-E.

The CES-E straw proposal suggests that the clean energy supply required of a supplier be limited to a geographically historic limit. This is an unsound approach which, when compounded by the proposal's vintage date, leaves smaller existing and stable clean energy supply out in the cold and benefits single larger and geographically distant supply - and for ratepayers, this results in a higher cost.

A more dynamic and fruitful approach would be to have an annual supply requirement. This produces a number of positive effects. It produces a competitive marketplace with an annual demand against which qualifying facilities seek buyers. This results in lower costs and a more diverse universe of clean energy generation producers. In this context, the Department should adopt a realistic alternative compliance payment (ACP) that provides a competitive bandwidth to support the competitive marketplace. The ACP suggested in the straw proposal is inadequate in this regard. Since both existing and new clean energy supply are essential to meet the GWSA mandated goals, the ACP should be the same for both categories – CES and CES-E.

Conclusion

The BSHA and its members appreciate the Department focusing on existing clean energy resources and their significant contribution to the clean energy supply that Massachusetts electric customers enjoy. This supply is the foundation on which new supply adds toward achieving the GWSA mandated emission reduction goals. The clean energy produced by existing or new generation is the same in getting to the Commonwealth's objectives.

[2] For example, the RPS program for Class I and Class II has size limitations for a particular technology. Additionally, for example, the RPS statute allows the Department of Energy Resources to set supplier percentage requirements based on technology and fuels used to produce clean energy for Class II renewable energy credits (RECs). See. M.G.L. Chapter 25A, section 11F, subsections (c), (d) and (e).

The Association urges the Department to adopt a clean energy standard that recognizes the equality of new and vintage clean energy generators and the combined value they represent.

Sincerely,

Thomas A. Tarpey, President
Bay State Hydropower Association

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November 30, 2017

By Electronic Mail (*climate.strategies@state.ma.us*)

Commissioner Martin Suuberg
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Subj: Comments re: Proposed Changes to 310 CMR 7.75 Clean Energy Standard Relating to Municipal Utilities and Existing Clean Generators

Dear Commissioner Suuberg,

Please accept the following comments by Conservation Law Foundation ("CLF") regarding the Department of Environmental Protection's ("DEP's") proposed revisions to 310 CMR 7.75 as noticed by DEP on October 3, 2017.[1] Responding to issues 2 (*Options for Expanding the CES: The "CES-E"*) and 3 (*Options for Expanding the CES: Municipal Utilities*) raised therein,[2] CLF's comments explained in detail herein can be summarized as follows:

Regarding Municipal Utilities

- DEP should revise the 310 CMR 7.75 Clean Energy Standard ("CES") to require compliance by municipal utilities ("Munis"),[3] without exception, as Retail Energy Sellers subject to the CES.
- DEP should allow Munis to settle for purposes of CES compliance any clean energy attributes they own as the result of an existing ownership interest in, or long-term contracts with, generation that otherwise would qualify as Clean Generation in the absence of the vintage requirement in 310 CMR 7.75(7)(a)(2).
- DEP should require that Munis may only claim clean or renewable energy (or related emissions profile) for which they own the associated clean or renewable attribute.
- DEP should require Munis to comply with the existing 310 CMR 7.75(4)(a) Table A schedule of required clean energy sales no later than 2035.

[1] DEP, *310 CMR 7.75: Clean Energy Standard Review of Options for Expanding the CES Stakeholder Discussion Document* (Oct. 3, 2017) ("CES Discussion Docment").
[2] *See id*. at 2-5 (regarding the CES-E), 5-7 (regarding municipal utilities).
[3] The term "Munis" herein includes all municipal utilities in the Commonwealth including Municipal Electric Departments ("MEDs"), Municipal Light Boards ("MLBs"), and Municipal Light Plants ("MLPs"), *see id.* at p.1 (defining "municipal utilities" for purposes of this public stakeholder discussion).

Regarding Existing Clean Generators

- DEP should not implement its proposed CES-E.DEP should instead revise the CES to include a requirement that DEP continue to study how to best account for existing clean generation, initiate a public process to consider appropriate approaches and that it finalize a rulemaking or other mechanism to do so in 2019 (effective for Jan. 1, 2020).
- Simultaneously, DEP should pursue in conjunction with DOER and other relevant agencies of the Commonwealth a regional, market-based mechanism like the dynamic Forward Clean Energy Market developed through the NEPOOL IMAPP process and currently being vetted with the states and ISO-NE (likely together with an expanded CES modified to account for such a market) which would provide a longer term solution and could achieve the stated goal for the CES-E more cost-effectively and with greater emissions reductions.

A. DEP SHOULD REQUIRE MUNIS TO COMPLY WITH THE CLEAN ENERGY STANDARD.

DEP can and should require Munis to participate in the CES. DEP's assessment of the law – that it presently has the statutory authority, pursuant to the GWSA and other laws, to regulate Muni greenhouse gas ("GHG") emissions and to include Munis in the CES[4] – is correct.

1. The CES Should Be Revised to Include Munis as Retail Energy Sellers subject to the CES.

The CES should be revised to include Munis as Retail Energy Sellers subject to the CES in essentially the same manner – and for the same reasons – that DEP originally proposed in its Dec. 16, 2016 draft of 310 CMR 7.75 ("Section 7.75"). Munis provide – through self-generation, long-term contract, spot market purchases, or otherwise – almost 15% of the electricity consumed in the Commonwealth.[5] In doing so, they are directly responsible for the release of millions of tons of GHGs each year into the atmosphere, emissions included in the inventory of "statewide greenhouse gas emissions" required by the GWSA, and which are subject to the GWSA's mandatory and enforceable emissions

[4] EEA/DEP, *Response to Comment on: 310 CMR 7.74 Reducing CO2 Emissions from Electricity Generating Facilities [&] 310 CMR 7.75 Clean Energy Standard* (August 2017) ("*Response to Comment*"), 18-20 (GWSA expressly includes Munis and gives EEA and DEP the authority, without exception, to regulate Munis for purposes of setting emissions levels and limits on the electric power sector).
[5] MAPC, *Municipal Light Plants in Massachusetts: Spotlight on Clean Energy Initiatives* (July 2016), 2 (Munis provided at least 13% of the state's electricity in 2014).

reduction limits.[6] Indeed, the Commonwealth has already determined – correctly – that the state cannot meet its long-term GWSA emissions reduction requirements unless emissions associated with the sale of electricity by Munis are regulated and reduced.[7] As a result, the CES must be revised to include Munis as Retail Energy Sellers subject to the CES, at least as of Jan. 1, 2020.

2. The CES Should Be Revised to Allow Munis to Settle for Purposes of CES Compliance Certain Clean Energy Attributes They Own.

Because Munis are allowed to own generation assets and also frequently enter into substantial long-term contracts for electricity supply, many have existing ownership interests in, or long-term contracts with, generation assets that otherwise would qualify as Clean Generation except for the vintage requirement in 310 CMR 7.75(7)(a)(2). Of particular relevance here are the minority ownership interests of some thirty Munis in the both the Seabrook Station and Millstone Unit 3 nuclear facilities,[8] and the ownership interests of certain Munis in, or existing long-term power purchase agreements with, existing non-RPS hydropower facilities.

In order to fairly accommodate Munis into the CES, then, DEP should modify the CES to account for such existing ownership interests or long-term contracts in a manner parallel to that proposed by DEP for including in the CES the attributes of energy procured pursuant to the Energy Diversity Act of 2016 (Chapter 169 of the Acts of 2008, Section 83D).[9] That is, DEP should revise the CES as necessary (likely by modifying the

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[6] G.L. c. 21N, §§ 1 ("statewide greenhouse gas emissions" include without exception "all emissions of greenhouse gases from the generation of electricity delivered to and consumed in the commonwealth, accounting for transmission and distribution line losses, whether the electricity is generated in the commonwealth or imported" (emphasis added)) and 3 (requiring declining annual emissions limits, including expressly: "[e]missions levels and limits associated with the electric sector").

[7] *See, e.g.*, DEP, *Background Document On Proposed New And Amended Regulations 310 CMR 7.00 [&] 310 CMR 60.00* (Dec. 16, 2016), 27 ("In 2050, consistent with the GWSA requirement to address all electricity emissions, MLPs will be required to deliver the same percentage of clean energy as all other retail sellers."); *Response to Comment* at 19 ("Given the central role of the electric sector in achieving the required GWSA GHG emissions reductions of 25% and at least 80% by 2020 and 2050, respectively, it would be inconsistent with the goals of the entire GWSA scheme to exempt parts of the electric sector from regulations that require reductions in GHG emissions from that sector.").

[8] Twenty eight MMWEC participants (Ashburnham, Boylston, Braintree, Danvers, Georgetown, Groton, Hingham, Holden, Holyoke, Hudson, Hull, Ipswich, Littleton, Mansfield, Marblehead, Middleborough, Middleton, North Attleborough, Paxton, Peabody, Reading, Shrewsbury, South Hadley, Sterling, Templeton, Wakefield, West Boylston and Westfield) collectively own 11.59% of the Seabrook facility and (except for Braintree) a 4.8% ownership interest in Millstone Unit 3; Taunton Municipal Lighting Plant (0.1%) and the Hudson Light & Power Department (0.08%) also have an ownership interest in the Seabrook facility.

[9] EEA/DEP, *Draft Amendments to 310 CMR 7.75(2) and (6)* (Nov. 3, 2017); *see also*, CLF, *Comments re: Options for Expanding the CES: The 2016 Energy Diversity Act* (Oct. 30, 2017) (recommending a similar approach).

Section 7.75(2) definition of "Clean Generation Attribute" as well as Section 7.75(6)(b)(3)) to allow Munis to settle for purposes of CES compliance any clean energy attributes they own as the result of – and only for the duration of – an existing ownership interest in, or long-term contracts with, generation that otherwise would qualify as Clean Generation except for the vintage requirement in 310 CMR 7.75(7)(a)(2).

Doing so would consistently and fairly allow Munis who own clean energy attributes as the result of their unique, pre-existing ownership/long-term contracting abilities among Retail Energy Sellers to participate in the CES and help achieve the emissions reduction goals of the CES without undue cost or burden.

3. DEP Must Ensure Munis Stop "Double-Counting" Power from Clean Generation They Own, But Whose Environmental Attributes They Do Not Retain.

In response to DEP's December 2016 proposal to include Munis in the CES, at least fourteen Munis argued that they should be given permission to continue "double counting" energy from generation they control, but whose environmental attributes they profitably sell and thus no longer own.[10]

Regardless of how Munis are made subject to the CES, DEP must ensure that this practice – one that the federal law considers "deceptive" – ceases and, going forward, is strictly prohibited. Double counting of environmental attributes directly undermines the Commonwealth's long-standing and (otherwise) successful Renewable Portfolio Standard program. It directly depresses demand for new renewable generation, by doubling apparent, but not actual, supply.

The practice is widely considered to be active deception that is prohibited under

[10] In their submitted public comments, several Munis appear to admit that they currently double-count: claiming for themselves significant percentages of "clean" energy (that is, "Sales from Non-Emitting" or "zero-carbon" generation sources), *see* John P. Coyle, *Comments on Behalf of Belmont Municipal Light Department, Braintree Electric Light Department, Concord Municipal Light Plant, Georgetown Municipal Light Department, Groveland Electric Light Department, Hingham Municipal Lighting Plant, Hudson Light And Power Department, Littleton Electric Light & Water Department, Middleborough Gas & Electric Department, Middleton Electric Light Department, Norwood Light & Broadband Department, Rowley Municipal Lighting Plant, Wellesley Municipal Light Plant, and Westfield Gas & Electric Department* (Feb. 24, 2016) ("*Muni Comments*"), at 9-12, while also stating that they sell "renewable energy credits . . . [in order] to moderate the contract prices for acquiring entitlements in [the same] zero-carbon resources," *id.* at 14; *accord, e.g.*, Braintree Electric Light Department, *2014 Annual Report*, at 2 (claiming "our non-greenhouse gas emitting energy portfolio is up to 28% of our total power supply" without specifying whether RECs from included solar and wind generation are retained or sold). Remarkably, these same Munis argue that they should be allowed to continue doing so after being included in the CES. *Muni Comments*, at 17.

federal and state law.[11] Accordingly, DEP must expressly ensure that Massachusetts Munis are no longer allowed to do so.

4. In the Absence of Evidence Indicating Specific Need Otherwise, DEP Should Require Munis to Fully Comply with the CES No Later Than 2035.

While some twenty-four Munis have to date actively opposed their inclusion in the CES,[12] a majority of towns served by Munis (twenty-six of fifty) have publicly indicated no such opposition.[13] And although opposing Munis claim they need special consideration due to various ownership interests and long-term power purchase agreements, they have to-date provided no credible evidence publicly supporting their related assertion that they cannot efficiently and cost-effectively comply in 2020 (the first year DEP has proposed to require their active compliance) with the existing 310 CMR 7.75(4)(a) Table A schedule of required clean energy sales (20% of all retail sales with clean generation attributes). Indeed, they have instead submitted evidence that indicates many Munis could meet or exceed existing CES compliance levels today.[14]

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[11] 16 C.F.R. § 260.15 ("Renewable energy claims."); *id.* at § 260.15(a) ("It is deceptive to misrepresent, directly or by implication . . . that a service uses renewable energy."); *id.* at § 260.15(d) ("If a marketer generates renewable electricity but sells renewable energy certificates for all of that electricity, it would be deceptive for the marketer to represent, directly or by implication, that it uses renewable energy. . . . Example 5: A toy manufacturer places solar panels on the roof of its plant to generate power, and advertises that its plant is '100% solar-powered.' The manufacturer, however, sells renewable energy certificates based on the renewable attributes of all the power it generates. Even if the manufacturer uses the electricity generated by the solar panels, it has, by selling renewable energy certificates, transferred the right to characterize that electricity as renewable. The manufacturer's claim is therefore deceptive. It also would be deceptive for this manufacturer to advertise that it ''hosts'' a renewable power facility because reasonable consumers likely interpret this claim to mean that the manufacturer uses renewable energy. It would not be deceptive, however, for the manufacturer to advertise, 'We generate renewable energy, but sell all of it to others.'"); *accord, e.g.*, State of Vermont Office of the Attorney General, *Guidance for Third-Party Solar Projects* (available at: http://www.ago.vermont.gov/assets/files/PressReleases/Consumer/Guidance%20on%20Solar%20Marketing.pdf) (instructing that it is deceptive to state *or imply* an asset as "renewable," "clean," or "green" if the RECs from that asset are sold).

[12] *See Muni Comments*; joint filed comments (Feb. 24, 2016) of Danvers Electric Division, Middleborough Gas and Electric Department, Norwood Municipal Light Department, Reading Municipal Light Department, Taunton Municipal Lighting Plant, West Boylston Municipal Light Plant; and individual filed comments (Feb. 24, 2016) of Princeton Municipal Light Department, Shrewsbury Electric & Cable Operations, and Sterling Municipal Light Department Board of Commissioners.

[13] Five Munis and the Massachusetts Municipal Wholesale Electric Company filed comments indicating no opposition to the inclusion of Munis in the CES. *See* filed comments (Feb. 24, 2016) of Groton Electric Light Department, Holden Municipal Light Department, Mansfield Municipal Electric Department, Templeton Municipal Light and Water Plant. No public comments regarding this issue have been filed to date by the remaining 21 Muni-served towns.

[14] *See Muni Comments*, at 10 (indicating at least seven Munis in 2013 had energy sale portfolios that, in the absence of double-counting violations, would already exceed CES compliance levels for 2018, the first year of required program compliance).

To the extent, however, that the ability of certain Munis to comply with the existing CES compliance schedule for all other Retail Energy Sellers is limited by existing long-term contract commitments, and specific evidence of such limitations is produced, CLF does not oppose DEP's development of one or more Muni-specific CES compliance schedules based on such evidence. Based on our knowledge of industry practice regarding long-term energy supply contracts, and given the urgent need to reduce GHG emissions in the electricity sector in order to ensure state compliance with the GWSA, DEP should ensure that any such Muni-specific compliance schedule(s) require and result in all Munis meeting the existing 310 CMR 7.75(4)(a) Table A schedule of required clean energy sales by 2035 (i.e., 50% of all retail sales with clean generation attributes).[15]

B. RATHER THAN PURSUING THE PROPOSED CES-E, DEP SHOULD WORK TO INCORPORATE EXISTING CLEAN GENERATORS INTO ITS GWSA STRATEGY USING A REGIONAL MARKET.

In its CES Discussion Document, DEP poses two related questions: "*Is the CES-E approach described [herein] an appropriate approach for supporting existing clean generators*?" and "*Are there other viable approaches*?" In short, the answers to those questions are: No, it is not; and yes, there are. As a result, CLF strongly recommends that DEP not implement of further pursue its sketch proposal for a CES-E, and instead, revise the CES to mandate a final rulemaking or other mechanism no later than December 31, 2019 (effective Jan. 1, 2020) that will incorporate and account for existing clean generators using the regional wholesale electricity markets.

1. The Proposed CES-E Is Problematic and Should Not Be Implemented.

CLF applauds DEP's appropriate attention to, and concern regarding, the quantitative implications of the Commonwealth's GHG Inventory regarding retention of services provided by existing clean generators.[16] However, the backward-looking, inventory driven mechanism DEP has begun to propose – the "CES-E" – is both incomplete and potentially fatally flawed.

Importantly, it is not at all clear how DEP would calculate the annual existing

[15] Because the term of PPAs and other long-term energy supply agreements are typically no more than 20-years, the vast majority of such agreements in place today likely will have expired by the end of 2034, some 17 years from now.

[16] *See* CES Discussion Document at 4 (identifying approximately 35% of Massachusetts' energy supply portfolio as "clean" based on GHG Inventory accounting of emissions associated with energy generated or consumed in-state).

clean energy certificate ("CEC-E") purchase requirement it is considering imposing on Retail Energy Sellers, and do so by type of generator (presumably only nuclear and non-RPS hydropower) and region (presumably only NH (Seabrook), NY and Canada) based on historical averages while also allowing and accounting for generator retirements, whether at their anticipated end of service-life, or before. And by mandating such a backward-looking "historical average" approach, DEP would risk subsidizing existing clean generation that is less efficient and more costly than newer clean energy that could deliver the same environmental attribute and outcome – the provision of low- or zero-carbon electricity – more cheaply using new (e.g., more proximate off-shore wind with fewer trans mission line losses) or improved (e.g., for hydropower) technology.

Also, the "after 1990" commercial operation date proposed as a qualifying criteria for would-be CES-E generators is arbitrary in the context of the proposed need and very likely counter-productive. To the extent Massachusetts received electricity in 1990 from existing clean generators, the low or zero emissions associated with that power is included in the Commonwealth's GHG Inventory baseline. As a result, a loss of those resources – which would effectively raise our baseline and require new offsetting electricity to be secured – would be as detrimental to the state's GWSA compliance efforts as would be the loss of a similar asset whose electricity has contributed to emissions reductions since 1990. But in the absence of data regarding the identity and age (other than Seabrook Station) of existing clean generators DEP considers "in" our supply portfolio since 1990, the size of that potential risk – or the post-1990 one DEP appears more focused on – cannot be assessed.

Finally, the narrow "inventory focus" of the proposed CES-E idea is inaccurate, or at least unhelpful, for making policy regarding what amounts to state support of specific generating assets. For example, although for purposes of GHG Inventory accounting it can be said that Massachusetts receives no power from Millstone Unit 3, that is not in fact the case. Some twenty-seven Massachusetts Munis do receive power from that facility as a result of their minority (4.8%) ownership in it,[17] something the GHG Inventory will have to be adjusted to account for (to the extent it does not already do so) as a result of extending CES compliance obligations to Munis. Thus, as proposed, the CES-E would appear to subsidize, without sufficient justification, one existing source of zero-carbon electricity (Seabrook Station) at the expense of another (Millstone Unit 3) without regard for their current profitability[18] or individual ability (due to expected

[17] *See supra* note 8.

[18] The Millstone and Seabrook facilities are among the most profitable – if not the top two most profitable – nuclear facilities in the United States. *See* Geoffrey Haratyk, *Early Nuclear Retirements in Deregulated U.S. Markets: Causes, Implications and Policy Options* (MIT CEEPR Mar. 2017), 6 (listing Millstone and Seabrook respectively as the most profitable and second most profitable nuclear power facilities in the U.S.).

federal license expiration)[19] to contribute to the GWSA's 2050 emission reduction mandate. The same is true regarding existing hydropower facilities in New England and neighboring areas (NY, Ontario, Quebec, and New Brunswick) which began operating before 1990 and, with facility service lives upwards of 100 years, could be reasonably expected to continue operating through and beyond 2050.

2. A Regional Market Approach Would More Effectively and Efficiently Provide a Long Term Solution for Incorporating Existing Clean Generators Into DEP's GWSA Emissions Reduction Strategy.

The necessary, or at least very likely, flaws inherent in the proposed CES-E concept can be avoided, and the goals for the program implemented more efficiently and cost-effectively, by using a regional market mechanism. Such an approach would be designed to unbundle and deliver via a competitive mechanism both the electricity and the desired environmental attributes that all clean generators – existing and new alike – can offer, and to do so at least cost. And it would be consistent with, and materially advance, the important GHG accounting goals DEP is pursuing by delivering to Massachusetts clean energy credits, and the exclusive ownership rights associated with them, for all clean generation that is delivered to and consumed in the Commonwealth for the next thirty three years and beyond.

Such proposals were advanced by CLF and others in the New England Power Pool's ("NEPOOL") recent Integrating Markets and Public Policy ("IMAPP") effort. One proposal, the Dynamic Forward Clean Energy ("DFCEM") market, *see* Exhibit A, continues to gain followers as it is vetted among states, ISO-NE and other stakeholders. The DFCEM would allow Massachusetts, together with other states in the region, to procure clean and renewable electricity (measured in delivered megawatt-hours) annually via a central market administered by ISO-NE in the amounts required to meet its GWSA emissions reductions goals. And by using such a market mechanism, the Commonwealth: would gain the ability to procure such resources at least cost, while retaining or retiring existing resources and attracting new ones; would gain, and enjoy the economic benefit of, increased visibility of competitive prices by placing all emissions-reducing resources on equal footing; and would be able to share emissions compliance costs with other states fairly and in proportion to each state's climate and energy laws and regulations.

Key elements and benefits of the DFCEM mechanism include the following:

[19] Seabrook Station's licensed to operate expires on March 15, 2030; Millstone Unit 3's license expires on November 25, 2045. *See* U.S. NRC, *Operating Nuclear Power Reactors (by Location or Name)* (*available at*: https://www.nrc.gov/info-finder/reactors).

- Auction would procure the clean energy attribute only (not bundled with energy);

- Purchases via this market would fulfill majority of the Commonwealth's clean energy needs, but possibly less than 100% (as needed to accommodate other policy initiatives);

- Mechanism would enable competition among all clean energy resources to yield least cost portfolio to meet the Commonwealth' GWSA mandate;

- Would price clean energy attributes and reward clean energy generators based on their ability (in time and location) to displace existing GHG emitting resources.

- Forward auction could procure two (or more) differentiated clean energy products based on cost:
    - "Base" product for all existing and new clean and renewable energy resources, and
    - "Targeted" product for certain preferred clean or renewable energy resources;

- Would provide a 1-year price lock for existing resources and a longer term price lock for new resources (comparable to ISO-NE's current Forward Capacity Auction, but longer to help ensure financability of new projects) in order to ensure efficient and sufficient price support for clean energy generators.

- States (likely via their electric distribution utilities and other load-serving entities) would submit demand bids that specify the quantity needed, and the price they are willing to pay; proposed auction mechanism could also use an advanced and efficient sloping demand curve;

- Would work seamlessly with existing ISO-NE energy and ancillary service markets ensuring Massachusetts clean energy purchases are fully incorporated into ISO-NE markets (removing risk of capacity overpayment).

Initial quantitative modeling by the Brattle Group indicates that the DFCEM would allow Massachusetts to procure the clean energy it requires for GWSA compliance at a savings of over $200 million *annually* while achieving emissions reductions of up to 350,000 tons

more than under current procurement practices.[20] And because the DFCEM would deliver required clean energy attributes annually and with clear record of ownership (comparable to RECs today), it would achieve those cost and emissions reduction benefits while facilitating direct accounting in the GHG Inventory of all clean energy purchased for the Commonwealth.

Because of flaws inherent in (or likely to occur with) the proposed CES-E, and because a mechanism a regional market solution like the DFCEM: (a) should more efficiently and cost-effectively achieve the end-state DEP would seek to achieve via the CES-E, and (b) is already actively under consideration by NEPOOL and regulators across New England, CLF recommends that:

- DEP should not implement its proposed CES-E, and instead
- DEP should revise the CES to include a requirement that it continue to study how to best account for existing clean generation, initiate a public process to consider appropriate approaches and that it finalize a rulemaking or other mechanism to do so in 2019 (effective for Jan. 1, 2020);
- Simultaneously, DEP should pursue, in conjunction with other relevant agencies of the Commonwealth, a regional, market-based mechanism like the DFCEM to be implemented and run by ISO-NE in conjunction with the states and NEPOOL.

Sincerely,

CONSERVATION LAW FOUNDATION

By its Senior Attorney

David Ismay

Enclosure (Exhibit A: Brattle Group (Presentation), *A Dynamic Clean Energy Market in New England* (Nov. 2017))

[20] *See* Ex. A at 17 (assuming Massachusetts shares in modeled regional savings in rough proportion to its share of regional load).

A Dynamic Clean Energy Market in New England

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NextEra Energy Resources
National Grid
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THE Brattle GROUP

Contents

Overview

The Forward Clean Energy Market

- **Objective:** Reduce state carbon emissions at reduced cost
- **Customer Savings:** $450 million annually ($3.60/MWh) with CO_2 emissions down by 740,000 tons per year relative to current practice (preliminary modeling results)
- **Mechanism:** States buy clean energy through a better auction and better product

Overview

A Better Auction

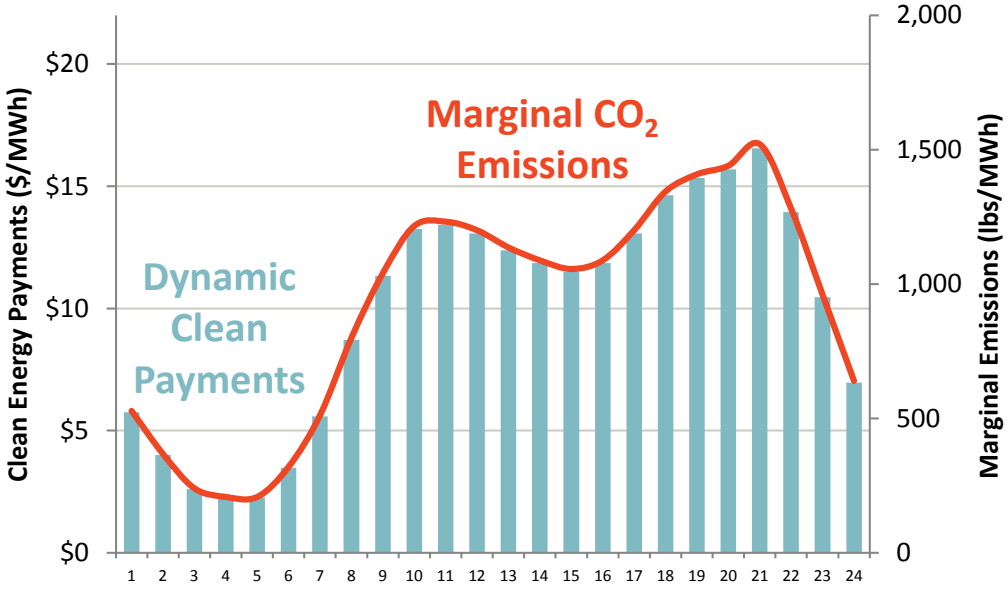
- Designed to **Keep States in Control**
- **Harnesses Competition** between new and existing resources of all types
- Designed to **Ensure Financeability** of new investments

Overview

A Better Product

- **Dynamic payments** incentivize carbon reductions
- **Enables storage** to enter the market and displace emissions
- **Operates well** with existing markets

Dynamic Clean Energy Payments Designed to Maximize Carbon Abatement



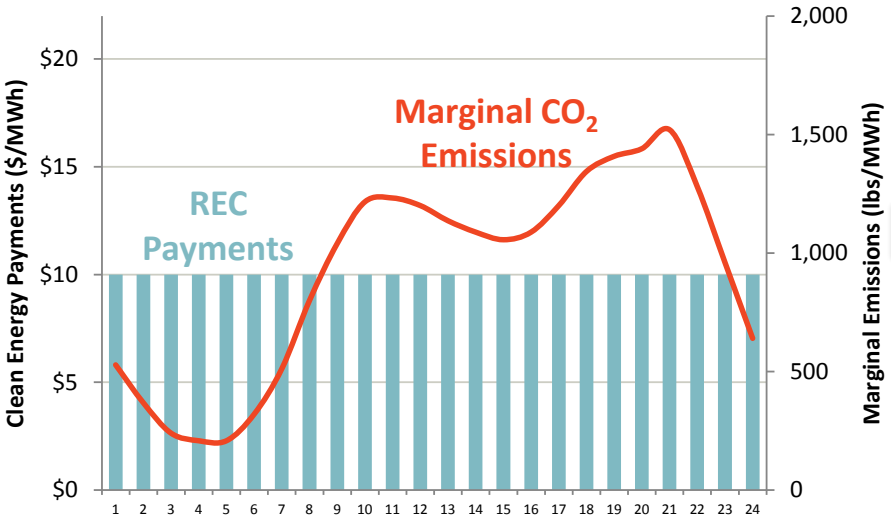
Contents

Design Concept

"Dynamic" Clean Energy Payments

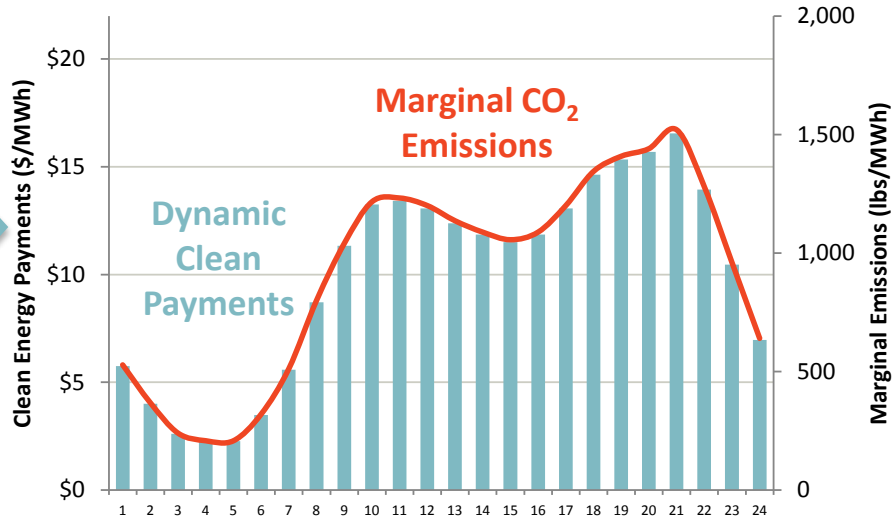
The centerpiece of this design proposal is a new "carbon-linked" dynamic clean energy payment

Illustrative Traditional REC-Payments



- Flat payments over every hour
- Incentive to offer at negative energy prices during excess energy hours

Illustrative "Dynamic" Clean Payments



- Payments scale in proportion to marginal CO_2 emissions
- Incentive to produce clean energy when and where it avoids the most CO_2 emissions
- No incremental incentive to offer at negative prices

Design Concept

Anchor Price and Dynamic Payments

Clean energy suppliers earn payments that scale in proportion to carbon abatement value:

$$\text{Payments} = \frac{\text{Marginal Emissions Rate}}{\text{Reference Emissions Rate}} \times \text{Anchor Price}$$

- **Reference Emissions Rate** is set prior to the forward auction (for example, at the average system-wide marginal emissions rate, such as 1,100 lbs/MWh)
- Clearing price in the forward auction sets an **Anchor Price** based on the Reference Emissions Rate
- **Realized Payments** to individual resources scale dynamically in proportion to realized **Marginal Emissions Rate** calculated by the ISO at the time and place of delivery (mimics CO_2 pricing incentives for clean energy resources)

Design Concept

Incentives for Clean Energy in the Right Locations

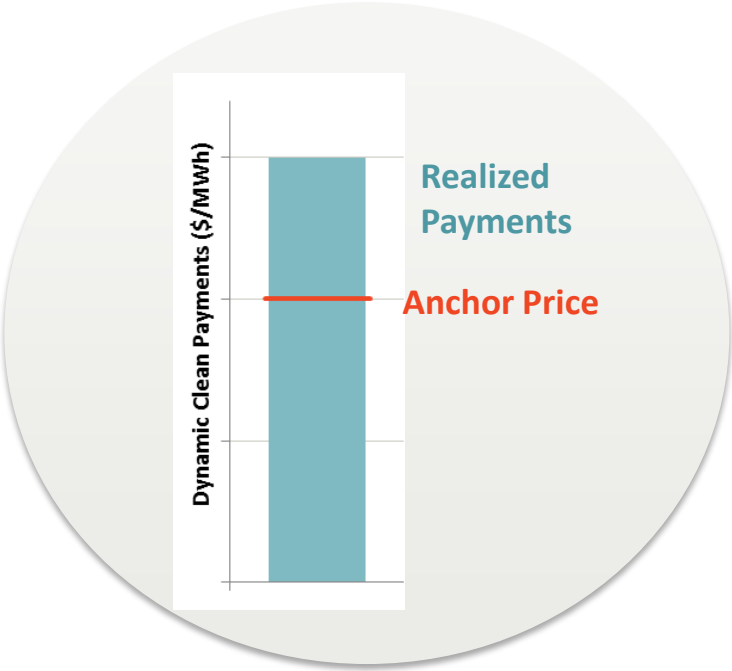
Location-specific payments will focus incentives to develop new clean energy where they will displace the most CO_2 emissions

Low-Emitting Location

Generation pocket that is already saturated with wind. New clean energy will mostly displace the generation of existing wind resources (and will earn fewer payments)

High-Emitting Location

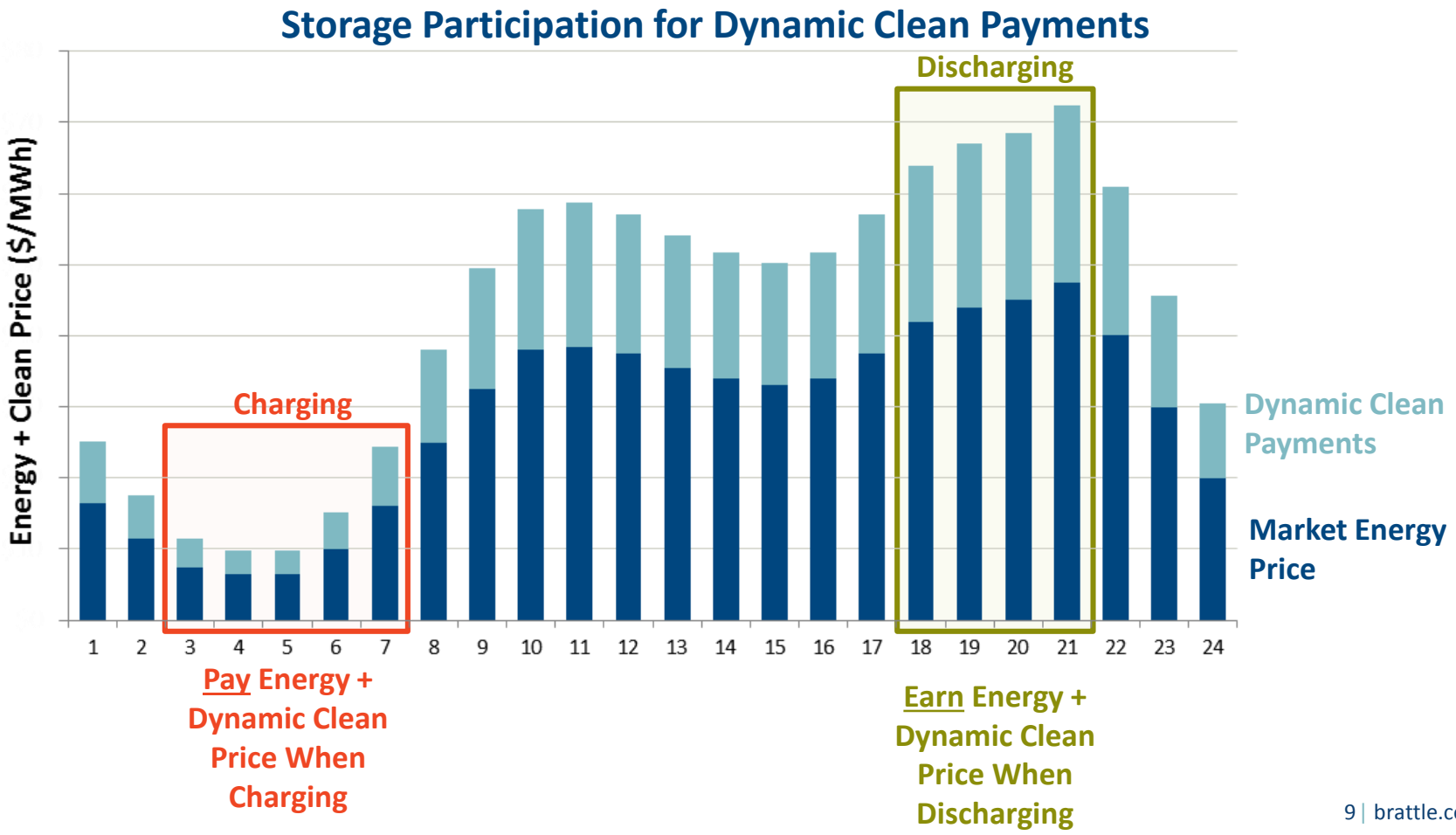
Load pocket where high-emitting steam oil units are often called on. Clean energy will displace more emissions (and earn more payments)



Design Concept

Incentives at the Right Times (Including for Storage)

Dynamic payments incentivize clean energy at the right times to displace the most CO_2 emissions, enabling storage to compete with other technologies



Design Concept

Base and "Targeted" Clean Energy Resources

States submit the demand for clean energy and the maximum willingness to pay. States can choose to purchase:

"Base" Resources

- Procures the least cost clean supply, whether new or existing
- All resources can participate (hydro, wind, solar, nuclear, storage), no restrictions by type or location
- 1-year anchor price lock-in for existing; ~7-12 year lock-in for new
- State commitment to submit demand bids in future years, e.g. for 10 years

"Targeted" Resources

- State carve outs for new resources
- State has option to define a specific type (e.g. for emerging technologies)
- ~7-12 year anchor price lock-in
- No state commitment to submit demand in future years
- Option for a "contingent" bid. If targeted resource prices are too high, the state can choose to purchase lower-cost "base" resources instead

Contents

Design Updates

Incorporating Clean Energy as In-Market

This coalition's proposal aims to accommodate a top priority for states: ensuring clean revenues are considered in-market for the purposes of ISO-NE's minimum offer price rule

- As an initial proposal, we suggest that revenues up to the "Base" resource price be considered in-market. The price increment between the "Base" and "Targeted" resource price would be considered out-of-market for Targeted resources
- ISO-NE's FERC-approved Tariff already considers as in-market any clean energy incentives that are broadly available across the New England Control Area, such as renewable energy credits and production tax credits

ISO-NE Tariff: *Revenues will be considered out-of-market that "are: (a) not tradable throughout the New England Control Area or that are restricted to resources within a particular state or other geographic sub-region; or (b) not available to all resources of the same physical type within the New England Control Area, regardless of the resource owner."*

Tariff Section III (Market Rule 1), Appendix A.21.2 (b)(i)

Design Updates

Ensuring the Market is Financeable

This design intentionally places most fundamentals-based and asset-specific risks on sellers that are in the best position to manage the risks. However, we propose two key design features to mitigate regulatory risks and support financeability :

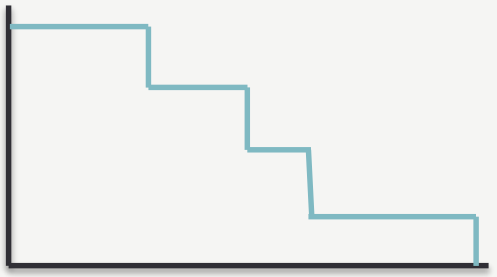
- **Commitment Period:** New resources will earn a price lock-in for clean energy payments for ~7-12 years (particular term is subject to adjustment)
- **Minimum Payout Guarantee:** At least 80% of revenues determined at auction will be paid out to the market *on average*, even if system marginal emissions rate falls

Allocate Risks to Customers	Allocate Risks to Sellers	
Regulatory Risks	**Market Fundamentals**	**Asset-Specific Risks**
• Unanticipated changes to state policy • Unpredictable changes to state demand bids • Rule changes	• Resource mix • Load growth • Fuel prices • Transmission development • Energy, capacity, and ancillary service prices	• Construction delays • Unanticipated asset costs • Asset performance

Design Updates

How Would States Oversee Demand Bids?

States would maintain <u>complete control</u> over demand bids, with each state potentially choosing a different responsible entity and approval process. Here are two possible approaches:

Example	Description	Curve
Clean Net CONE and Target Quantity	• State establishes tariff-like document approving curve shape, cap, and slope that reflect state priorities • State agency estimates "Clean Net CONE" and target quantity using approved method	
Price and Quantity Bids as Complement to Utility Planning	• Utility resource plan recommends quantity and price pairs to procure at auction • Subject to state approval using approaches similar to EE and DR program approvals	

Contents

Modeling Approach

We conducted a preliminary modeling exercise to help quantify the potential benefits of a competitive clean energy market in New England (see detailed appendix)

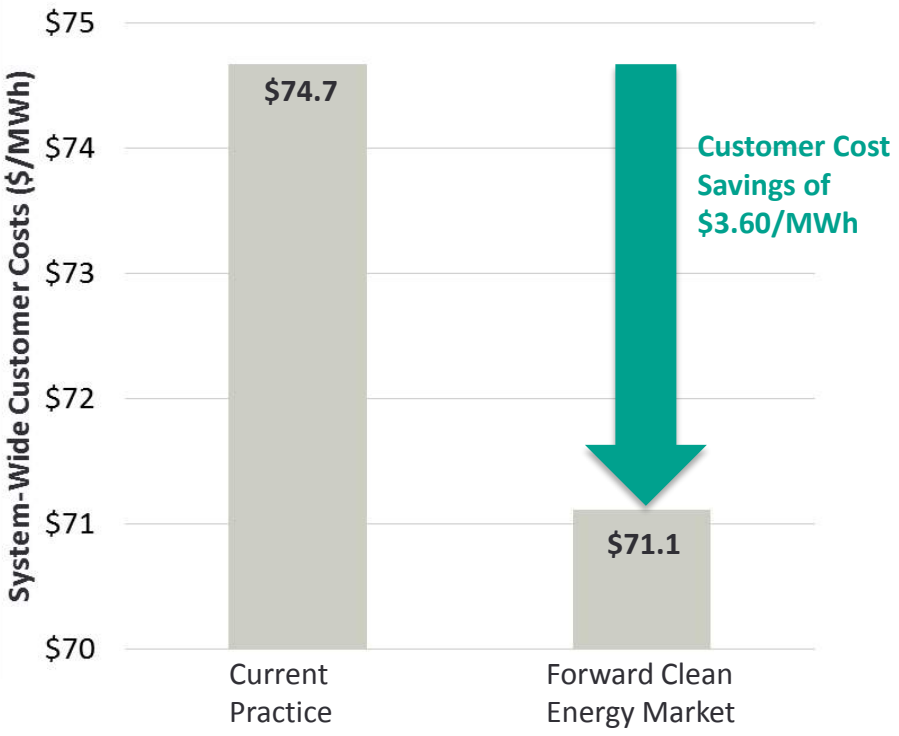
- **Scenarios:** Evaluated eight alternative approaches for achieving states' carbon reductions targets of 80% by 2050. Summary results here focus on:
  - *Current Practice* relying on technology-specific procurement of new resources
  - *Two-Tier New and Existing FCEM* for procuring clean resources using the market-based mechanism proposed by the coalition
- **Approach:** Used Brattle's CO_2 SIM modeling platform, and adopted primary input assumptions from the state-vetted Phase I NESCOE/LEI study
- **Preliminary Findings:** Intended to inform states about the customer, societal, and emissions impacts of alternative market, and non-market approaches to achieving carbon goals

Modeling

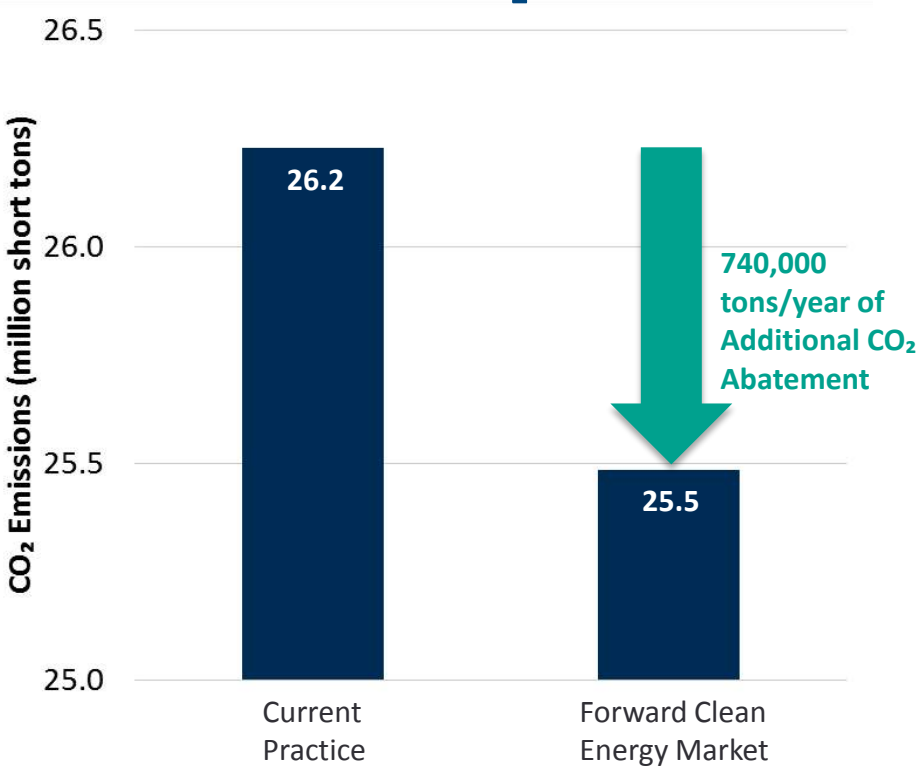
Customer Cost Savings and Emissions Reductions

Preliminary simulation shows clean energy market saves customers $450 million ($3.60/MWh) and reduces CO_2 emissions by 740,000 tons per year relative to Current Practice

Customer Cost Savings



Additional CO_2 Abatement

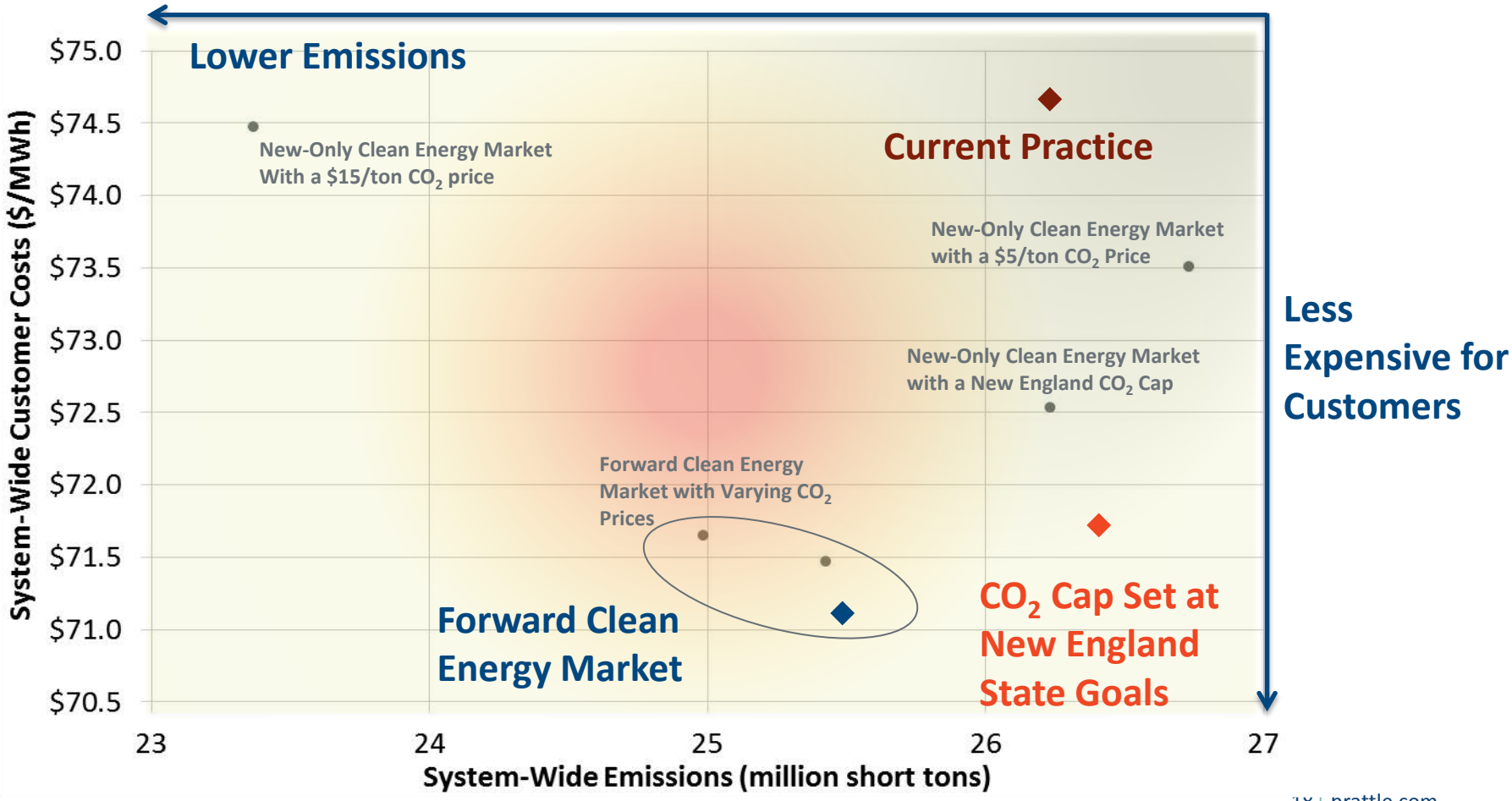


Note: Simple average of nominal costs and emissions from 2020-2029.

Modeling

Customer Cost Savings and Emissions Reductions

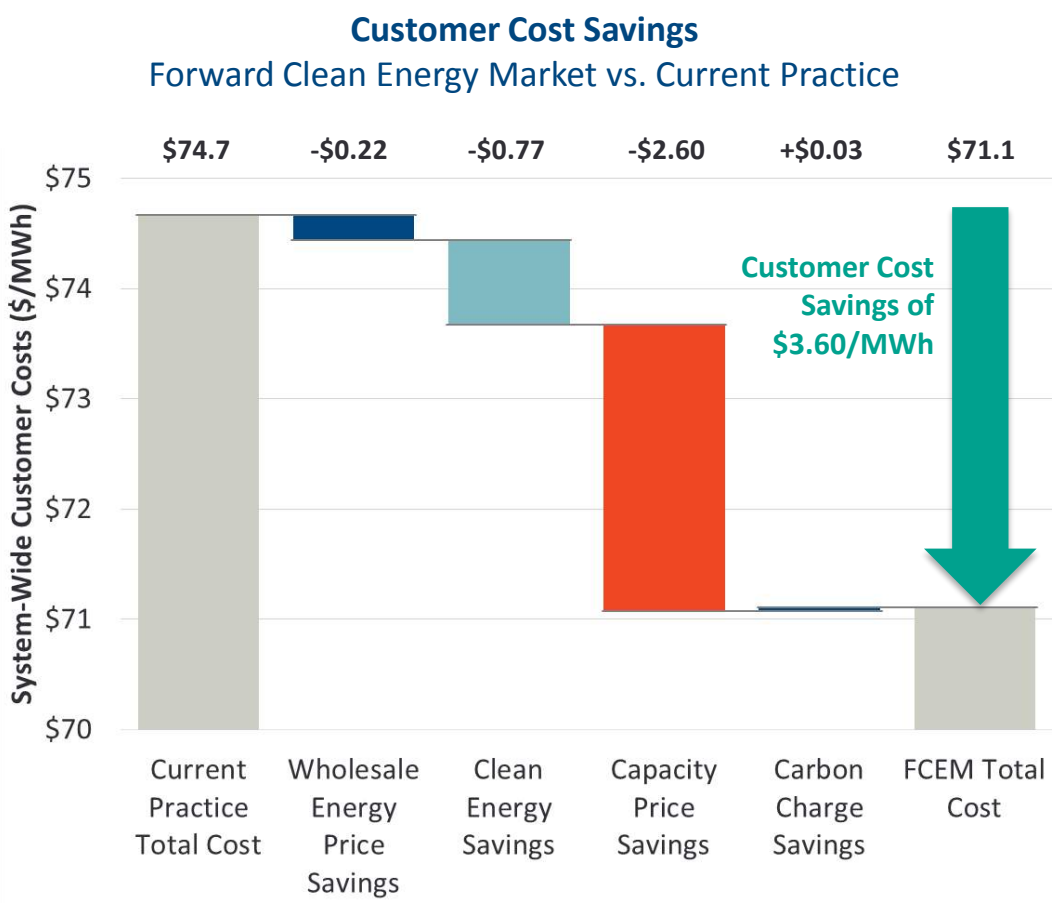
New and existing clean energy market achieves reductions while keeping customer costs lower than with other alternatives



Note: Simple average of nominal costs and emissions from 2020-2029.

Modeling

How The Market Achieves Customer Benefits



Modeled benefits:

- Clean and conventional investment cost savings
- Operating cost savings
- Customer cost savings
- Reductions in CO_2 emissions

Savings come from broad competition:

- Between new and existing generators
- Across resource types
- Across locations within New England

Modeling

Customer Benefits Detail

Customers save under the coalition's proposal through lower energy payments, lower capacity payments, and lower clean energy procurement costs (see Appendix)

		Modeled Scenarios			Delta Above (Below) Current	
		Current Practice	Regional Cap on CO_2	Two-Tier New and Existing FCEM	Regional Cap on CO_2	Two-Tier New and Existing FCEM
Customer Cost Components						
Energy	*($/MWh)*	$46.4	$50.5	$46.2	$4.1	($0.2)
Capacity	*($/MWh)*	$23.7	$24.4	$23.0	$0.7	($0.8)
Clean Energy	*($/MWh)*	$5.8	n/a	$3.2	($5.8)	($2.6)
CO_2 Revenue Rebate	*($/MWh)*	($1.2)	($3.2)	($1.2)	($2.0)	$0.0
Total Customer Costs	*($/MWh)*	$74.7	$71.7	$71.1	($3.0)	($3.6)
Per Year Total	*($million/year)*	$9,373	$9,002	$8,926	($371)	($447)
Clean Energy Produced	*(TWh)*	68.4	67.5	70.1	(0.9)	1.7
Total CO_2 Emissions	*(million tons)*	26.2	26.4	25.5	0.2	(0.7)

Modeling

Benefits Not Captured in Initial Modeling

A competitive clean energy market will offer other additional benefits that we have not estimated in our modeling:

- Efficiencies attributable to **Dynamic Payments** to clean resources that encourage generation *where* and *when* it can displace most carbon
- Benefits of dispatching and attracting **storage** to displace carbon emissions
- Improved liquidity and transparency
- Benefits of a more open, competitive process such as attracting **new entrants**, **innovative solutions**, and **unanticipated emerging technologies**
- Benefits to informing more **cost-effective transmission development** for achieving policy goals
- Cost savings due to **clean resources being considered in-market** for FCM

Contents

Next Steps

Further Developing the Design

- Working with states to establish a working group to further develop the design
- Planning a technical conference with stakeholders in 2018

Design Open Questions

- Ensuring robustness and longevity of demand for clean energy
- Transmission upgrade cost representation in offers or market clearing
- Determining auction parameters (price cap and reference emissions rate)
- Interactions with RECs and clean energy contracts (existing and future)
- Incentivizing performance (delivery obligations, reconfiguration auctions, qualification standards and quantities)

Biography and Contact Information

KATHLEEN SPEES

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Dr. Kathleen Spees is a Principal at The Brattle Group with expertise in designing and analyzing wholesale electric markets and carbon policies. Dr. Spees has worked with market operators, transmission system operators, and regulators in more than a dozen jurisdictions globally to improve their market designs for capacity investments, scarcity and surplus event pricing, ancillary services, wind integration, and market seams. She has worked with U.S. and international regulators to design and evaluate policy alternatives for achieving resource adequacy, storage integration, carbon reduction, and other policy goals. For private clients, Dr. Spees provides strategic guidance, expert testimony, and analytical support in the context of regulatory proceedings, business decisions, investment due diligence, and litigation. Her work spans matters of carbon policy, environmental regulations, demand response, virtual trading, transmission rights, ancillary services, plant retirements, merchant transmission, renewables integration, hedging, and storage.

Kathleen earned a B.S. in Mechanical Engineering and Physics from Iowa State University. She earned an M.S. in Electrical and Computer Engineering and a Ph.D. in Engineering and Public Policy from Carnegie Mellon University.

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Ms. Judy Chang is an energy economist and policy expert with a background in electrical engineering and 20 years of experience in advising energy companies and project developers with regulatory and financial issues. Ms. Chang has submitted expert testimonies to the U.S. Federal Energy Regulatory Commission, U.S. state and Canadian provincial regulatory authorities on topics related to transmission access, power market designs and associated contract issues. She also has authored numerous reports and articles detailing the economic issues associated with system planning, including comparing the costs and benefits of transmission. In addition, she assists clients in comprehensive organizational strategic planning, asset valuation, finance, and regulatory policies.

Ms. Chang has presented at a variety of industry conferences and has advised international and multilateral agencies on the valuation of renewable energy investments. She holds a BSc. In Electrical Engineering from University of California, Davis, and Masters in Public Policy from Harvard Kennedy School, is a member of the Board of Directors of The Brattle Group, and the founding Director of New England Women in Energy and the Environment.

About The Brattle Group

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governmental agencies worldwide.

We combine in-depth industry experience and rigorous analyses to help clients answer complex economic and financial questions in litigation and regulation, develop strategies for changing markets, and make critical business decisions.

Our services to the electric power industry include:

- Climate Change Policy and Planning
- Cost of Capital
- Demand Forecasting Methodology
- Demand Response and Energy Efficiency
- Electricity Market Modeling
- Energy Asset Valuation
- Energy Contract Litigation
- Environmental Compliance
- Fuel and Power Procurement
- Incentive Regulation
- Rate Design and Cost Allocation
- Regulatory Strategy and Litigation Support
- Renewables
- Resource Planning
- Retail Access and Restructuring
- Risk Management
- Market-Based Rates
- Market Design and Competitive Analysis
- Mergers and Acquisitions
- Transmission

Offices

BOSTON

NEW YORK

SAN FRANCISCO

WASHINGTON, DC

TORONTO

LONDON

MADRID

ROME

SYDNEY

Appendix

Design Proposal Detail

Design

Components of the Dynamic Clean Energy Market

	Design Element
Dynamic Clean Energy Market	**Product Definition:** • Clean attribute only (not bundled with energy) • Anchor price determined in the forward auction, but realized payments scaled in proportion to marginal CO_2 emissions rate at the time and place of delivery (replicates the incentives from a CO_2 price)
	Supply and Demand: • "Base" product that includes all qualified clean resources (new and existing) • Base demand quantity should not decrease over time to provide regulatory certainty (perhaps for 10 years) • States have the option to specify "targeted" products (new resources or specific types of new resources) • Base and targeted new resources earn a price lock-in over ~7-12 years • States or their designated entities determine the quantity and price of demand bids • States can submit "contingent" demand bids for targeted resources. If the state's bid for a newer higher-cost targeted resources does not clear, then the MWh of demand can revert to buying the cheapest "base" clean energy that is available
	Procurement Auction: • Forward clean energy auction conducted immediately prior to the FCM • Transmission development costs can be incorporated into offers or auction clearing
Carbon Pricing	• This coalition continues to recommend enhanced CO_2 pricing as a means to efficiently contribute to achieving decarbonization goals, although it is not the subject of this proposal • The dynamic clean energy market will work well in concert with enhanced CO_2 pricing, but can also be pursued on a stand-alone basis

Design

Base and "Targeted" Clean Energy Resources

	Base Resources	Targeted Resources
Qualified Resources	• All non-emitting resources • New and existing • Storage is qualified (must pay the clean price when charging, earns clean price when discharging)	• New resources • States can determine a specific technology type if desired
Price Lock-in	• 1 year for existing resources • ~7-12 years for new resources	• Targeted resources have a longer lock-in period (e.g. ~7-12 years) for cleared resources
Demand Bid Longevity	• Demand would increase, not decrease, over ~10 years • Limits placed on the size of demand reductions in future years	• Demand may exist for only 1 year and does not need to be resubmitted the following year (but any cleared resources have a price lock-in for ~7-12 years)
Entity Submitting Demand Bids	• State or designated entity (e.g. utility)	• State or designated entity (e.g. utility)
Price and Quantity	• Price-quantity pairs or sloped curve defined by state • ISO-NE to work with each state to determine what input parameters and analytical support is desired each year (e.g. estimate of clean Net CONE or needed quantities)	• Price-quantity pairs or sloped curve defined by state • ISO-NE to work with each state to determine what input parameters and analytical support is desired each year (e.g. estimate of targeted resource Net CONE)
"Contingent" Demand Bids	• n/a	• States have the option to designate bids as "contingent" • Contingent demand bids will procure "targeted" new clean resources as long as the targeted resources are available at or below the bid price. If not enough targeted supply clears, then the uncleared quantity will be procured from the lower-price "base" product • If reverting to demand for the "base" product, the price lock-in period will revert to 1 year and the demand bid can revert to a lower price

Design

Forward Clean Energy Auction

Supply Offers

- Sellers offer in $/MWh
- Offer prices consider sellers' expectations of other revenue streams: capacity, ancillary, and energy (including CO_2 price)
- All sellers qualify as "Base", a subset of new resources can qualify as "Targeted"

Auction Clearing

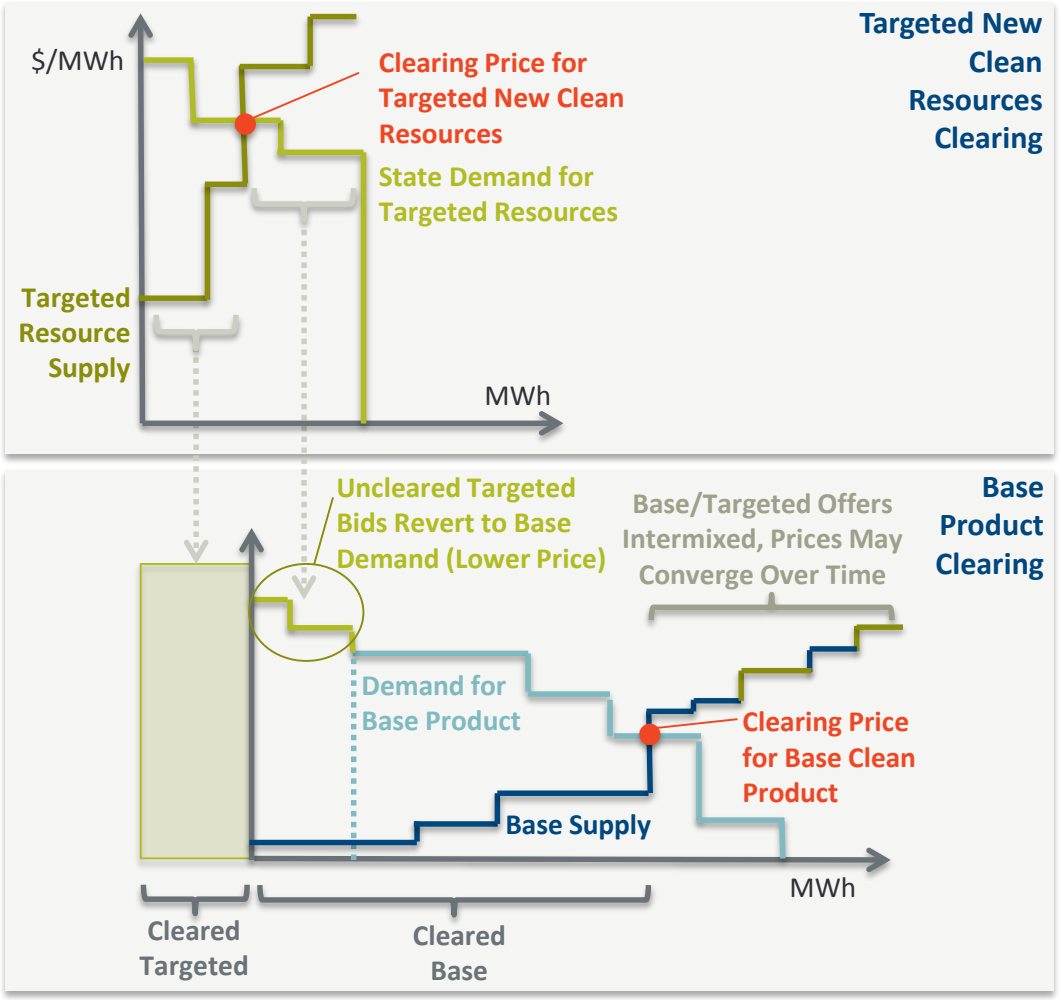
- Co-optimized clearing for all states' demand
- Conducted immediately prior to the FCM
- Uncleared clean resources have the option for a separate capacity-only offer in FCM

Cost Allocation & Supply Accounting

- States pay for their own cleared demand
- Emissions accounting: States can only take credit for clean energy procured in this auction or outside PPA (no state can claim the clean value of uncleared existing supply)

Example: Auction Clearing

Assume: Only One Targeted Category, with All "Contingent" Bids



Design

Pros and Cons of Dynamic Clean Product

Advantages	
Incentives for Clean Resources that Displace the Most CO_2 Emissions	• Clean payments scale in proportion to marginal CO_2 abatement
No Negative Offer Prices	• Unlike many types of clean energy incentives and PPAs, there are no incentives for clean energy to offer negative into the energy market
Economic Efficiency	• Incentives similar to the efficient outcomes from a CO_2 price (at least for covered resources)
Suppliers Bear Most Fundamentals-Based Investment Risk	• Locational energy price risk, fleet mix, technology change, fuel price, and load growth risks mostly borne by suppliers
Customers Take on Most Regulatory Risks	• Risk of policy certainty mostly borne by customers (via price and demand bid lock-ins and minimum payout guarantee) • Over- and under-performance risk also borne by customers
Storage Can Participate	• Storage has opportunities to participate if charge/discharge cycle displaces CO_2 emissions

Disadvantages	
Complexity	• Less intuitive and more complex than historical approaches or CO_2 pricing alone • New product and market pose implementation costs and risks
Lack of Competition between Targeted and Base Resources	• Higher-cost targeted new resources might get built while lower-cost base resource opportunities are forgone/retire • The more targeted categories are introduced, the less competition (and higher societal costs) could be incurred
Losing Some Efficiencies Compared to Enhanced CO_2 Pricing	• May forgo lower-cost CO_2 avoidance options for non-covered resources (e.g. energy efficiency, some types of DR) • No incentives for fossil plants to avoid CO_2 emissions

Design

Example: Dynamic Clean Energy Payments

Concept: Simulate operational and investment incentives for clean energy that mimics the incentives from a CO_2 price

- Clean energy payment is additive to energy payments (not a bundled product)
- Product definition assumes a pre-defined Reference Emissions Rate (e.g. 1,100 lbs/MWh), based on the average marginal emissions rate in the last delivery year (across all delivered clean MWh)
- Realized payments scale dynamically in proportion to marginal emissions displacement at the time and place of delivery (i.e. proportional to the CO_2 component of LMP)
- Sellers displacing more CO_2 earn proportionally higher payments per MWh for the clean product (and in the energy market with CO_2 price), sellers displacing less CO_2 earn less
- Clean energy buyers take on the risk of over- and under-performance in aggregate

Example: Clean Energy Incentives

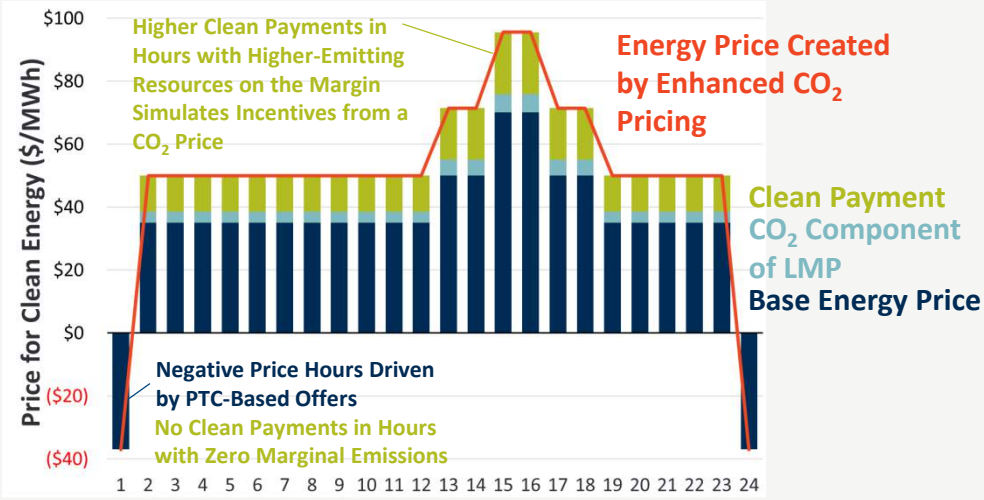
Market and Product Parameters

Reference Emissions Rate	1,100 *(lbs/MWh)*
CO_2 Price in Energy Market	$7 *($/ton)*
Clean Energy Anchor Price	$13 *($/MWh)*
Simple Average Energy Price	$38 *($/MWh)*

Realized Revenue

		Wind	Solar
Base Energy Payments	*($/MWh)*	$24	$49
CO_2 Component of LMP	*($/MWh)*	$3	$4
Clean Energy Payments	*($/MWh)*	$10	$14
Total	***($/MWh)***	**$37**	**$67**
Avoided Emissions Rate	***(lbs/MWh)***	**869**	**1,231**

Marginal Incentives in a Typical Day



Appendix

Detailed Modeling Assumptions and Results

Modeling

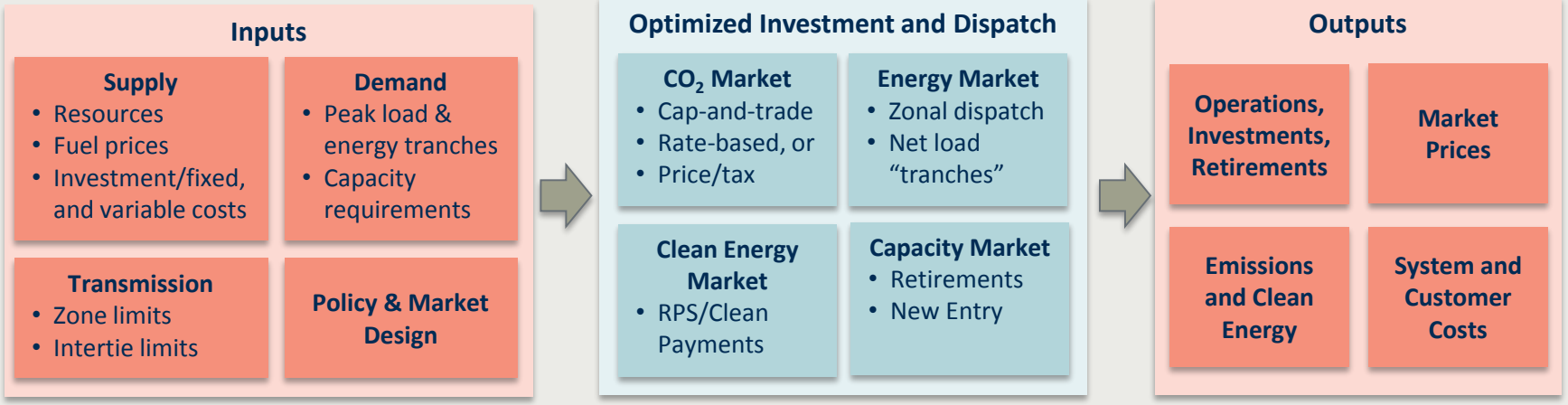
Modeling Framework

- We use an expansion modeling tool CO_2 SIM that models electricity markets and CO_2 policies
- Can be used to evaluate investments, retirements, emissions, customer costs, and system costs under different market designs and CO_2/clean energy policies

Assumptions and Simplifications

- Study of 2016-2050 (focus on results 2020-2030)
- Seasonal periods, with 50 load and clean energy supply tranches each year
- Imports, exports, and hydro modeled as fixed profiles
- No storage modeling
- One weather year for all load and clean energy profiles
- Capacity requirements at vertical demand curve (no sloping curve), no representation of Performance Incentives (PI)

- CO_2 Scenario Impact Model (CO_2 SIM)



Modeling

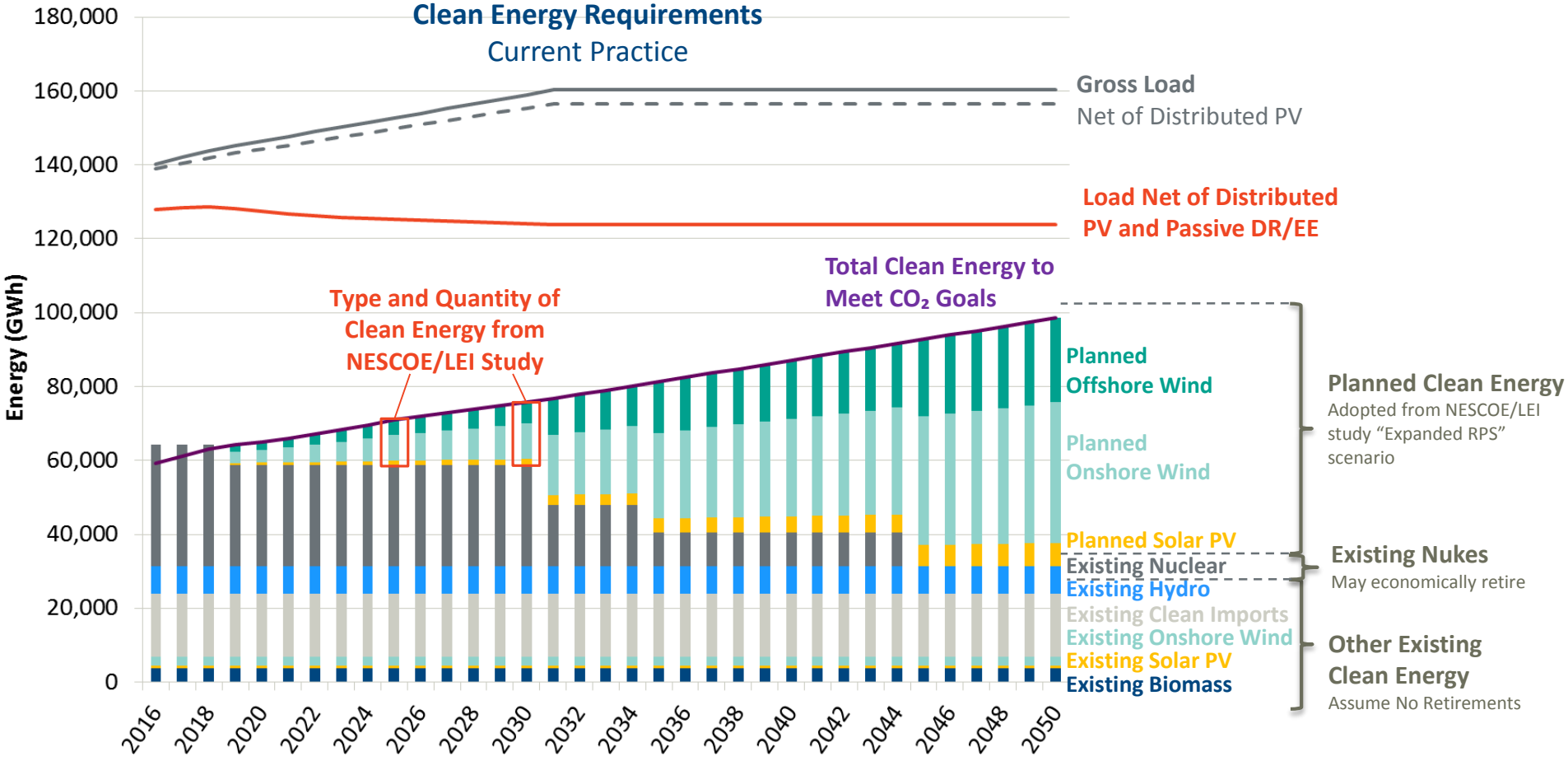
Design Alternatives for Meeting CO_2 Targets

Design Concept	Clean Energy Market	CO_2 Pricing
1. Current Practice	• Intended to reflect current clean energy procurement practices • Pre-defined quantity of clean resources • Pre-defined technology types	$5/ton RGGI CO_2 market price (assumption from NESCOE/LEI study)
2. CO_2 Cap	• None	CO_2 cap imposed on New England, consistent with aggregate target across states
3. New-Only Clean Energy Market	• Market for new clean energy • Eligible to earn payments for first 10 years after online date • Existing resources awarded no payments	Sub-cases with three different CO_2 prices: 3a. $5/ton RGGI Price 3b. $15/ton CO_2 Price (Enhanced RGGI) 3c. CO_2 Cap to Meet Targets
4. Two-Tier New/Existing Clean Energy Market	• Two-tier market awarding different payment levels to new and existing clean energy resources • New resources earn higher payments for the first 10 years • Existing resources earn lower payments for helping to meet total clean energy goals • **Most similar to this coalition's FCEM proposal, except that clean energy payments are indifferent to time and place (no dynamic profiling)**	Sub-cases with three different CO_2 prices: 3a. $5/ton RGGI Price 3b. $15/ton CO_2 Price (Enhanced RGGI) 3c. CO_2 Cap to Meet Targets

Modeling

1. Current Practice: Clean Energy Targets

Approach is to procure a pre-defined quantity of a specific resource type



Sources and Notes:

Existing clean energy reflects 2016 ISO-NE generation, planned clean energy based on LEI/NESCOE study's Expanded RPS Scenario extrapolated to meet state CO_2 targets.

Current Practice clean energy targets are resource-specific, based on LEII study (extrapolated to 2050) and consistent with tri-state RFP, MA 83D (offshore wind), and MA 83C (9.5 TWh/year, assumed to be non-imported RPS-eligible)

Requirements assume specific nuke retire dates, but economics can driver earlier (or later) retirement dates

Modeling

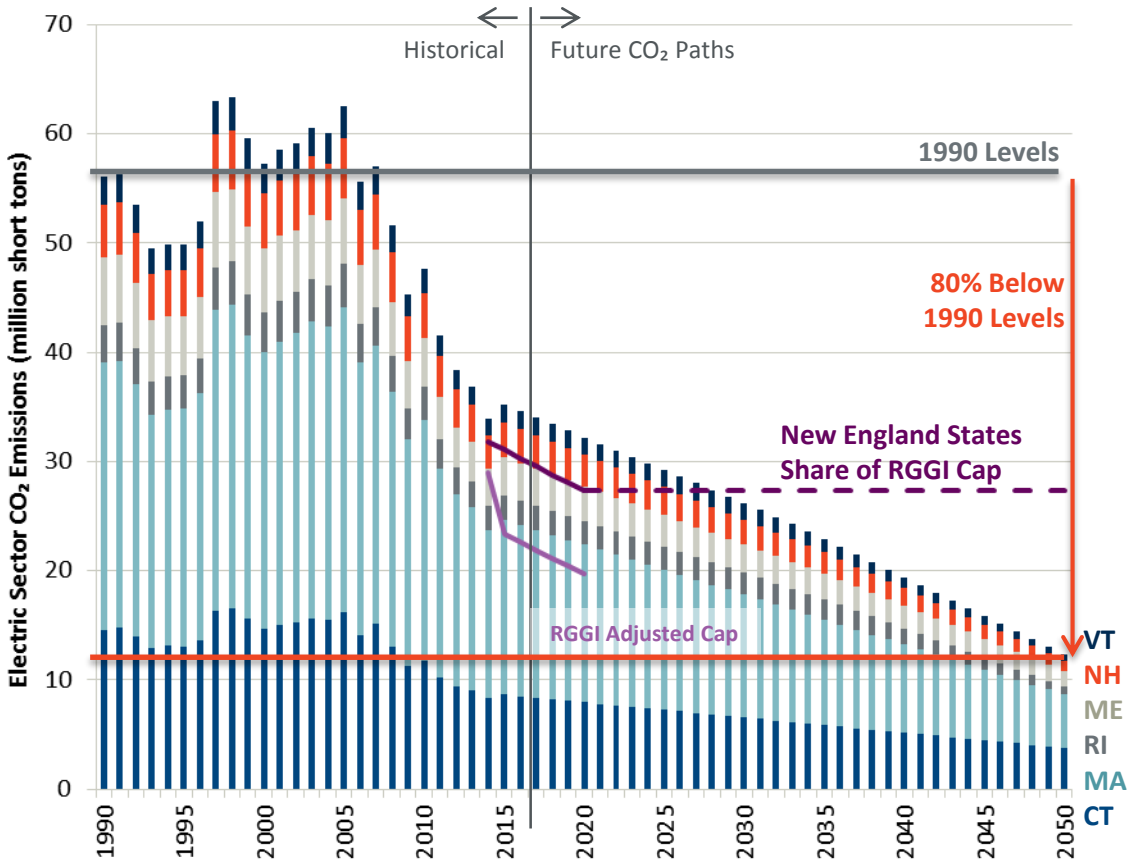
2. CO_2 Cap: System-Wide Reduction Target

- For the CO_2 cap scenario we adopt a system-wide electricity sector reduction target consistent with state goals
- In other scenarios, this same target is translated into a clean energy goal

New England Economy-Wide CO_2 Emissions Reduction Goals

State	Mandate?	GHG Targets
VT	Non-mandated	40% below 1990 levels by 2030, 80-95% below by 2050.
NH	Non-mandated	20% below 1990 levels by 2025, 80% below by 2050.
ME	Non-mandated	10% below 1990 levels by 2020, 75-80% below 2003 levels by 2050.
RI	Non-mandated	10% below 1990 levels by 2025, 45% below by 2035, and 80% below by 2050.
MA	Mandated	10-25% below 1990 levels by 2020, interim targets for 2030 and 2040 (TBD), and 80% below by 2050.
CT	Mandated	10% below 1990 levels by 2020, 75-85% below 2001 levels by 2050.

Historical Electric Sector CO_2 Emissions and Future Targets

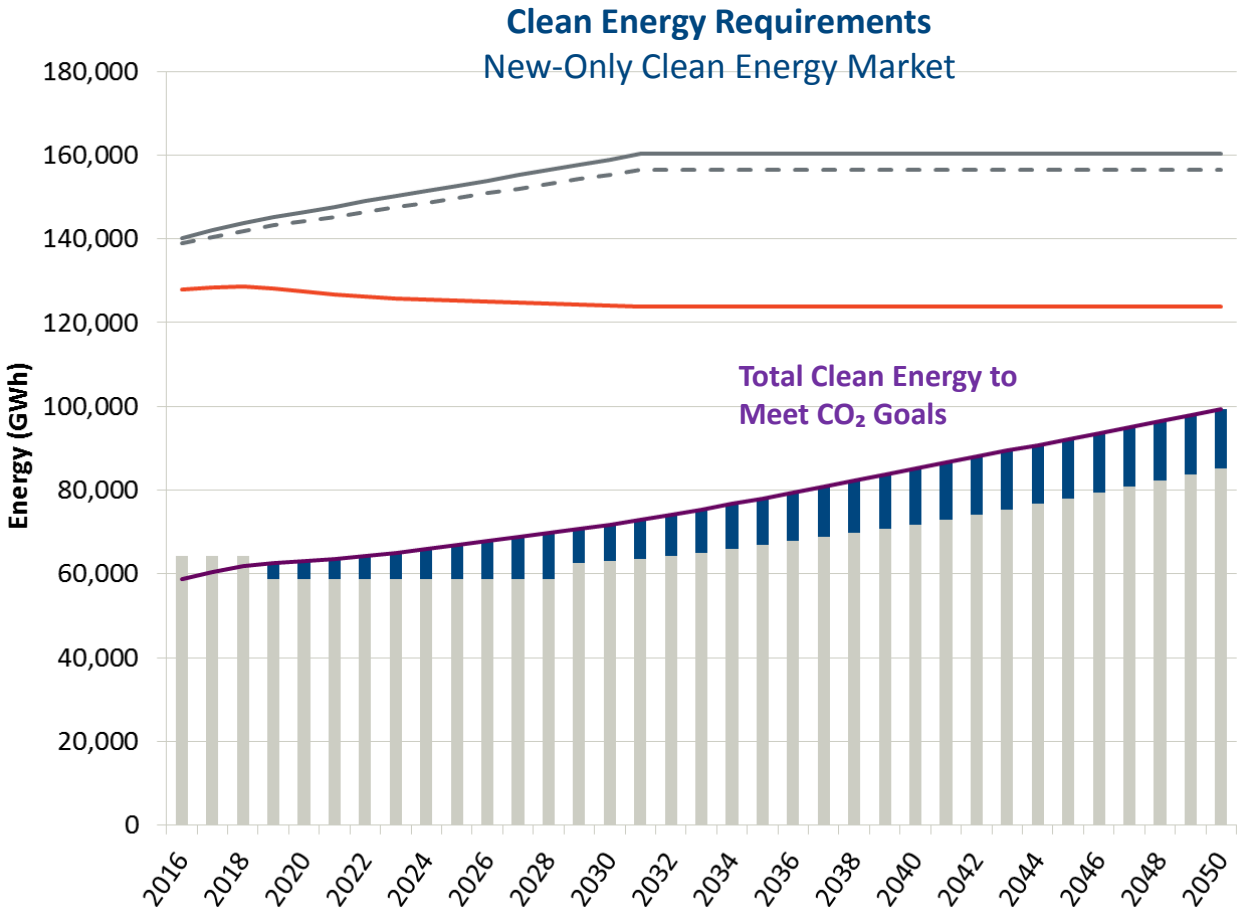


Sources: EIA, U.S. Electric Power Industry Estimated Emissions by State (EIA-767, EIA-906, EIA-920, and EIA-923). https://www.eia.gov/electricity/data/state/
ISO-NE, http://isonewswire.com/updates/2017/3/1/the-new-england-states-have-an-ongoing-framework-for-reducin.html

Modeling

3. New-Only: Clean Energy Targets

Approach is to procure a specific quantity of new clean resources (technology-neutral). New resources earn New Clean Energy payments for the first 10 years.



Gross Load
Net of Distributed PV

Load Net of Distributed PV and Passive DR/EE

New Clean Energy Requirement
- Remain New for the First 10 Years After Online Date
- Earn clean energy payments of New Clean Energy price (plus energy and capacity)

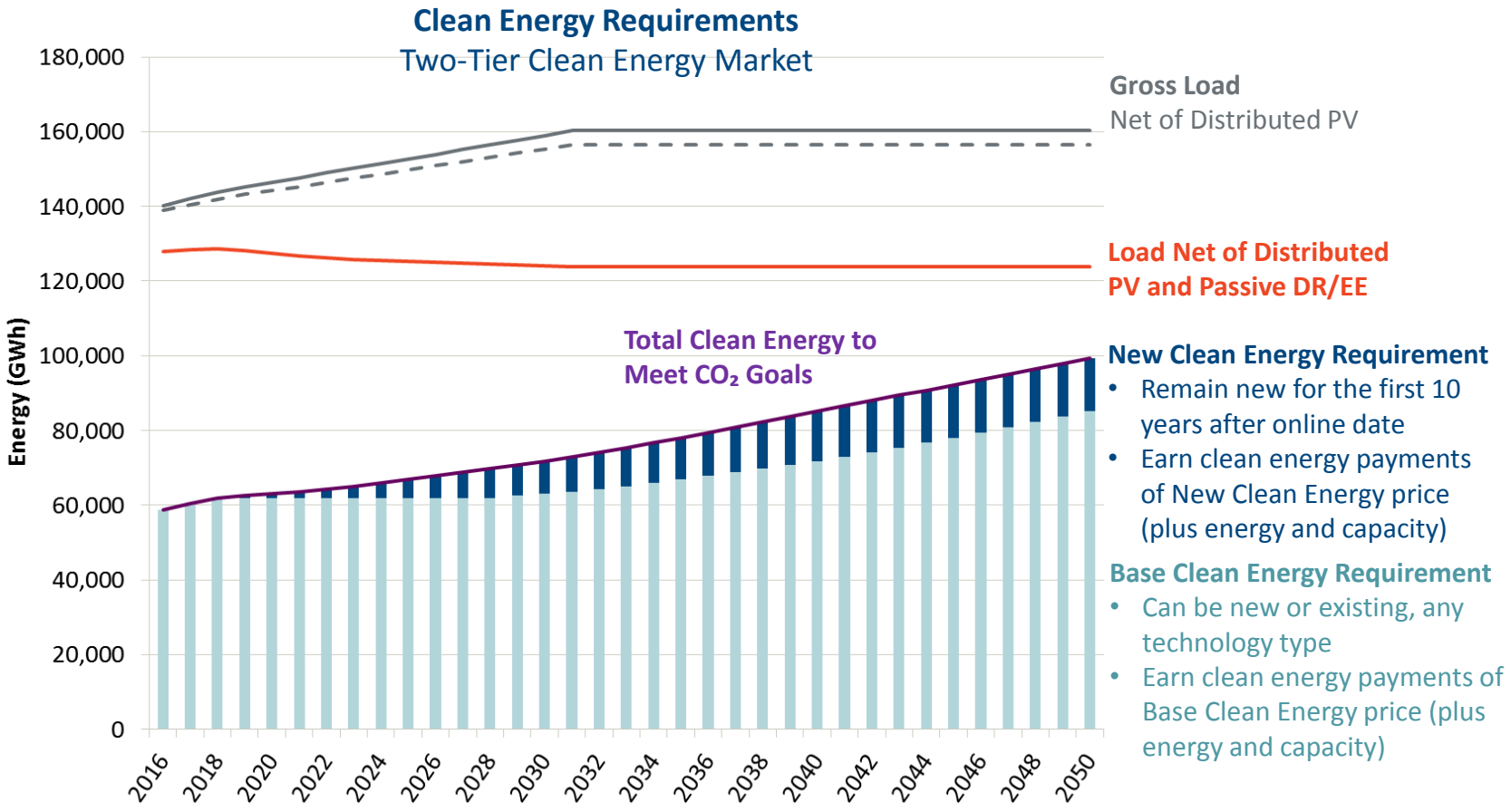
Existing Clean Energy Assumption
- Do not earn any clean energy payments (but do earn energy and capacity revenues)
- Not a modeled constraint. Design may achieve more or less than this projected quantity

Sources and Notes:
Existing clean energy reflects 2016 ISO-NE generation, planned clean energy based on LEI/NESCOE study's Expanded RPS Scenario extrapolated to meet state CO_2 targets.
Total clean energy needed to meet carbon goals is the same as Current Practice (purple line), but imposed on a resource-neutral basis
Ineligible existing clean energy resources do not earn any clean energy payments, may retire based on economics

Modeling

4. Two-Tier Market: Clean Energy Targets

Two-tier market with new resources earning higher payments for the first 10 years. Existing resources help meet the total clean energy need, but earn a lower price.



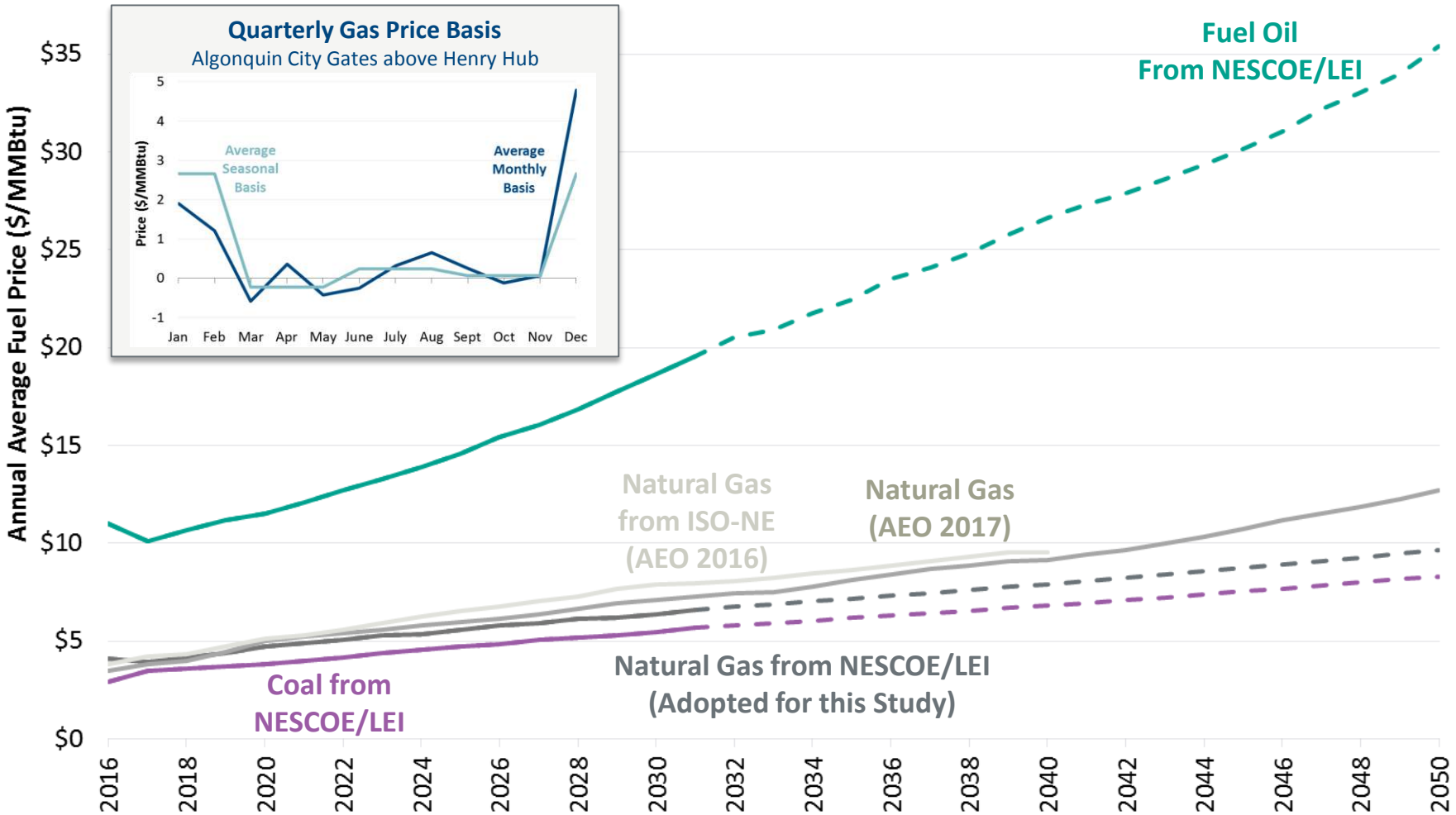
Sources and Notes:

Existing clean energy reflects 2016 ISO-NE generation, planned clean energy based on LEI/NESCOE study's Expanded RPS Scenario extrapolated to meet state CO_2 targets.

All clean resources paid the Base price, so fewer expected retirements mean that the new clean energy requirement can be lower than in New-Only Scenario.

Modeling

Fuel Prices



Source and Notes: Fuel oil, natural gas, and coal prices until 2030 adapted from NESCOE/London Economics International's *Renewable and Clean Energy Scenario Analysis and Mechanisms 2.0 Study.* After 2030, prices are grown at inflation for coal and natural gas and at the EIA 2017 Annual Energy Outlook (AEO) forecast growth rate for fuel oil. Natural gas prices as forecasted in the 2016 and 2017 AEO are also shown for comparison.

Modeling

Existing Plant Going-Forward Costs

- Known retirements consistent with FCM results and owner announcements
- Existing fossil steam plants can retire economically based on going-forward costs
- Nuclear plants can retire economically (forced retirement at 60 years). Significant uncertainty exists in these costs and consequently in potential retirement risks and dates

Existing Nuclear

		Seabrook	Millstone 2	Millstone 3	Pilgrim
Capacity	*(ICAP MW)*	1,329	941	1,394	684
Capacity Factor	*(%)*	90%	90%	90%	90%
Age	*(years)*	26	41	31	44
Forced Retirement	*(year)*	2051	2036	2046	2019
Fuel Costs	*(2017$/MWh)*	$8.57	$8.57	$8.57	$8.57
FOM and CapEx by Plant Age					
30	*(2017$/MWh)*	$22	$22	$22	$22
40	*(2017$/MWh)*	$25	$25	$25	$25
50+	*(2017$/MWh)*	$35	$35	$35	$35

Source and Notes: Cost are based analysis of NEI's April 2017 Nuclear Costs in Context. We assume nuclear plants (with the exception of Pilgrim) retire after 60 years in service, or earlier if going-forward costs exceed market revenues.

Existing Fossil Plants

FOM + Capex

Plant Age		Gas/Oil ST	Coal ST
30	*(2017$/ICAP kW-yr)*	$23	$53
40	*(2017$/ICAP kW-yr)*	$39	$67
50	*(2017$/ICAP kW-yr)*	$65	$85
60	*(2017$/ICAP kW-yr)*	$109	$109

Source and Notes: Costs at age 30 are from EPA IPM assumptions, increase with plant age.

Modeling

New Resource Investment Costs & Assumptions

- Model determines least-cost combination of new entry to meet clean energy, capacity, and energy needs
- Consider new entry from Gas CCs/CTs, onshore wind, offshore wind, PV, and demand response
- We use NESCOE/LEI assumptions for renewable costs; we use capacity factors from ISO-NE's 2017 ORTP/CONE study
- Fossil plants costs based on the ORTP and parameters from the 2017 ORTP/CONE study

New Fossil Plants

		CC	CT
Baseload Capacity	*(ICAP MW)*	491	338
Capacity w/ Duct firing	*(ICAP MW)*	533	
Baseload Heat rate	*(Btu/kWh)*	6,381	9,220
Heat rate w/ Duct firing	*(Btu/kWh)*	6,546	
Levelized Gross Cost	*($2017/ICAP kW-yr)*	$149	$109
VOM	*($2017/MWh)*	$3.23	$4.16

Source and Notes: Based on the ORTP values and Plant parameters used in ISO-NE's CONE and ORTP Updates filing in January 2017. Numbers presented are for the SEMA capacity region. Adjustments were made to other zones to reflect the regional costs based on the EIA's November 2016 Capital Cost Estimates for Utility Scale Electricity Generating Plants.

New Renewables

Levelized Costs

	2025 (2017$/kW-yr)	2030 (2017$/kW-yr)
Onshore Wind	$240	$226
Offshore Wind	$616	$552
Solar	$168	$148

Capacity Factors

	Onshore Wind	Offshore Wind	Solar
CT	34%		15%
MA	34%	42%	16%
ME	38%	40%	14%
NH	32%		16%
RI	31%	42%	15%
VT	34%		15%

Source and Notes: Costs from the NESCOE/LEI Report and represent costs in NH for onshore wind and solar and SEMA for offshore wind. Adjustments were made to reflect the regional costs based on the EIA's November 2016 Capital Cost Estimates for Utility Scale Electricity Generating Plants.
Capacity factors are from the ORTP/CONE study, adjusted to the state level using NREL data. We extrapolate prices prior to 2030 using the implied growth rate. The expectation is after 2030, where we reduce the prices from $100/MWh (pre PTC) in 2016 to 2025 levels. After 2030 we keep the costs constant in real terms after 2030.

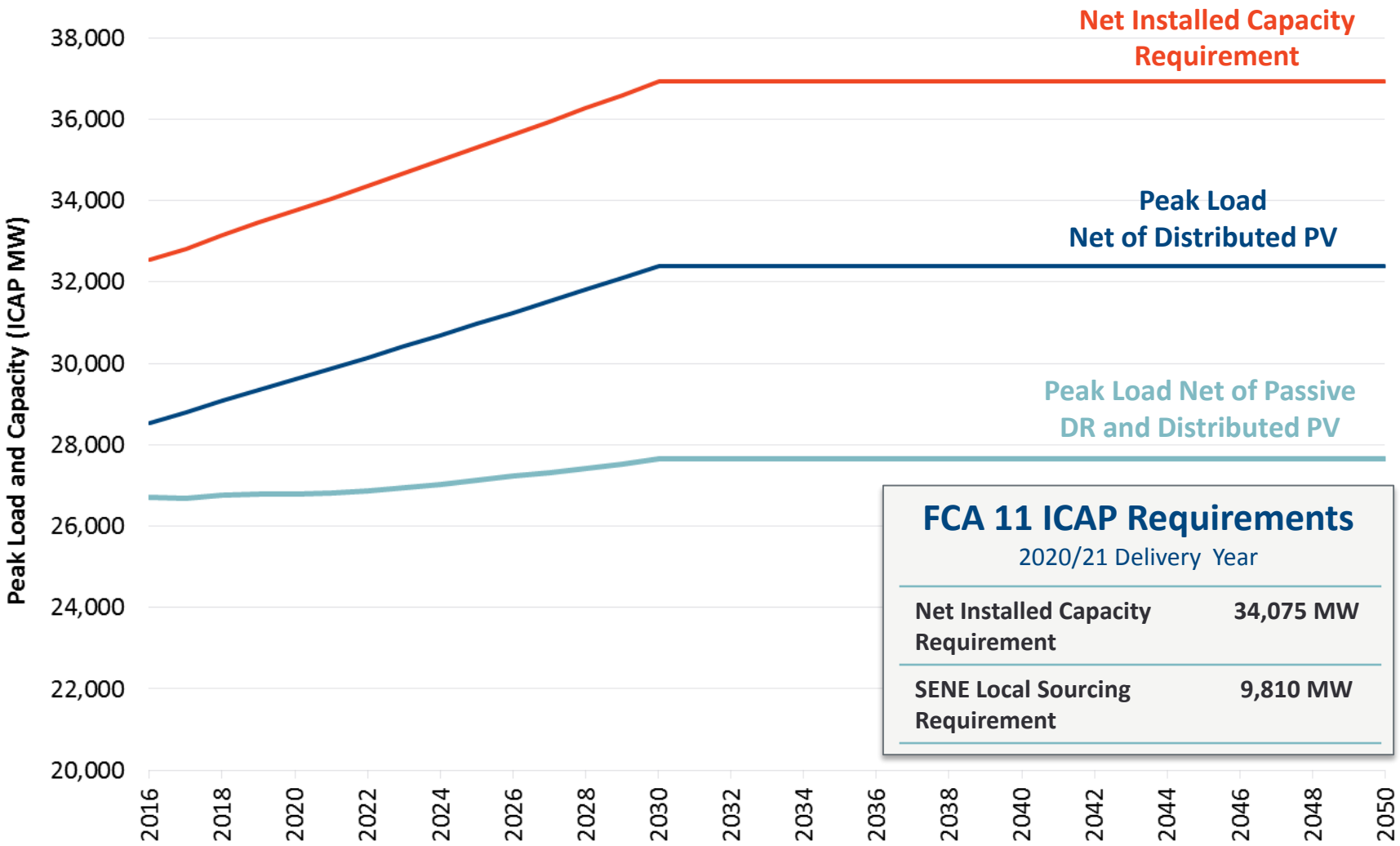
Demand Response

		Inexpensive	Middle	Expensive
Percent of Peak Load	*(%)*	0-12%	12-16%	16-24%
Levelized Gross Cost	*($2017/ICAP kW-yr)*	$37	$92	$135
VOM	*($2017/MWh)*	$1,000	$2,000	$3,000

Source and Notes: Assumptions developed based on FCM results and other studies.

Modeling

Demand



FCA 11 ICAP Requirements

2020/21 Delivery Year

Net Installed Capacity Requirement	34,075 MW
SENE Local Sourcing Requirement	9,810 MW

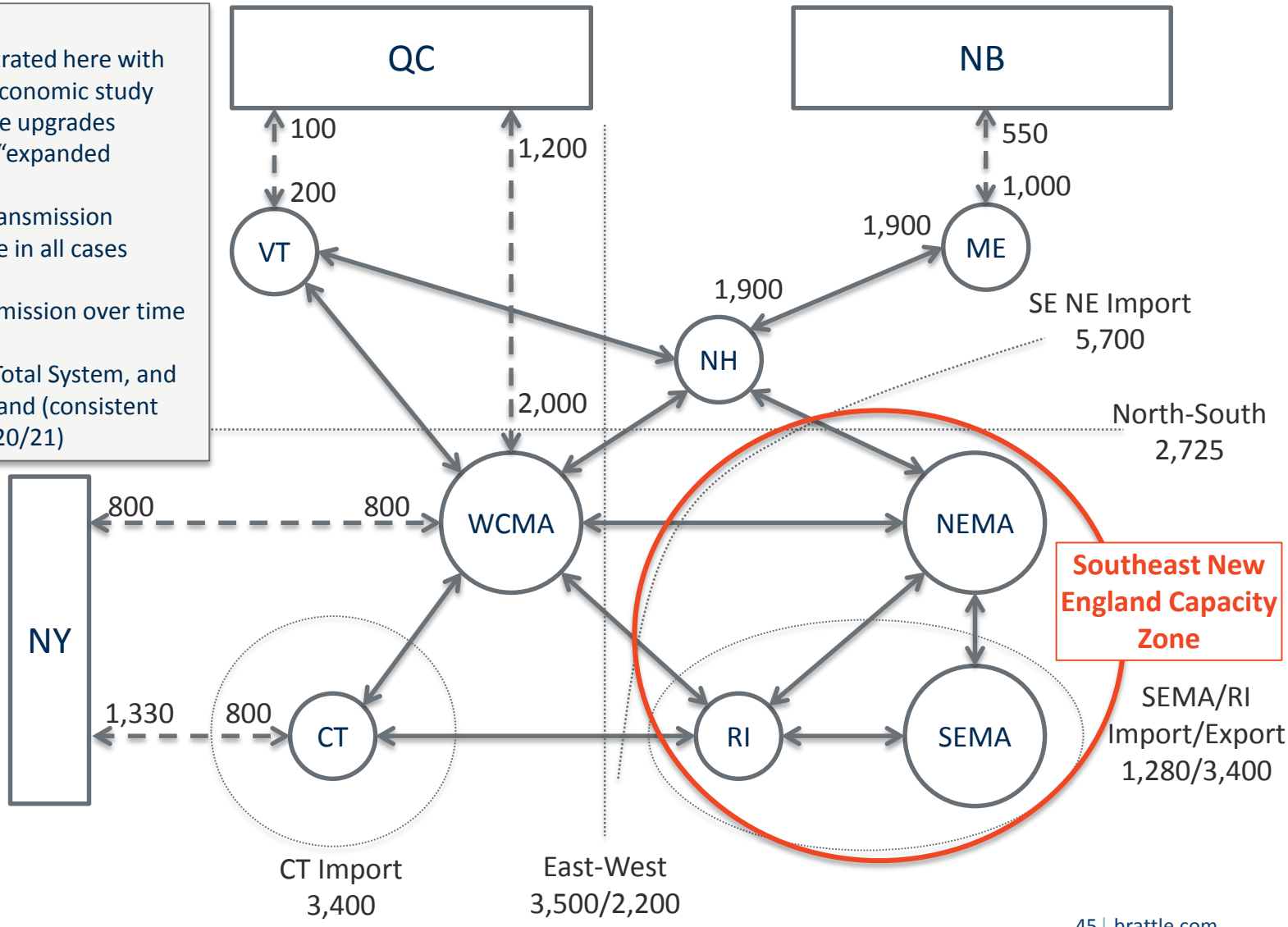
Source and Notes: ISO-NE *2016-2025 Forecast Report of Capacity, Energy, Loads, and Transmission*. FCA requirements grow proportional to system (or local) peak load.

Modeling

Transmission

Energy Market
- Zonal model as illustrated here with limits from ISO-NE economic study
- No additional intertie upgrades (consistent with LEI "expanded renewables" case)
- Add 2,400 MW of transmission upgrades with Maine in all cases (from LEI study)
- No changes to transmission over time

Capacity Market
- Two requirements: Total System, and Southeast New England (consistent with FCA #11 for 2020/21)

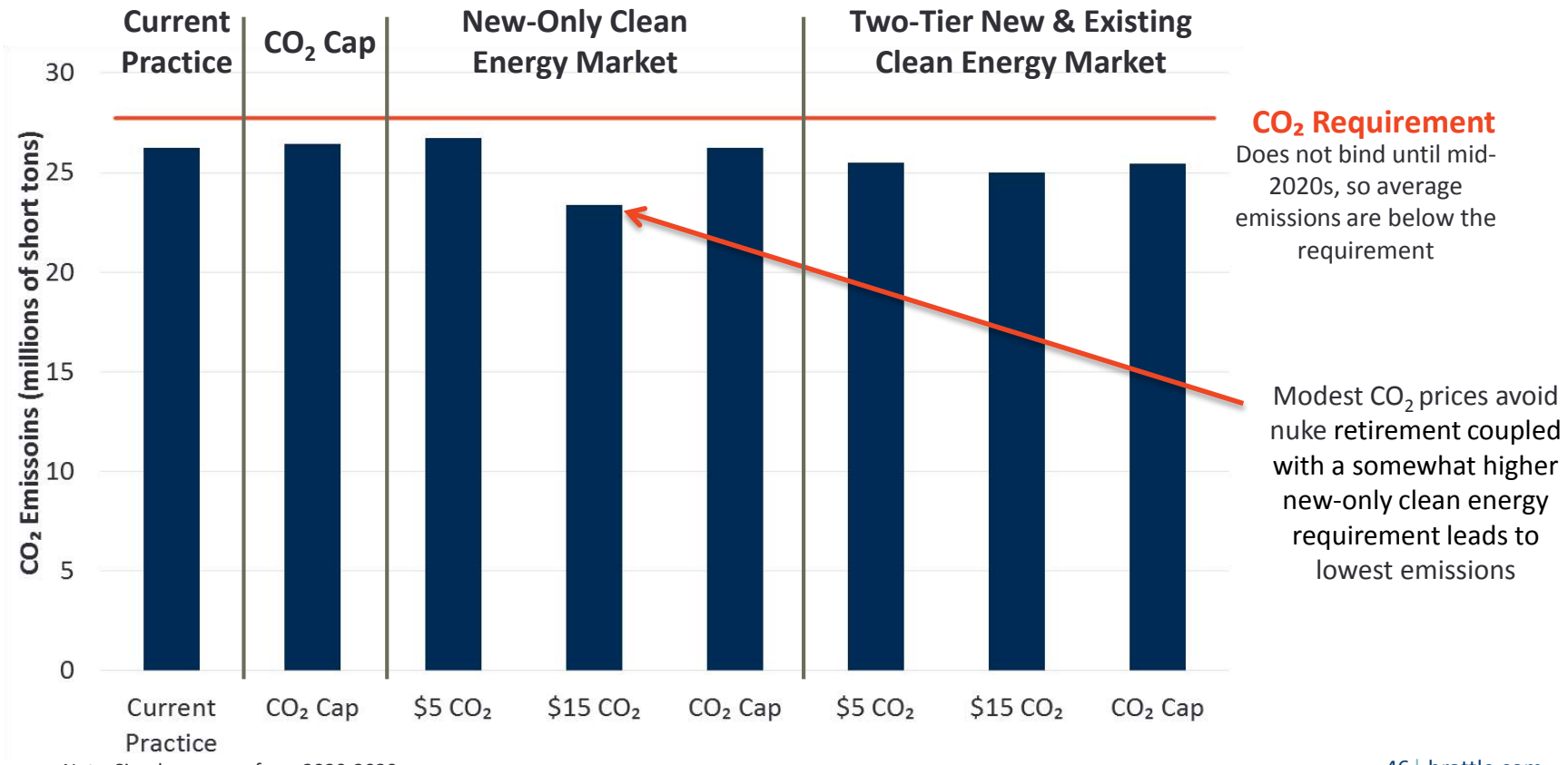


Source: Adapted from 2016 ISO-NE Economic Study

Modeling

Annual Average CO_2 Emissions (2020-2029)

- By design, average annual simulated average CO_2 emissions are similar across scenarios
- However, there are some differences due primarily to the imprecision in translating from the CO_2 target to the MWh of clean energy requirements (e.g. "new-only" cases do not always accurately predict timing of nuclear retirements)



Note: Simple average from 2020-2029.

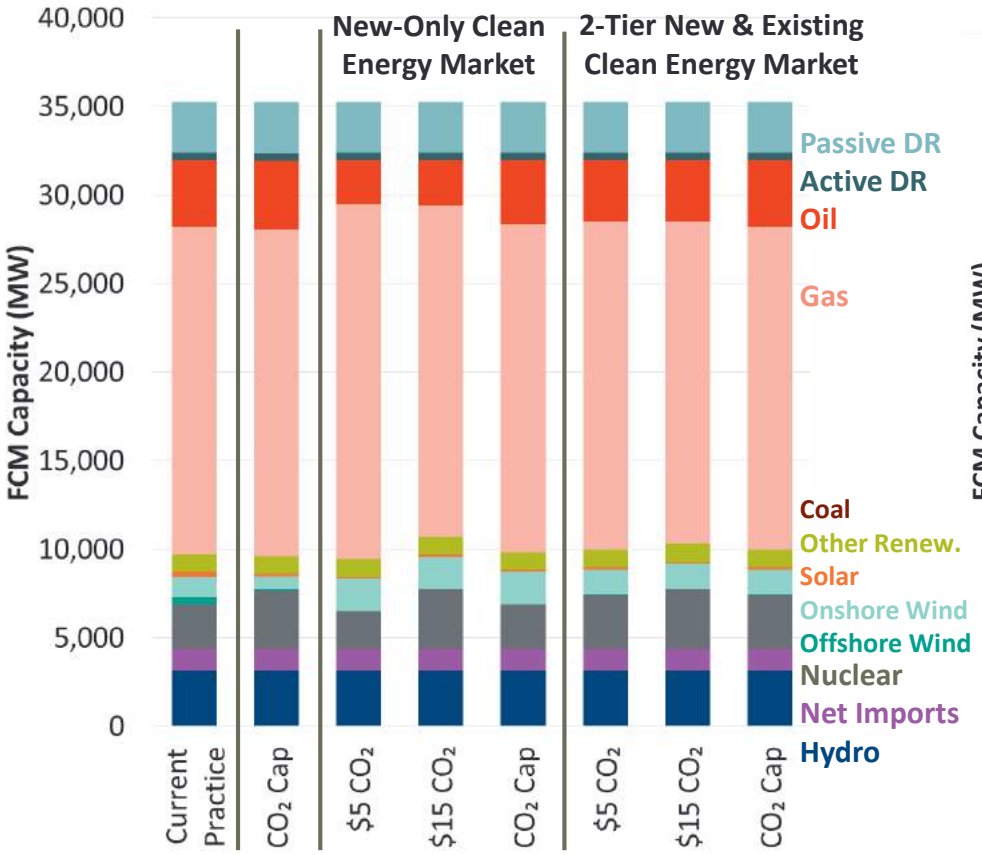
Modeling

Capacity Additions and Retirements

More new clean energy is built in the New-Only and Current Practice cases in order to replace nuclear retirements

2029 Capacity

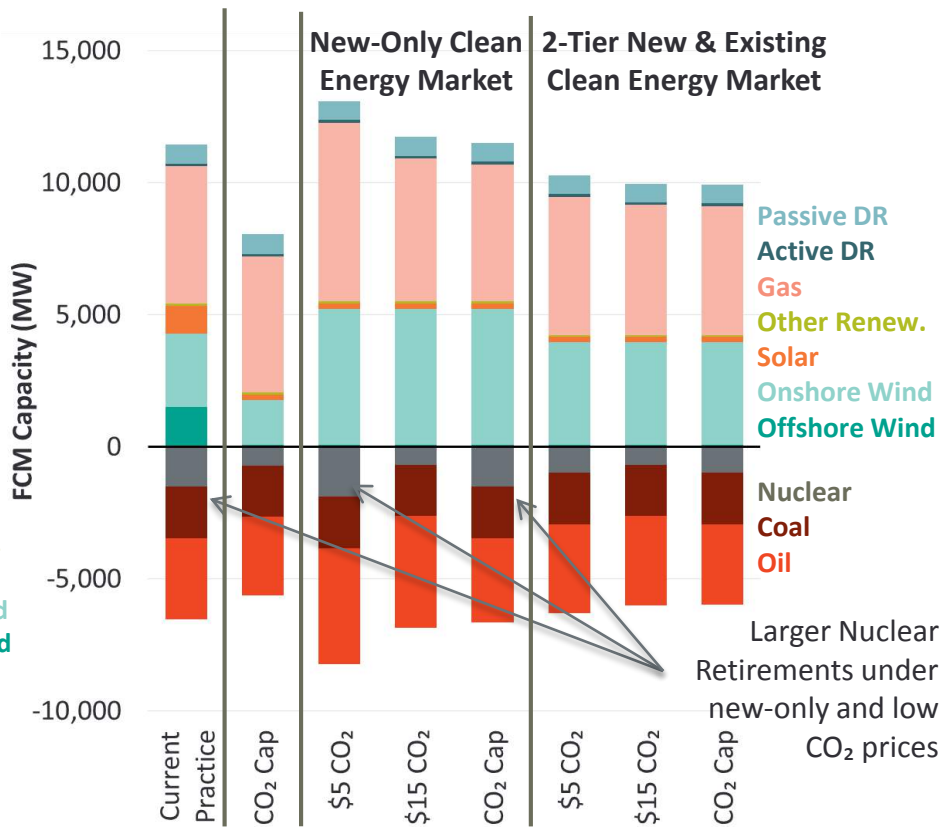
Renewables at Derated FCM Capacity Value



Builds and Retirements (2016-2029)

Includes 3.7 GW of Gas and 1 GW of Wind planned builds

(Renewables at Nameplate Capacity)

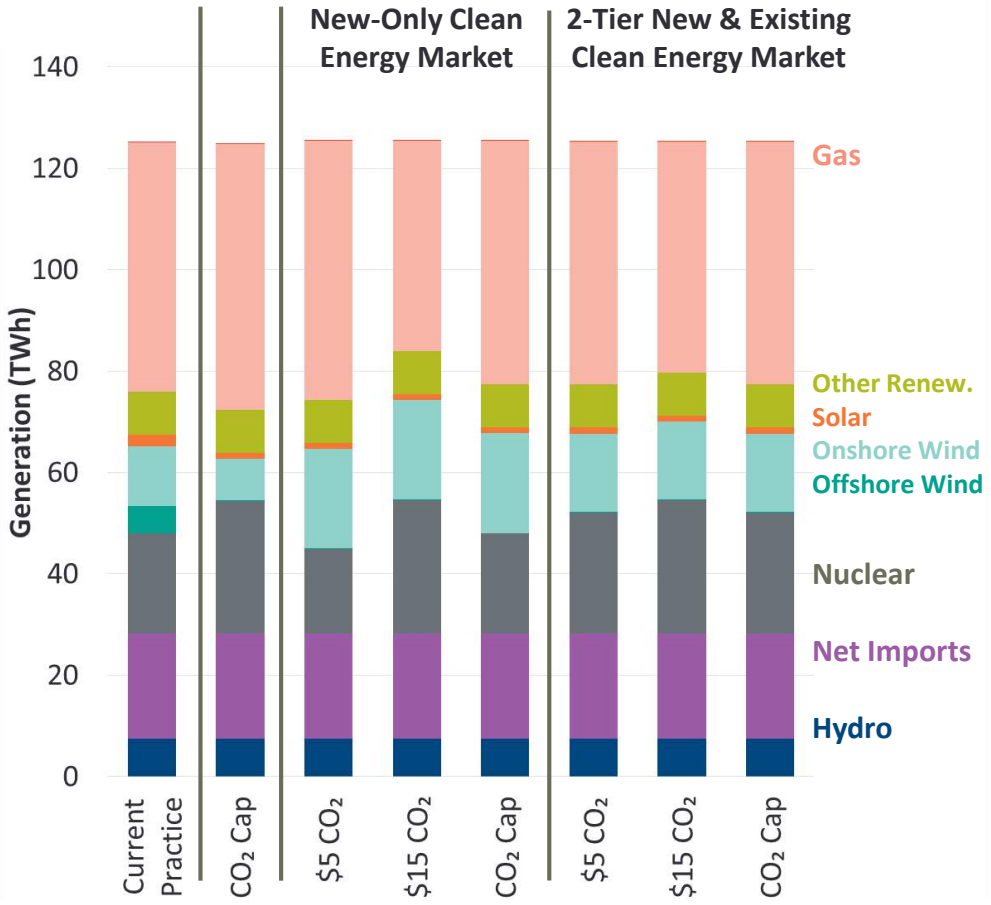


Modeling

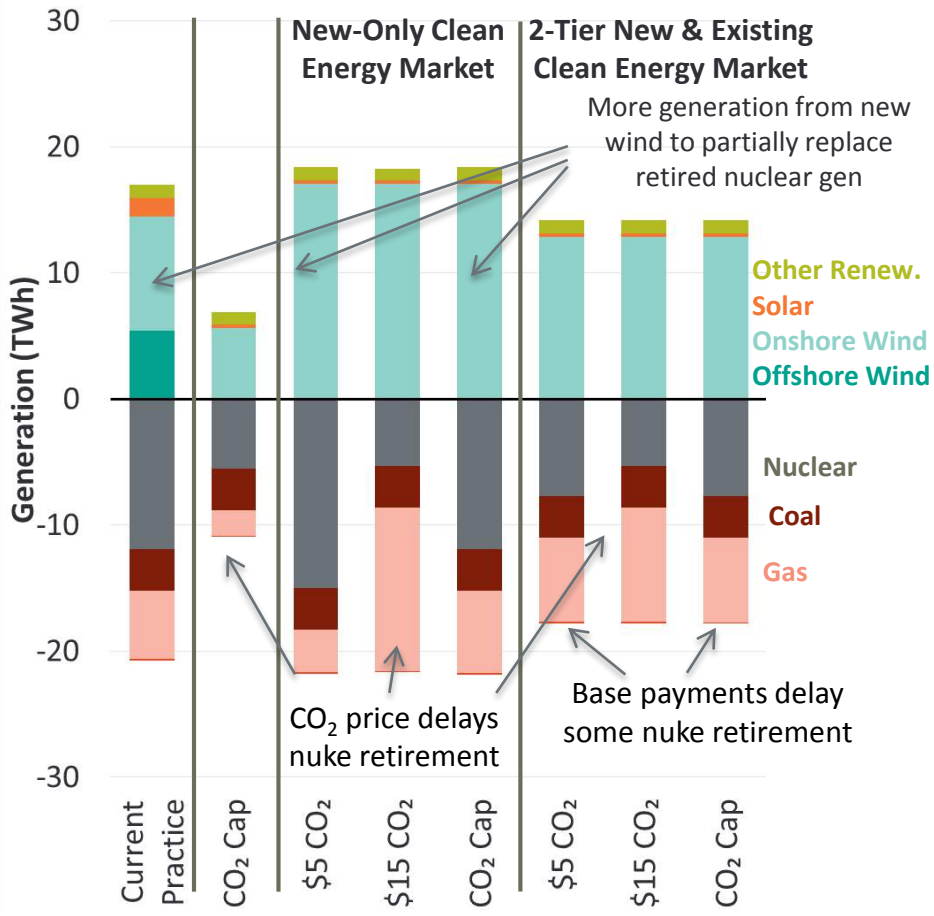
Generation Output

New clean resources primarily displace fossil generation, but must also replace clean generation from retiring nukes in the Current Practice and New-Only cases

2029 Generation



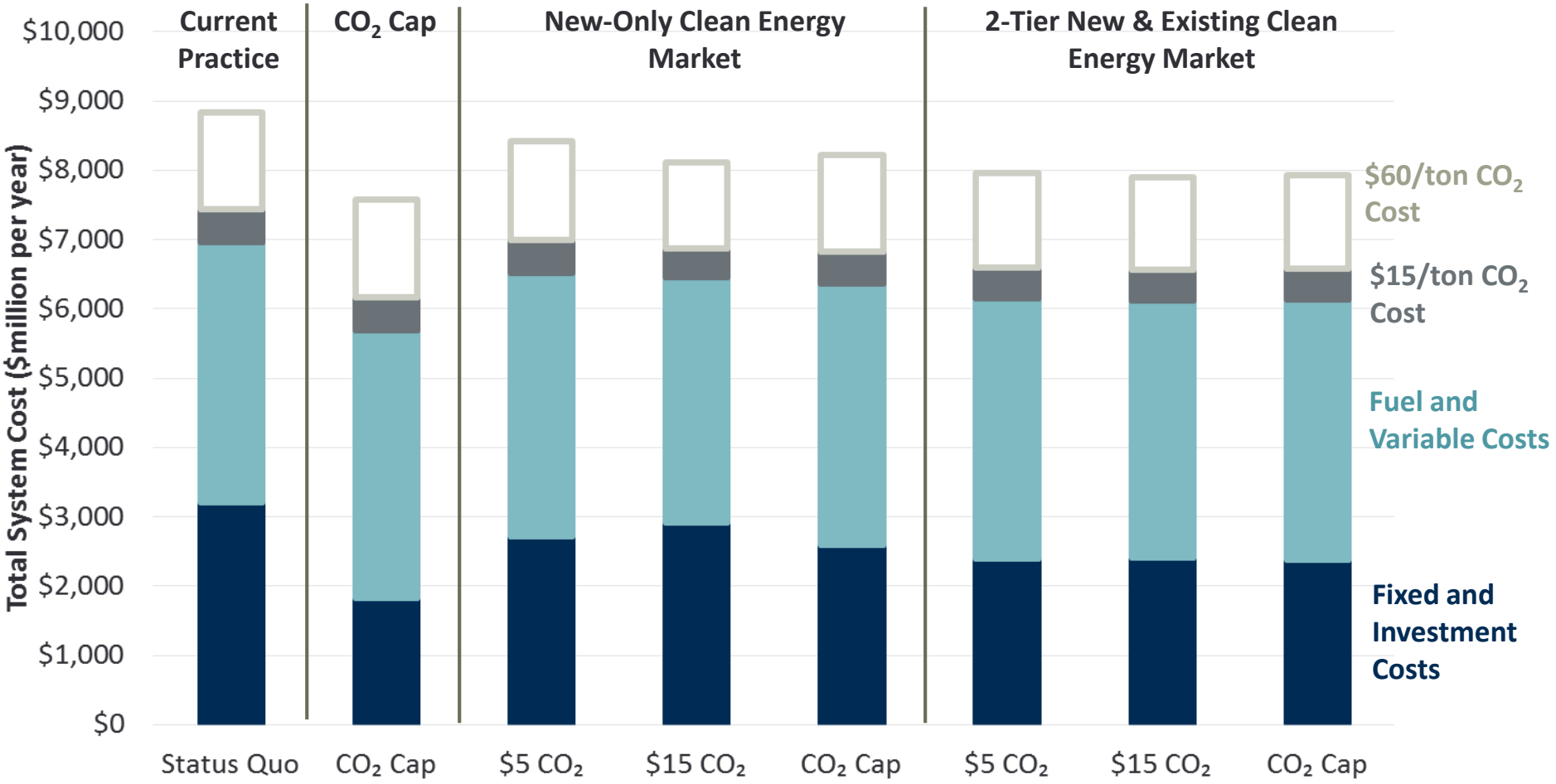
Change in Generation (2016-2029)



Modeling

Societal Costs with CO_2 Costs

- Societal costs are lowest with a CO_2 Cap and highest with Current Practice.
- Two-tier market is second most efficient, and would achieve lower costs if it also incorporated a dynamic clean energy product



Notes: Simple average of nominal costs from 2020-2029.

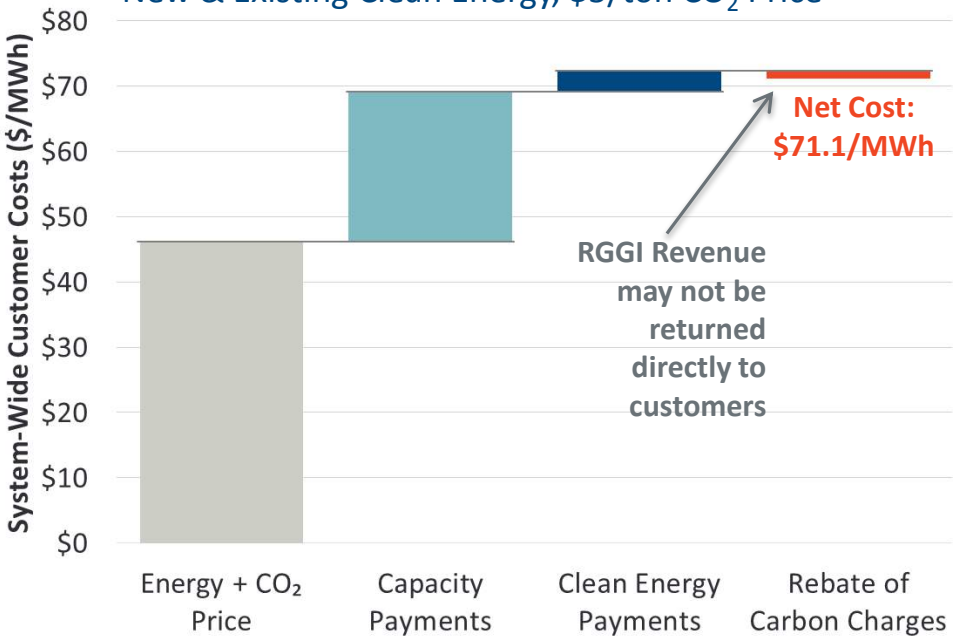
Modeling

Customer Cost Components

Energy, capacity, and clean energy payments are assessed to customers, with an offset from rebating CO_2 revenues from RGGI

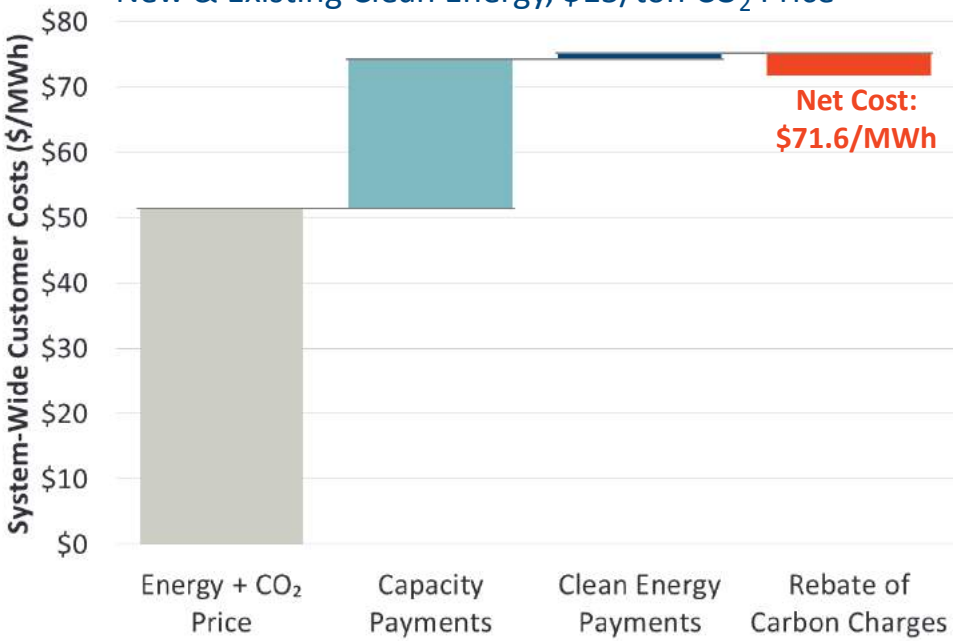
Customer Cost Components

New & Existing Clean Energy, $5/ton CO_2 Price



Customer Cost Components

New & Existing Clean Energy, $15/ton CO_2 Price

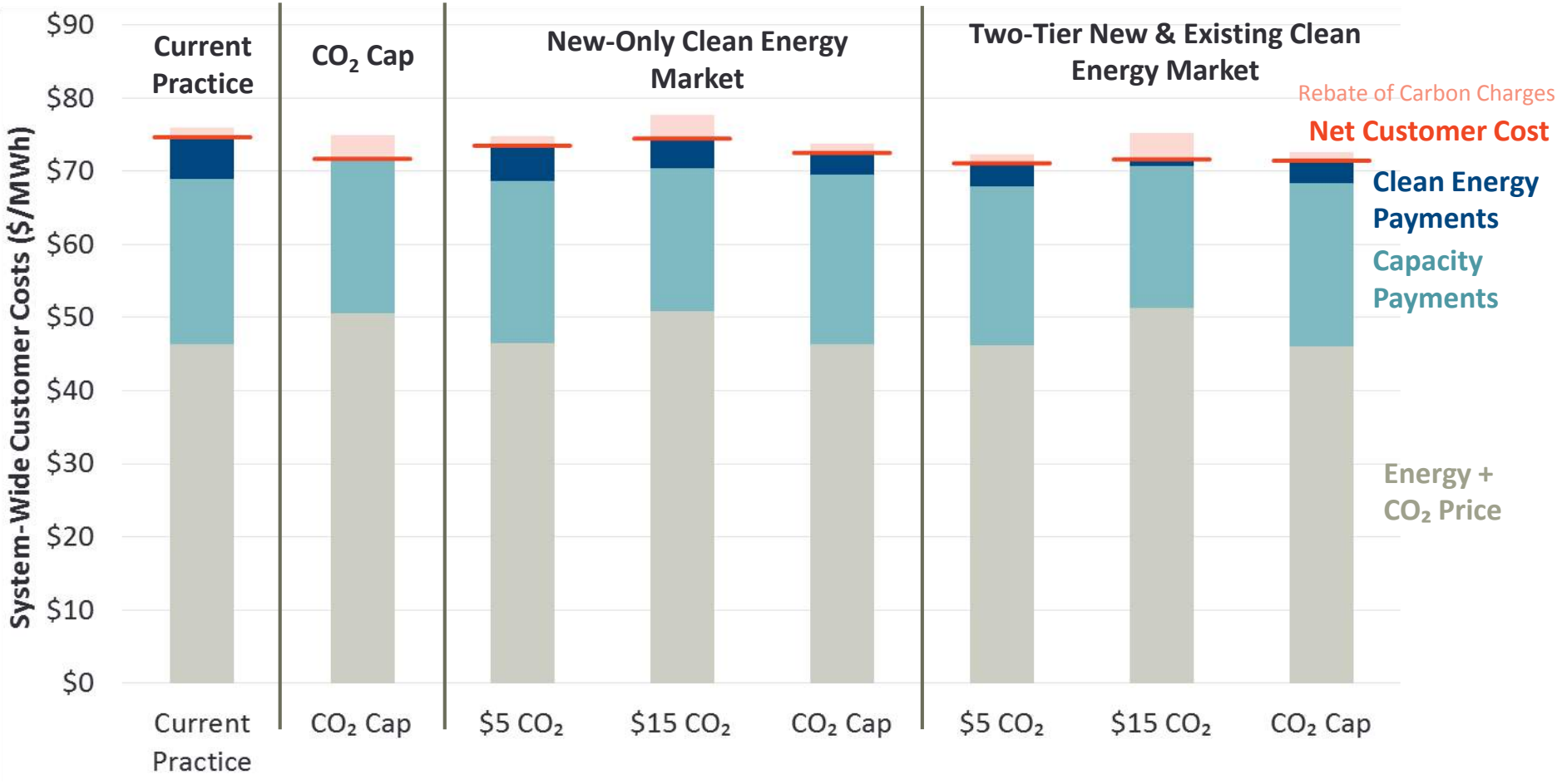


Note: Simple average of nominal costs from 2020-2029.

Modeling

Customer Costs

Current Practice and New-Only Clean Energy Market have the highest customer costs. Two-Tier and CO_2 Cap are more resource-neutral, translating to lower customer costs

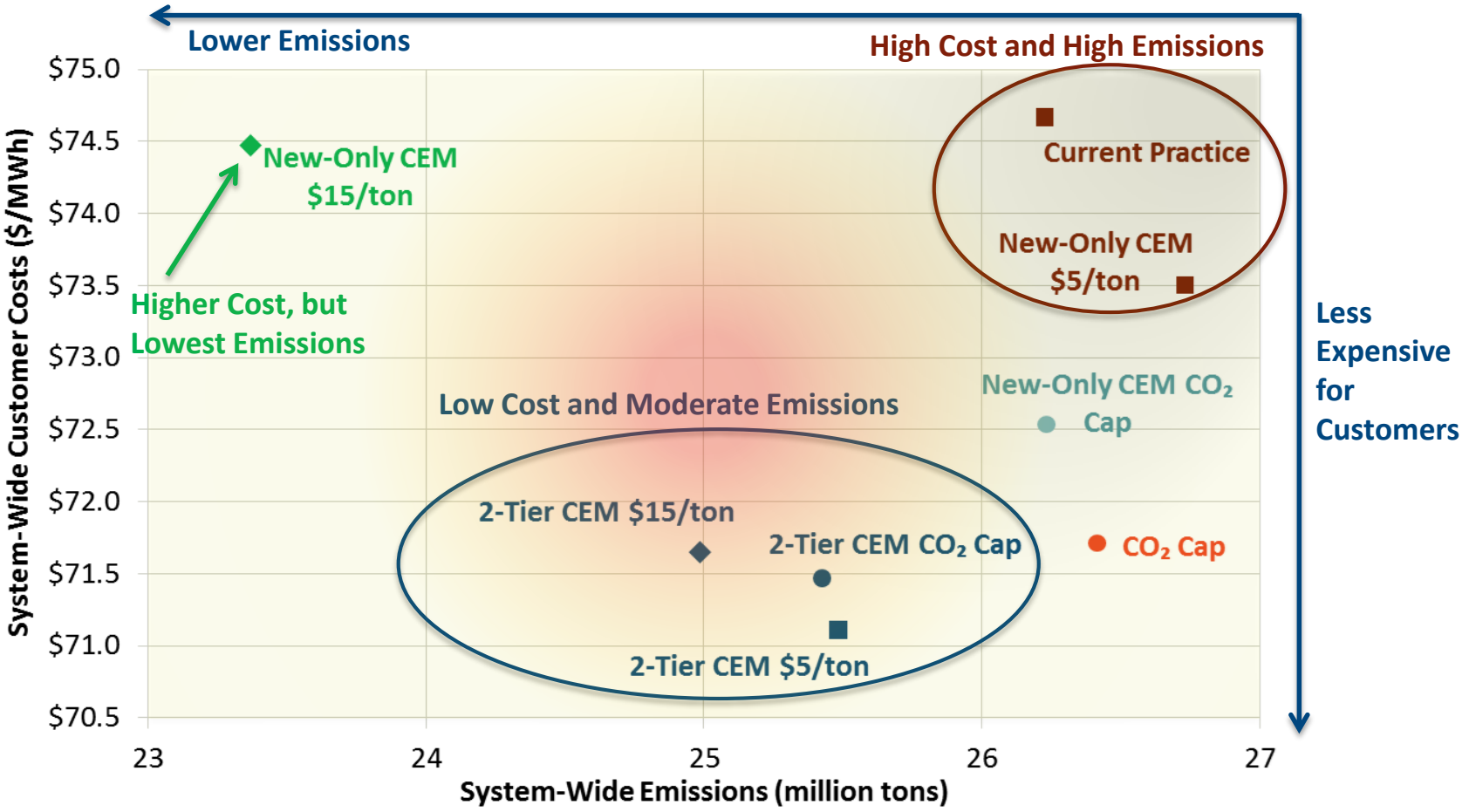


Note: Simple average of nominal costs from 2020-2029.

Modeling

Customer Cost Savings and Emissions Reductions

Preliminary simulation shows clean energy market (with $5/ton RGGI) **saves customers $440 million ($3.50/MWh)** and **reduces CO_2 emissions by 740,000 tons** per year relative to Current Practice



Note: Simple average of nominal costs and emissions from 2020-2029.

Modeling

Market Prices Across Scenarios

Simple Average Prices from 2020-29

		Current Practice	CO_2 Cap	New-Only Clean Energy Market			2-Tier Clean Energy Market		
				$5 CO_2	$15 CO_2	CO_2 Cap	$5 CO_2	$15 CO_2	CO_2 Cap
Electricity Market Prices									
Energy	*($/MWh)*	$46	$51	$47	$51	$46	$46	$51	$46
Capacity	*($/kW-year)*	$86	$88	$85	$83	$88	$83	$83	$85
Clean Energy Payments/Prices									
Solar REC	*($/MWh)*	$86	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Onshore Wind REC	*($/MWh)*	$35	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Offshore Wind REC	*($/MWh)*	$116	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New Clean Energy	*($/MWh)*	n/a	n/a	$53	$46	$38	$18	$15	$18
Existing Clean Energy	*($/MWh)*	n/a	n/a	n/a	n/a	n/a	$4	$0	$4
CO_2 Market									
Emissions	*(million tons/year)*	26.2	26.4	26.7	23.4	26.2	25.5	25.0	25.4
Price	*($/ton)*	$6	$16	$6	$18	$6	$6	$18	$6

Notes: Simple average of emissions and nominal costs from 2020-2029.

Modeling

Customer Costs Across Scenarios

Simple Average Customer Costs from 2020-29

				New-Only Clean Energy Market			2-Tier Clean Energy Market		
		Current Practice	CO_2 Cap	$5 CO_2	$15 CO_2	CO_2 Cap	$5 CO_2	$15 CO_2	CO_2 Cap
Customer Costs									
Energy	*($/MWh)*	$46.4	$50.5	$46.6	$50.8	$46.4	$46.2	$51.3	$46.1
Capacity	*($/MWh)*	$23.7	$24.4	$23.4	$22.9	$24.4	$23.0	$23.0	$23.4
Clean Energy	*($/MWh)*	$5.8	n/a	$4.8	$4.1	$3.0	$3.2	$0.9	$3.1
CO_2 Revenue Rebate	*($/MWh)*	($1.2)	($3.2)	($1.3)	($3.3)	($1.2)	($1.2)	($3.5)	($1.2)
Total Customer Costs									
Per Load MWh	*($/MWh)*	**$74.7**	**$71.7**	**$73.5**	**$74.5**	**$72.5**	**$71.1**	**$71.6**	**$71.5**
Delta Above (Below) Current Practice	*($/MWh)*		($3.0)	($1.2)	($0.2)	($2.1)	($3.6)	($3.0)	($3.2)
Total Market-Wide	*($million/year)*	**$9,373**	**$9,002**	**$9,226**	**$9,347**	**$9,105**	**$8,926**	**$8,994**	**$8,971**
Delta Above (Below) Current Practice	*($million/year)*		($371)	($146)	($26)	($268)	($447)	($379)	($402)

Notes: Simple average of nominal costs from 2020-2029.

Dominion Energy Services, Inc.
Rt 156, Rope Ferry Road, Waterford, CT 06385
Mailing Address:
P.O. Box 128, Waterford, CT 06385
DominionEnergy.com

Dominion Energy®

November 29th, 2017

Mr. William Space
Commonwealth of Massachusetts
Department of Environmental Protection
One Winter Street, 7th Floor
Boston, MA 02108

Re: Review of Options for Expanding the Clean Energy Standard

Dominion Energy Services, Inc., on behalf of Dominion Energy, Inc. ("Dominion Energy") appreciates the opportunity to provide comments on expanding the Clean Energy Standard pursuant to the review required by 310 CMR 7.75(10).[1] Dominion Energy offers the following comments for consideration.

Dominion Energy, Inc. and its Operations in New England

Dominion Energy is one of the nation's largest producers and transporters of energy, with a portfolio of approximately 26,400 megawatts (MW) of generation, 14,600 miles of natural gas transmission, gathering and storage pipeline, and 6,600 miles of electric transmission lines located throughout the United States, giving a diverse range of options and competing demands for future investment of capital, such as the substantial ongoing capital investments required to safely and efficiently operate a nuclear facility. Dominion's generation fleet includes three nuclear facilities that provide approximately 5,600 MW of baseload, carbon-free electric generation capacity. Dominion previously operated a nuclear facility in Kewaunee, Wisconsin, which is in the process of being decommissioned due to the economic challenges faced by that unit, notwithstanding its highly efficient operations. Among these remaining nuclear facilities, Millstone Power Station ("Millstone") located in Waterford, Connecticut is the only Dominion Energy nuclear facility operating in a restructured market. Millstone Power Station has been owned and operated by Dominion Energy since 2001. Millstone's two operating reactors generate 2,111 MW of carbon-free electricity.

Dominion Energy provided comments on the proposed CES on February 23, 2017. Those comments provided an overview of the numerous benefits that Millstone provides to New England. These include emissions, economic impacts, electricity price benefits, and others.[2]

In addition to Millstone Power Station, Dominion Energy also operates the Manchester Street Power Station, a 450 MW natural gas combined cycle facility located in Providence, Rhode Island. Dominion

[1] Massachusetts Department of Environmental Protection, 310 CMR Section 7.75 ("Clean Energy Standard" or "CES").
[2] http://www.mass.gov/eea/docs/dep/air/climate/gwsa-part-1-comments-3-2-17.pdf

has also previously divested significant generating assets in New England, including both the Salem Harbor and Brayton Point facilities in Massachusetts.

In addition to operating a clean, diverse traditional energy portfolio, Dominion Energy's generation fleet also includes more than 1,850 MW of renewable generation resources in operation or under development throughout the United States. Two of these facilities are located in New England: Somers Solar Center and Dominion Energy Bridgeport Fuel Cell. Dominion Energy has the majority ownership interest in the 5 MW Somers Solar Center, which began commercial operations in December 2013, and is located in Somers, Connecticut. Dominion Energy's 15 MW Dominion Energy Bridgeport Fuel Cell, located in Bridgeport, Connecticut, began operations in December 2013 and is the largest fuel cell power generation facility in North America.

Expanding the CES Option 2: The "CES-E"

The CES is limited to clean generators who have begun commercial operation after December 2010. However, a potential option for including existing clean generators in the CES is adding a separate requirement called the "CES-E".[3] The approach would require retail electricity suppliers to purchase clean energy certificates ("CECs") from existing clean generators in amounts consistent with historical data (i.e., amounts imported into Massachusetts). Eligible generators must not be involved in existing clean energy programs, and must have commenced commercial operation after 1990.

Dominion Energy commends MassDEP for evaluating expansion of the current CES by including existing clean generators. The considerable progress in emissions reductions from electric generators across New England would not have occurred unless a base of clean, non-emitting resources already existed. In order to maintain the rate of progress within the region, it is clear that retaining current non-emitting resources is a necessity. The proposed CES-E approach is viable with some modifications.

First, all clean, non-emitting generation throughout New England, regardless of historical Massachusetts import levels, should be eligible to participate in the "CES-E". Resources such as Millstone are regional resources that provide clean-air, stable electricity prices, and other benefits to all of New England. Massachusetts receives much of these benefits because approximately 50 percent of New England electricity is consumed in the Bay State.[4] Second, the MassDEP should remove the commercial operation date requirement. Any non-emitting, existing resource should be eligible for the "CES-E". The Global Warming Solutions Act of 2008 ("GWSA") requires reducing emissions based on 1990 levels.[5] MassDEP uses this date as the reason to limit the "CES-E" to generators with a commercial operation date after 1990, but this ignores the contribution to lower emissions levels that generators built prior to 1990 continue to make to this day. Failure to support all non-emitting generators could unnecessarily hasten their exit from the region and impede progress toward the goals in the GWSA and the CES.

---

[3] CES Stakeholder Discussion Document beginning p. 3.
[4] U.S. Energy Information Administration, *Massachusetts State Energy Profile*, June 16, 2016.
[5] M.G.L. c. 21N, § 3(b)(4), § 4(b)

Expanding the CES Option 3: Municipal Utilities

MassDEP is proposing a phase-in for Municipal Electric Departments and Municipal Light Boards ("Municipals") to meet the requirements of the CES beginning 2021.[6] Dominion Energy does not take a position on whether Municipals should be covered by the CES. However, if Municipals are required to meet the requirements of the CES, then those Municipals who have contracted for electrical output from existing, clean generating resources should have those contracts accounted for in their requirements.[7] Those Municipals should be rewarded for proactively procuring clean, inexpensive, and reliable electricity for their customers.

Conclusion

Massachusetts has an opportunity to support the continued operation of existing clean energy resources in New England. Supporting existing, clean, reliable resources will assist Massachusetts in continuing to meet its clean energy goals. By not valuing existing, clean generation, Massachusetts is potentially slowing progress towards a cleaner energy future.

Thank you for the opportunity to provide comments regarding the Massachusetts Clean Energy Standard.

Sincerely,

Kevin Hennessy
State Policy Director – New England
Dominion Energy Services, Inc.
Phone: 860-444-5656
Email: Kevin.R.Hennessy@dominionenergy.com

[6] CES Stakeholder Discussion Document beginning p. 5.

[7] Dominion Energy owns 93.47 percent of Millstone Unit 3. Massachusetts Municipal Wholesale Electric Company owns 4.8 percent and Green Mountain Power Corporation owns 1.73 percent of Millstone Unit 3.

Clean Power Northeast Development Inc.
101 Federal Street, Suite 1101 ● Boston, MA ● 02110

November 30, 2017

Martin Suuberg, Commissioner
Massachusetts Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Commissioner Suuberg:

Re: 310 CMR 7.75: Clean Energy Standard Review of Options for Expanding the CES Hydroelectricity supply from Nalcor, Newfoundland & Labrador

Clean Power Northeast Development Inc. (CPNE) wishes to thank the Department of Environmental Protection (DEP) for the opportunity to provide comments on Clean Energy Standard (CES) regulation (310 CMR 7.75).

CPNE's parent, Emera Inc., is a geographically diverse energy and services company headquartered in Halifax, Nova Scotia, Canada with approximately US$22.5 billion in assets and 2016 revenues of more than $3.1 billion. The company invests in electricity generation, transmission and distribution, gas transmission and distribution, and utility energy services with a strategic focus on transformation from high carbon to low carbon energy sources. Emera has investments throughout North America, and in four Caribbean countries.

On July 27, 2017, CPNE submitted the Atlantic Link proposal to the Massachusetts Request for Proposals for Long-Term Contracts for Clean Energy Projects (RFP). The Atlantic Link project is a proposed high voltage direct current (HVDC) transmission line that will deliver up to 1,000 megawatts (MW) of clean energy from Atlantic Canada directly to Massachusetts. The Atlantic Link will carry wind energy, balanced by hydro electricity from Newfoundland & Labrador and New Brunswick. The project will provide the Commonwealth, and the New England electricity system, long-term access to renewable energy at stable prices.

To ensure best value for the customers of Massachusetts, CPNE recommends that the CES be amended to recognize the hydroelectricity generated in the Province of Newfoundland &

Labrador as eligible under 310 CMR 7.75. By doing so Massachusetts would further enable the diversification of potential sources of eligible non-emitting energy supply. The consequential increase in competition would have a dampening effect on prices available to electricity customers in Massachusetts.

Clean energy from Newfoundland & Labrador is different from clean energy provided by other suppliers in control areas non-adjacent to NEPOOL. Nalcor Energy, the provincial Crown-owned utility that owns and operates the generation, is only interconnected to control areas that are adjacent to NEPOOL. Flows to New England can be effectively monitored, with no risk of transactions from elsewhere infiltrating the supply. Other than its interconnections with the Hydro Quebec Control Area and the Maritimes Control Area, Nalcor is electrically isolated. We respectfully request that you give consideration to this important distinction.

Thank you for offering us the opportunity to comment on the options for expanding the CES. We believe our recommended expansion of the CES provides price and supply benefits for Massachusetts electricity customers, and ask you to give consideration to the unique position of Nalcor Energy in the electrical landscape in your deliberations. I would be pleased to answer any questions that you may have.

Yours sincerely,

CLEAN POWER NORTHEAST DEVELOPMENT INC.

By: 

Name: Dan Muldoon

Title: President

EVERSOURCE ENERGY

247 Station Drive
Westwood, MA 02090

November 30, 2017

Ms. Sharon Weber
Deputy Division Director, Air & Climate Programs
Department of Environmental Protection
One Winter Street 7th Floor
Boston, MA 02108

Re: Eversource Comments on Amending the CES: The "CES-E" and Municipal Utilities

Dear Ms. Weber:

Eversource Energy Service Company, on behalf of NSTAR Electric Company d/b/a Eversource Energy ("NSTAR Electric") and Western Massachusetts Electric Company d/b/a Eversource Energy ("WMECO") (collectively "Eversource" or the "Company"), submits this comment letter to the Massachusetts Department of Environmental Protection ("MassDEP") in response to the request for comments from stakeholders on the MassDEP's proposed amendment to the Clean Energy Standard ("CES") regulations, 310 C.M.R. § 7.75, promulgated August 11, 2017. Eversource operates New England's largest utility system serving more than 3.6 million electric and natural gas customers in Connecticut, Massachusetts and New Hampshire. In order to meet its obligations to provide vital public services, Eversource ensures system reliability and safety standards are maintained in compliance with national, regional, and industry standards and policies.

Eversource values clean energy as an important part of the energy mix in New England, while ensuring costs to ratepayers remain reasonable and fair. The Company is committed to serving as a clean energy catalyst and leader in the region, pursuing Company-owned solar, storage and electric vehicle infrastructure.

Option for Expanding the CES: The "CES-E"

Eversource supports regulations that will be successful in reducing greenhouse gas emissions in a meaningful way at the lowest cost for Massachusetts customers. Additionally, Eversource recognizes that existing non- and low- emitting resources have contributed to the electric sector already achieving double the carbon reduction called for by 2020 in the GWSA[1]. However, the CES-E program as proposed by MassDEP in the Stakeholder Discussion Document[2] represents a carve-out to the CES for existing resources and Eversource discourages MassDEP to take this approach. While Eversource agrees that allowing existing non- and low-emitting resources to qualify for the CES is important to maintaining the electric sectors compliance with GWSA, we encourage MassDEP to allow all non- and low-emitting

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[1] *Statewise Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business as Usual Projection*, Massachusetts Department of Environmental Protection, July 2009.

[1] *GWSA Regulations – Emitting Electricity Generators Stakeholder Meeting*, Massachusetts Department of Environmental Protection, November 2016.

[2] *Review of Options for Expanding the CES: Stakeholder Discussion Document*, Massachusetts Department of Environmental Protection, October 2017.

resources to qualify for the CES instead of carving out a particular slice of CES annual compliance rate for these resources. Adding an additional carve-out would likely result in additional retail costs to Massachusetts customers.

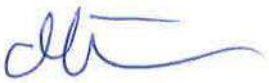
Options for Expanding the CES: Municipal Utilities

Eversource strongly agrees with MassDEP that municipal utilities should be included in the CES. Clean energy goals benefit all Massachusetts residents, and the costs incurred to achieve those goals should be borne equally by electric customers, regardless of whether they are served by an investor owned utility or a municipal electric company. Given the importance of these goals and the significant costs and efforts needed to achieve them, no entity should be exempt from compliance with MassDEP's regulations.

Eversource thanks the MassDEP for its careful consideration of these comments and the Company's recommendation and looks forward to continuing to work with MassDEP and other stakeholders to develop competitive, cost-effective solutions for meeting the Commonwealth's important energy and environmental goals. Eversource stands ready to assist with any aspect of the development and deployment of the CES amendments.

Should you have any comments or questions, please contact Katherine Wilson, 781-441-3789.

Sincerely,



Jeffery S. Waltman

Manager, Planning and Power Supply

November 15, 2017

Via email (climate.strategies@state.ma.us)

Hon. Martin Suuberg
Commissioner
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: Comments of Exelon Corporation on 310 CMR 7.75: Clean Energy Standard Review of Options for Expanding the CES

Dear Commissioner Suuberg:

Exelon Corporation ("Exelon") appreciates the opportunity to submit the following comments on the Clean Energy Standard, 310 CMR 7.74. Exelon has been an active participant in the stakeholder processes that provided input to the development of this rule and looks forward to continued participation in the Massachusetts Department of Environmental Protection's ("MassDEP") stakeholder process. To that end, Exelon offers the comments below in response to MassDEP's stakeholder discussion document on expanding the CES.

MassDEP should move forward with the adoption of a CES-E for existing clean energy resources.

In its discussion paper, MassDEP describes the option of "amending 310 CMR 7.75 to add a separate requirement to support existing clean generators (a "CES-E"). The purpose of the CES-E would be to encourage existing clean generators to continue to generate electricity for consumption in Massachusetts at current or historic levels." Exelon supports the creation of a CES-E for the reason suggested. To meet its obligations under the Global Warming Solutions Act, the Commonwealth must consider the emissions produced by all of the energy resources upon which it relies, not just those incremental additions which may be made going forward. To do otherwise ignores the effect that retirement of existing clean generation will have on attaining reductions from the 1990 baseline as directed by the GWSA. In particular, Exelon believes that it would be a dangerous mistake to take the continued operation of the region's carbon-free nuclear generation for granted. As experts have observed, "[t]he potential vulnerability of some nuclear power plants to premature retirement creates a major threat to the attainment of CO_2 reduction goals."[1] A CES-E, as proposed, may not be a complete solution to the economic challenges faced by nuclear generation but it will certainly make a positive contribution toward

[1] Nuclear Retirement Effects on CO2 Emissions Preserving a Critical Clean Resource, Brattle Group (2016). *See also,* C2ES: Losing nuclear power makes it harder to meet U.S. climate goals, Center for Climate and Energy Solutions (2014); Low Carbon Portfolio Standards, Raising the Bar for Clean Energy, Breakthrough Institute (2016); and generally Environment: Emissions Prevented, Nuclear Energy Institute, web post (2017).

their continued operation and, just as importantly, recognizes the environmental contribution made by these facilities for which they do not currently receive compensation on a par with many renewable energy resources.

Adoption of a CES-E should not include a vintage date.

In its discussion paper, MassDEP suggests limiting eligibility for a CES-E to resources that commenced commercial operation after 1990. Exelon believes the adoption of any vintage requirement has the potential to undermine attainment of carbon reduction goals. Resources that were in commercial operation as of 1990 and produce carbon-free electricity are no less important to avoiding backsliding from the 1990 baseline than resources that commenced operations later are to improving from the baseline. Indeed, there are very few nuclear generation sources anywhere in America that would be eligible under a 1990 cut-off and only one such resource exists in New England. For a CES-E to achieve the goal of avoiding a step backward in achieving carbon emission reductions, it must be open to all carbon-free resources in operation and providing power to the region that are not already supported by portfolio programs.

Existing Retail Electricity Sales Agreements should be exempt from the CES-E

The Retail Energy Supply Association and others made the case in connection with August 2017 adoption of the CES that existing retail sales contracts should be exempted through their term in order to avoid disruption and customer frustration in the retail electric market. In response to these comments, MassDEP granted partial relief in the form of a two-year exemption. To the extent adoption of a CES-E creates an additional obligation on retailers, an exemption for pre-existing contracts is appropriate for the same reasons. Exelon, therefore, urges MassDEP to grant an exemption for these contracts under a CES-E. While Exelon believes a full exemption is warranted, we suggest that at the minimum MassDEP should grant a two-year exemption consistent with CES as adopted in August 2017.

Should you have any questions about the foregoing, please do not hesitate to contact me at (603) 224-9653 or daniel.allegretti@exeloncorp.com.

Sincerely,

/s/ Daniel W. Allegretti

Daniel W. Allegretti
Vice President
State Government Affairs - East

November 30, 2017

FirstLight Power Resources Comments: 310 CMR 7.75 Clean Energy Standard Review of Options for Expanding the CES

Company Overview

FirstLight Power Resources (FLPR) is a hydropower, energy storage, and solar generation company with assets based in Connecticut and Massachusetts. Our 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 Northfield Mountain pumped hydro storage station and Rocky River pumped hydro storage station, which are respectively the largest and third largest energy storage facilities in New England. Existing pumped hydro storage is one of the greenest options for integrating and storing energy from intermittent resources such as wind and solar. Our facilities represent over a billion dollars of private investment in the region, employ one hundred twenty (120) people, and pay more than $16,500,000 in local property taxes.

Existing Clean Energy Resources Should Be Included in the CES

We appreciate the Massachusetts Department of Environmental Protection's (MA DEP) consideration of existing clean energy resources in this review of the Clean Energy Standard (CES). The CES as currently constructed precludes the participation of a significant number of clean energy resources that play a vital role in maintaining a low carbon generation fleet in New England. Excluding clean energy resources based on arbitrary vintage or size constraints unnecessarily threatens the Commonwealth's ability to achieve the greenhouse gas (GHG) reduction goals as set by statute, and FirstLight urges the DEP to allow all GHG emissions free resources that are not currently participating in the RPS or CES to qualify as a CES resource.

Conceptually the CES can create a competitive market in which clean energy resources can offer the environmental attributes required to attain Massachusetts' carbon reduction goals, including further optimization of operations to yield incremental carbon reductions. However, the current vintage requirements exclude existing resources from participating, creating a significant competitive disadvantage for these excluded resources which threatens their continued viability and weaken market signals to capture additional carbon reductions through improved operations at existing facilities.

As you are well aware, the industry is in the midst of a transition period. Our region is continuing its major shift from oil and coal energy resources to cleaner generation and, in many cases, renewable resources. Low natural gas prices are driving wholesale power prices to historically low levels. As a consequence natural gas units have become the most prevalent source of generation in New England. Existing GHG emissions free resources, such as hydropower, have largely been left out of consideration in policy initiatives and are instead left to justify continued (or changed) operations entirely on energy, capacity, and ancillary market revenues alone. Opportunities to preserve existing contributions and promote further carbon reduction improvements by hydro and pumped storage exist, but they may be missed absent incorporating their contributions into the CES.

While hydropower does not have fuel costs in the way that gas or oil plants do, there are substantial costs involved in their continued operation. Hydropower facilities involve similar types of turbine and generator equipment, yet investments and ongoing costs extend to additional infrastructure at dams, dikes, impoundments, river management and other activities. Property tax costs for hydropower facilities are often much higher than that of other resources given the large areas of land typically associated with the dam and impoundment and abutting area. Other significant costs arise from environmentally and recreationally based regulation, including compliance with shoreline management plans, water quality, erosion, recreational access, and many other requirements not accounted for by other technologies. In relicensing efforts, the burden of bearing these costs must be balanced with the benefit of accepting those burdens, and the revenue factors impacting that balance.

As wholesale market prices continue to remain at historically low levels, clean energy resources like hydropower are becoming less and less economically viable to operate. Many are foregoing efficiency upgrades to attempt to improve economics, and some are already in danger of being retired due to their high cost of operation. Obviously, reductions in hydro generation contributions negatively impacts carbon emissions in the region. In addition to the environmental and energy related impacts, plant closures would have a massive impact on local communities. FirstLight, for example, is one of the largest property tax payers in most of the communities in which we operate, providing millions of dollars in local property tax revenues to the municipalities. In western Massachusetts, the impoundments that we operate are also significant economic drivers for these communities through improved property values on and around the shoreline, commercial expansion opportunities, local retail business interests, and a myriad of other benefits. The closure of any of these facilities would have far reaching impacts in these local communities and maintaining the viability of these resources should be an important consideration in any future energy policy, including the CES.

Recommendations on the CES-E Proposal

Since the inception of the competitive market structure in New England ratepayers have enjoyed a highly reliable grid at a significantly lower cost than they would otherwise have under a regulated framework. Unfortunately existing market structures primarily address only cost concerns and do not provide for the valuation of additional attributes that are necessary to achieve public policy objectives such as decarbonization or economic development.

FirstLight has been a strong advocate for maintaining equitable competitive solutions to achieve desired public policy outcomes and we view the CES as one viable method to further incentivize the decarbonization of the electric sector. However, as stated previously, FirstLight views the segregation of existing GHG emissions-free resources from newer technologies as inappropriate and potentially harmful to achievement of the Commonwealth's GHG reduction goals. DEP's straw proposal to create a

separate CES-E program will force existing hydro resources to discount the carbon reduction value they provide and erect an unnecessary and inefficient barrier to what would otherwise be a truly competitive market for the valuation of vital environmental attributes. DEP's straw proposal to implement a 1990 vintage date would ensure that numerous resources, particularly hydropower resources, would once again be excluded from Massachusetts' energy policy. Unlike other technologies that have limited lifespans, hydropower facilities were designed to operate for generations. Instituting a 1990 vintage date would place many of these resources at risk, some potentially to the breaking point far sooner than is necessary and much to the detriment of the people of Massachusetts.

- **Recommended Option:** FirstLight urges the DEP to value desired environmental attributes equally regardless of vintage dates by allowing existing resources to qualify under the existing CES. This will maintain a level playing field for all emissions free resources to continue to supply Massachusetts' generation needs. We believe this represents the most equitable and desirable solution for the Commonwealth to maintain the clean energy resources that already provide emissions free generation while simultaneously incentivizing additional clean energy resources to enter the markets. To address potential concerns about an oversupply of CES qualified resources, FirstLight recommends that the DEP consider increasing CES requirements to better accommodate both new and existing resources and achieve price signals in the CES market that can encourage further carbon reductions from new and existing resources.

- **Option Two:** Should the agency continue to insist upon creating a separate class of CES resources FirstLight urges the DEP to allow hydropower resources built prior to 1990 to participate. Most, if not all hydropower resources in Massachusetts and the rest of New England were built prior to that date and supporting operations to further carbon reduction goals through these facilities would be in the interest of the Massachusetts consumers.

  Additionally, should the agency move forward with a separate class of CES resources FirstLight strongly recommends that the alternative compliance payment (ACP) be set at a much higher level than is currently contemplated in the straw proposal. If the ACP is set too low it will simply be easier for load serving entities to pay the fee as opposed to achieving the desired carbon reduction. If the DEP continues forward with a separate class of CES resources, FirstLight recommends that the Department set the ACP high enough to encourage the desired level of GHG reduction.

- **Option Three:** A third option that may address concerns raised by the agency while simultaneously allowing some existing resources to participate in the CES would be to allow resources that have received their license to operate in 1990 or later to qualify as a CES resource. The license, which in the case of Federal Energy Regulatory Commission (FERC) licensed hydropower facilities lasts up to fifty years, often involves investment and other costs to satisfy other regulatory, environmental, and community interests. While this would not enable all clean energy resources to participate in the CES, it would provide financial incentive to existing resources facing the challenges of incurring additional cost of operation or reducing their carbon reduction contributions.

- **Additional Thoughts:** FirstLight does not recommend that DEP limit CES qualifications based on the Greenhouse Gas Inventory or simply from states that have consistently exported "significant quantities of potentially eligible electricity in recent years" as this does not necessarily reflect the future realities on the electric grid. The regional system, beyond the Commonwealth's own

needs, may drastically change in future years. Limiting the CES may unnecessarily constrain Massachusetts' options to fulfill its GHG reduction needs. FirstLight also recommends against any capacity limit on resource eligibility as such a requirement would constitute an arbitrary limitation on participation.

Expanding the CES to Include the 2016 Energy Diversity Act Procurements

FirstLight has not offered a bid into the 2016 Energy Diversity Act request for proposals that were issued in response to that legislation and therefore does not take a position on the inclusion of the resources to be procured under the statute. However; FirstLight offers that the inclusion of these resources would almost assuredly include assets that are significantly larger than most if not all other qualified resources. If the DEP is to allow the 2016 Energy Diversity Act procurements to qualify under the CES, then it should not institute a capacity limit on other eligible resources. Such an action, in combination with planned procurements under the 2016 Energy Diversity Act, would constitute an arbitrary choosing of "winners and losers" and would be inconsistent with the statutory GHG reduction goals.

Municipal Utilities

FirstLight supports the phase-in of municipal utility participation in the CES as proposed by DEP.

Conclusion

The CES has the potential to significantly assist the Commonwealth in achieving its greenhouse gas reduction goals well into the future. Given the stakes involved, FLPR believes that existing emissions-free resources must be included in the CES in a fair and equitable manner, ensuring that Massachusetts will continue to maintain the vital resources it already has, and to capture opportunities to further their contributions, while simultaneously building new resources to achieve these goals.

Len Greene
Director, Government & Regulatory Affairs
FirstLight Power Resources
Len.Greene@firstlightpower.com

STATE OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS AND DEPARTMENT OF ENVIRONMENTAL PROTECTION

310 CMR 7.75 Clean Energy Standard – Expanding the CES: The 2016 Energy Diversity Act	))))))

RESPONSE OF GREAT RIVER HYDRO, LLC REQUEST FOR WRITTEN COMMENTS ON OPTIONS FOR EXPANDING THE CES

BACKGROUND

Great River Hydro, LLC ("Great River Hydro") appreciates the opportunity to submit the following written comments in response to the Executive Office of Energy and Environmental Affairs' (EEA) and Department of Environmental Protection's (DEP) request for written comments in the above referenced proceeding,

Great River Hydro owns and operates thirteen conventional hydroelectric generating facilities located on the Connecticut and Deerfield Rivers throughout Massachusetts, Vermont and New Hampshire. At a nominal rating of 584 MWs, our portfolio of forty-three generating units produces approximately 1.5 GWHRs of carbon-free generation annually. Our hydro portfolio contains hydro generating stations that range in size from less than 10 MW to more than 30 MW, with various sizes in between. In addition to providing energy, many of these units provide the ISO New England system with a reliable source of hourly operating reserves as well as play an integral role in the grid's system restoration procedures.

CES: Eligibility

CES eligibility as presently proposed is limited to resources that began commercial operation after December 31, 2010. Limiting CES eligibility to resources that began commercial operation after 2010 discounts the role that existing carbon-free energy resources have played over time and continue to play in mitigating state reliance on greenhouse gas emitting generation. Further this constraint does not take into consideration long term desirable system reliability attributes such as operating reserves that many existing carbon-free generators provide which support the inclusion of additional intermittent renewable resources across the region. Great River Hydro strongly encourages eligibility for all existing carbon free resources within the CES. Doing so will ensure the assets will be operated, maintained and, in the case of hydro facilities, relicensed

cost effectively for decades to come as Massachusetts and the region transition to an increased reliance on non-emitting intermittent renewable resources such as wind and solar. Further it will ensure state clean energy objectives are achieved as rapidly as possible at the lowest possible cost to Massachusetts rate payers. For these reasons, Great River Hydro strongly encourages the state to consider implementing a single CES classification absent any vintage requirements.

Should the classification move forward with a dual classification, i.e., CES and CES-E as proposed in the 310 CMR 7.75 Clean Energy Standard Review of Options for Expanding the CES Stakeholder Discussion Document, Great River Hydro strongly recommends removing any vintage restrictions in the CES-E eligibility criteria for the reasons cited above. While the above referenced Stakeholder Discussion Document proposes a 1990 vintage restriction, it would still significantly restrict existing non-emitting resource participation.

Should Mass DEP / EEA choose to implement a dual classification and a 1990 vintage restriction on existing resource eligibility, Great River Hydro strongly recommends eligibility consideration be given for FERC licensed hydroelectric projects that have been relicensed after January 1, 1990 up to December 31, 2010 for "existing" CES-E status and CES "new" status for projects receiving a new license from FERC after 2010. Unlike other renewable technology, FERC licensed hydroelectric projects are required to go through an extensive and often very costly relicensing process every 30 to 50 years. The relicensing process begins five and a half years prior to the operating licenses expiration date. The relicensing process involves extensive opportunity for public comment and consultation, as well as consultation with state and federal agencies as well as various other non-governmental stakeholders, completion of comprehensive environmental studies to determine project effects on resources, followed by the development of project mitigation and enhancement plans. A new operating license is issued only after FERC has determined the project represents the best public use of the waterway resource and a finding of no significant environmental impact. In addition to relicensing process expenses, which can cost tens of millions of dollars, future mitigation and enhancement plans required as part of the new license can commit project owners to tens of millions of dollars in future capital costs as well as potential lost opportunity due to enhanced operational restrictions.

Great River Hydro believes for the reasons cited above eligibility for CSE or CSE-E status should be predicated upon the project's current FERC license issuance date rather than a project's commercial in-service date.

HQUS

A subsidiary of Hydro-Québec

November 30, 2017

Via email to climate.strategies@state.ma.us

Massachusetts Executive Office of Energy and Environmental Affairs
100 Cambridge Street
Boston, MA 02109

Massachusetts Department of Environmental Protection
One Winter Street
Boston, Massachusetts 02108

Dear Sir/Madam:

H.Q. Energy Services (U. S.) Inc. ("HQUS"), a U.S. subsidiary of Hydro-Québec ("HQ"), is pleased to offer comments in response to the Executive Office of Energy and Environmental Affairs ("EEA") and Massachusetts Department of Environmental Protection's ("MassDEP") request for comments regarding options for expanding the Massachusetts Clean Energy Standard ("The CES") - 310 CMR 7.75- to include a separate requirement to support existing clean generators through a CES-E to encourage them to continue to generate electricity for consumption in Massachusetts at current or historic levels. As further set forth below, HQUS supports the creation of a CES-E and is committed to working with the Commonwealth on a design that can meet its objectives.

Hydro-Québec Background

HQ is one of the largest suppliers of clean energy in North America. Through functionally separated entities, HQ generates, transmits and distributes energy within the Province of Québec and exports electricity to external markets in Northeast North America including New England, our largest export market. For the past two years, HQUS has provided over 15 TWh (annually) of electricity to the six-state region.

Ninety-nine percent of electricity produced by Hydro-Québec Production[1] is renewable as it is generated from its hydropower system of more than 62 geographically diverse stations that comprise over 37,000 MW of capacity[2]. This hydropower fleet is supported by a system of 27 reservoirs that allow for 176 TWh of electricity to be stored for future use or to be dispatched to meet real time changes in

[1] Hydro-Québec Production generates power for the Québec market and sells its surpluses on wholesale markets.
[2] Besides its hydro fleet, HQP owns one gas-fired power plant that is used as a back-up generator.

consumer demand. An extensive network of over 21,000 miles of transmission reliably and efficiently delivers electricity to customers within Québec and to our external markets.

Close to 5000 MW of this capacity has been developed, constructed and brought online since the early 2000s. Just last month a 395 MW unit was commercialized at the La Romaine complex, Hydro Québec's newest hydropower installation located in the eastern region of the Province. The fourth, and final, unit of La Romaine will be brought online by 2020.

HQUS Position

HQUS supports the efforts of the MassDEP to establish a program (the CES-E) to maintain existing clean energy imports into the state. As is reflected in the stakeholder discussion document, HQUS has a history of delivering significant quantities of clean energy into New England -- and Massachusetts would like to maintain its share of these deliveries, and other existing clean energy resources, over the long term as its CES requirement for new clean energy resources increases into the future.

Existing clean energy is a cost effective resource available for compliance with the statewide greenhouse gas emissions limits under the Global Warming Solutions Act. In this regard, we believe it is productive for Massachusetts to take this step now to create a CES-E as it also faces a significant carbon reduction mandate, and as other nearby states and jurisdictions consider similar programs to obtain increased quantities of existing and new clean energy resources.

HQUS offers the following key points regarding the proposed CES-E design:

- HQUS supports the CES-E approach of setting a quantity requirement for existing clean energy resources based on historical clean energy deliveries from certain exporting regions.
- To meet the objectives of the CES-E and to benefit the Commonwealth, the MassDEP should ensure that historical clean energy delivery data, that are the basis for the quantity requirement, are accurate.
    - HQUS urges two important enhancements to improve the accuracy and effectiveness of the CES-E proposal. MassDEP should use the most recent import data available *.and* should account for energy originating from Québec that is wheeled through transmission networks in New Brunswick and New York in determining the existing clean energy quantity requirement.
    - Specifically, HQUS suggests an average value based on the most recent three-year period for ease of implementation and to adjust for any intra-year anomalies that occurred.

- The MassDEP should consider enhancing the CES-E so that it can more effectively meet the key design objective of maintaining existing clean energy resource levels over time. This could be achieved by allowing for replacement of existing clean energy resources that leave the market permanently -- with other existing clean energy resources eligible within the CES-E program.

- The level of the proposed CES-E Alternative Compliance Payment (ACP) must be set high enough to ensure the effectiveness of the program overall. In addition it should be adjusted over time to reflect the evolution of the value of such attributes in comparison to other states within New England and in the Northeast.

The Need for a CES-E

Today, the quantity of HQUS' energy deliveries are primarily based on the operation of New England's short term wholesale electricity markets. Generally higher pricing during summer and winter peak periods provide market signals for HQUS to deliver its energy in greater quantities. However, the environmental benefits of hydroelectricity and other clean resources are not currently valued through wholesale markets. As the market transitions to achieve deep penetration of clean and renewable energy sources there will be fundamental changes in how the market will value clean energy imports.

Public Policy Mechanisms to Determine Clean Energy Imports and Increasing Demand

Into the future, it will be public policy mechanisms, such as long-term contracts and carbon pricing within wholesale markets, which value the environmental attributes of clean energy resources that will be greater factors in determining where clean energy resources will be located and to which market they will deliver. The proposed CES-E is another public policy mechanism that can be used to provide value for the environmental attributes of existing clean energy resources and influence developer decisions to continue to operate and commit to deliver clean energy to Massachusetts.

Massachusetts will need to compete for clean energy against several jurisdictions in the broader Northeast North American market, all of which are making significant efforts to transition to a clean energy future on timelines that are comparable to those of the Commonwealth. For example, HQUS estimates that New England needs approximately 20 TWh of additional clean energy by 2025 to meet the initial requirements of the GWSA and that New York needs nearly 30 TWh to meet its 2030 mandate.

Maintaining Existing Level of Clean Imports

EEA's Clean Energy and Climate Plan for 2020 ("CECP") requires large quantities of clean energy, which will be challenging to achieve. Importantly, the CECP also assumes that existing clean energy generation levels are maintained. To the extent that existing clean energy generation levels attributable to Massachusetts are reduced, because resources have other market opportunities, the overall clean energy need will increase, and new clean energy resources will be needed as replacements. In this regard, the adoption of effective mechanisms like the CES-E to maintain existing sources and volumes of clean energy should be viewed as a way to secure some of the most cost-effective clean energy resources available *first* while new resources are developed and constructed.

HQUS observes that these changes have already begun to materialize throughout the Northeast region with other states adopting mechanisms that can secure clean energy resources on a long term basis, and which would no longer be available to be attributable to Massachusetts in the GHG inventory. Within

this context, Massachusetts is well served to go through this CES-E review process now and take timely actions to secure its existing clean energy resources.

Ensuring Clean Energy Value

An added benefit of establishing a CES-E mechanism for Massachusetts will be the certainty of ownership of the environmental attribute. Under the current inventory process, Massachusetts makes assumptions about its share of non-contracted clean energy from generation within and outside of New England, but there is no actual attribute transfer or guarantee that non-contracted clean energy will continue to be available to Massachusetts. HQUS' view is that this will become increasingly challenging and uncertain as clean energy requirements in various jurisdictions increase without attribute ownership and a mechanism to prevent double counting concerns. The proposed CES-E addresses these issues through the requirement that participation be based on tracking and certification of clean energy attributes.

HQUS supports the tracking and certification of environmental attributes required within the program and is willing to work with the MADEP to ensure the tracking of hydropower imports is appropriate.

Specific comments on the proposed market design

HQUS recognizes that one of the key objectives of the proposed CES-E market design, working in combination with the CES, is to avoid *"resource shuffling"* by securing existing levels of clean energy and adding more clean energy. As discussed further below, HQUS feels that establishment of both the CES-E and the CES could meet this objective.

Calculating the Quantity Requirement

Important to this objective is ensuring that the CES-E is as effective as possible in maintaining and maximizing historical clean energy deliveries into Massachusetts. As currently designed, the methodology used in determining the GHG inventory may underestimate the CES-E quantity requirement needed to maintain historical deliveries.

Specifically, the GHG inventory counts only generation directly delivered from the Hydro Québec control area into the New England control area as Québec-sourced clean energy deliveries. Significant Québec-sourced clean energy, several TWh/year, is also wheeled into New England through the New Brunswick and New York transmission systems. A portion of these deliveries contributes today towards reduced emissions in the Commonwealth. HQUS urges MassDEP to include these clean energy deliveries in the quantity requirement and would be pleased to provide assistance in determining those values.

HQUS also urges that the quantity requirement that is set for the CES-E program should include the most recent import data. Imports into New-England as well as the output of specific internal power plants are not static over time. By using older data the Commonwealth risks setting a quantity requirement that is out of date with the performance of historical resources. Certain power plants may no longer be able to provide expected benefits. Conversely, in the case of Quebec-sourced clean energy resources, exports to external markets have increased in recent years.

Using recent import data will increase the existing clean energy generation available to the Commonwealth through the proposed CES-E. In turn, it will avoid resource shuffling that could occur if not all historical clean energy deliveries into New England are available to be secured through the CES-E. HQUS suggests use of an average value based on the most recent three-year period for ease of implementation and to adjust for any intra-year anomalies that occurred.

Enhancing CES-E flexibility

The MassDEP should consider enhancing the CES-E so that it can more effectively meet the key design objective of maintaining existing clean energy resource levels over time. The stakeholder discussion document highlights the reliance on Pilgrim Nuclear station for historical clean energy resources but does not describe how these resources will be replaced through the program when the plant exits the marketplace. Without a way to replace this clean energy, consumers will be subject to non-compliance payments with no corresponding clean energy benefit and an outstanding need to replace a large clean energy resource quantity at some point in the future. However, this may be avoided by allowing other existing clean energy resources eligible within the CES-E program to replace existing clean energy resources, which could leave the market permanently.

Relationship to other clean energy programs

An existing generator should not be disqualified from creating CES-E credits if it participates "in other clean energy programs such as state energy portfolio standard programs.[3]" HQUS agrees that the MassDEP needs to avoid double counting the *generation output* of existing generators that are currently committed to clean energy programs or that may become eligible for future state energy portfolio programs. However, disqualifying all generators that participate in other programs is likely to significantly limit reliance on existing clean energy sources and promote resource shuffling.

HQUS delivers energy into New England as part of a long-term contract it has with Vermont utilities for clean energy and attributes. These clean energy deliveries are included in Vermont's Renewable Energy Standard. The deliveries contracted to the Vermont utilities should be attributed only to Vermont in the GHG inventory, but the same generators are also generating additional clean energy that is currently attributed to Massachusetts, because the magnitude of HQ deliveries into New England is well in excess of the delivery requirements of the Vermont contract. Those generators should be eligible to participate in CES-E. MassDEP can ensure that there is no double counting of clean energy generation by requiring CES-E participation, tracking, and settlement of attributes in the same manner as other environmental attributes, such as the states' RPS programs.

[3] Page 4, Review of Options for Expanding the CES, Stakeholder Discussion Document

Response to MADEP discussion draft and questions

The required review of options for including existing clean generators in the CES will include consideration of whether a CES-E can help maintain emissions reductions over time, how the CES-E structure described above compares with other options, and potential bill impacts of a CES-E (Page 5, Stakeholder Discussion Document).

HQUS supports the CES-E as an effective measure for maintaining emissions reductions over time. Implementation of the CES-E will assist in maintaining emissions reductions, because it is a mechanism specifically designed to retain existing clean energy resources for the Commonwealth. Because only existing clean energy from historical supply regions is eligible, it relies on proven suppliers and resources as the source of low carbon energy into the future. .

An important design element is the incentive level. It must be sufficient to retain the existing clean energy resource baseline. A CES-E incentive that is too weak or non-existent could cause the availability of existing clean energy resources to be reduced. In this regard, the payment level of the ACP will be very important. MassDEP should examine payment levels and incentives available to existing clean energy resources in other jurisdictions within New England as well as outside New England in setting its initial ACP level and should review and revisit the effectiveness of the ACP level after program experience has been gained to reflect characteristics of the clean energy market.

Are there eligibility requirements that are particularly important, such as limits on the size or location of clean generators, or technology specific requirements? (Page 5, Stakeholder Discussion Document)

HQUS understands the proposed CES-E to have a locational element based on historical deliveries of clean energy into New England. HQUS supports this approach as it will address the resource shuffling concerns described in the stakeholder discussion document. For example, if the eligibility criteria were broadened to include resources from other locations from which there is no historical tracking of deliveries to New England, it could result in a shuffling of resources if Massachusetts transitions from reliance on historical clean energy resources and supply regions to clean energy resources beyond New England and its adjacent control areas.

HQUS opposes any approach that would place limits on the size or technology requirements of hydropower generators eligible for the CES-E, and cautions that it is likely to significantly reduce the quantities of existing clean energy resources that can be maintained by Massachusetts through the proposal. Limitations of this nature are inconsistent with the fundamental approach of the proposed CES-E and the GHG emissions inventory, which aim to track Massachusetts' emissions profile and maintain historical levels of clean energy imports. As far as HQ understands, the GHG emissions inventory has not applied any type of size or technology limitation in determining historic levels of hydropower imports into the region. Therefore it is not appropriate to apply such a limitation to CES-E resources.

Include an alternative compliance payment (ACP) option to limit impacts on electricity rates. The per-MWh ACP amount could be set at a relatively low level (e.g., 10% of the RPS Class I ACP amount, or $7/MWh), reflecting the fact that the existing hydroelectric and nuclear generators that would be supported by the program have relatively low operating costs, and that their clean attributes (CEC-Es) are not valued in other markets. (Page 5, Stakeholder Discussion Document)

See the response to Question 1 above. HQUS urges that the incentive level of the CES-E be carefully considered and take into account initiatives in other states and markets to value the benefits of maintaining existing clean energy generation.

CES vintage requirement inconsistent with large hydropower development

HQUS believes that the proposal to require that clean energy imported to Massachusetts from outside New England demonstrate, using NERC tags, that the electricity was imported into New England through transmission capacity that came online after 2017, including through upgrades to existing transmission lines, is a sufficient and complete solution to the question of resource shuffling with respect to imports. In fact, this solution makes the CES's post-2010 "new" generation requirement entirely unnecessary.

HQUS understands that the post-2010 generation requirement is pegged to the publication date of the initial CECP that was required by the GWSA. However, the 2010 date is an arbitrary way of defining "new" generation in the CES, and is not aligned with the full design and development cycle for large hydropower resources, which is typically 10-15 years. Moreover, Massachusetts policy has already recognized that different clean energy resources types have different development cycles, and that accommodating for those differences is appropriate in implementing various mechanisms to achieve the requirements of the GWSA[4].

HQ is at the end of a build out of hydropower generation that began in the early 2000s, and has resulted in the construction of close to 5,000 MW of new capacity. The build out is ongoing with completion of the La Romaine complex set for 2020. This activity represents substantial investment by Hydro Québec in long-term anticipation of market opportunities for its clean energy in its external markets. HQUS urges MassDEP not to preclude Massachusetts consumers from having the opportunity to make use of its value in meeting CES and other climate related requirements.

The 2010 commercial operation date requirement should be eliminated because it does not provide any added carbon avoidance benefit to the Commonwealth. In fact, it will limit the supply that is able to

[4] For example, in enacting the *Energy Diversity Act*, St. 2016, c. 188, the Legislature identified three classes of clean technologies that are to be procured to enable the Commonwealth to achieve the GWSA targets, each with different vintage requirements: "Offshore wind energy generation" qualifies with a commercial operation date after January 1, 2018. "New Class I renewable portfolio standard eligible resources" qualify with "commercial operation prior to the date of execution of a long-term contract" or if they "represent the net increase from incremental new generating capacity at an existing facility after the date of execution of a long-term contract." Notably, the Energy Diversity Act does not restrict any "firm service hydroelectric generation" from qualifying based on its commercial operation date. Yet, the Legislature considered all of these resources to contribute to achieving the GWSA targets.

meet the CES requirement, and could result in the purchase of more expensive clean energy generation. HQUS observes that the recent MassDEP action to align the CES with the 83D process currently ongoing is consistent with this view.

Conclusion

HQUS supports the establishment of a CES-E mechanism in Massachusetts to retain its existing clean energy resources. With the changes outlined above to improve the accuracy of calculating the CES-E quantity requirement and to enhance the flexibility of the design, HQ believes that the proposal can meet the objectives of maintaining existing clean energy resources over time.

HQUS is also urging the MassDEP to reconsider the vintage requirement currently included in the main CES. As discussed above, this requirement is unnecessary and only serves to limit the quantity of additional clean energy that can be accessed by Massachusetts to meet its clean energy requirements.

Overall, HQUS feels that implementation of a CES-E, in combination with a CES that requires clean energy deliveries to be over new transmission, will ensure that the Commonwealth maintains existing clean energy resources, adds new clean energy resources, and avoids resource shuffling.

Sincerely,

Stephen C. Molodetz

Vice President, Business Development

H.Q. Energy Services (U.S.) Inc.

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November 30, 2017

Martin Suuberg, Commissioner
Massachusetts Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Re: **Comments on the *Review of Options for Expanding the Clean Energy Standard***

Commissioner Suuberg:

The Massachusetts Executive Office of Energy and Environmental Affairs (EEA) and the Massachusetts Department of Environmental Protection (Mass DEP) have solicited stakeholder comments on the possible expansion of the Clean Energy Standard (CES) established under 310 CMR 7.75. Nalcor Energy (Nalcor) appreciates the opportunity to submit the following comments and looks forward to working with the DEP as it considerers and finalizes changes to the CES.

Nalcor owns, operates and develops electric generating facilities in Newfoundland and Labrador and it is seeking to participate in Massachusetts retail providers' acquisition of clean energy. Nalcor's clean energy generation portfolio is comprised of units that were in existence on December 31, 2010 (and therefore are "existing" as defined in the Department's Stakeholder Discussion Document [SDD]) as well as the Muskrat Falls Generating Station which is currently under construction.

Under the CES regulation, as it currently stands, eligibility to earn CES credits is limited to electric generating units that emit little or no greenhouse gas (GHG) emissions (hereafter, "clean") that began commercial operation after December 31, 2010 (hereafter, "new"). The Department indicates that it plans to consider expansion of that regulation in order to maintain, as much as possible, the continued operation of generation units that have been delivering clean electricity generation to Massachusetts in the years leading up to and including 2010. These units are referred to in the SDD as "existing" clean generation.

The SDD addresses the policy issues that might apply if the DEP were to expand the CES to make "existing" clean energy generation eligible to earn clean energy certificates that retailers are required to hold under the CES. The Department describes the broad outlines of such a program, namely the Clean Energy Standard - Existing (CES-E). The program outline includes a compliance obligation on retail sellers of electricity in Massachusetts to obtain and hold CES-E credits and potential eligibility requirements for generators that would be able to earn such credits, among others.

Nalcor offers the following comments on the approaches generally described in the SDD.

1. A CES-E Compliance Obligation on Retail Sellers

The SDD suggests the addition to the CES regulation of a requirement that retail sellers demonstrate annually their use of a certain amount of clean generation from "existing" clean generation units. The revenue from the sale of such credits would encourage existing generators to continue their generation of clean electricity for consumption in Massachusetts following the implementation of the CES. (For example, the amount of the obligation for each retail supplier to purchase CES-E credits could be set at a level roughly equivalent to their pro rata share of the state's clean generation at current or historic levels.)

This would help maintain the supply of clean energy currently reaching Massachusetts and discourage generators from shifting that supply to other regions. For these reasons, Nalcor supports instituting a separate compliance obligation for retail sellers of electricity to purchase credits created by the operation of existing clean generation.

2. Vintage requirements

As long as there is a compliance obligation for the CES-E that is separate from the compliance obligation for the CES, there is no valid reason to limit CES-E certificates only to clean energy generation that pre-dated December 31, 2010. Clean generation built after 2010 that is nevertheless unable to meet the vintage transmission requirements of the CES should be allowed to qualify to earn credits under the CES-E program. If a new clean generation source utilizes existing transmission to deliver clean power to Massachusetts, it will either substitute new clean generation for existing clean generation or it will replace existing fossil generation with new clean generation. In so doing, it will help avoid a reduction in clean energy delivered to the state. Restricting CES-E to historic (pre-December 2010) generating units would needlessly limit clean generation supply of CES-E credits available to retail sellers of electricity.

Moreover, if "new" clean energy generation is allowed to compete against "existing" clean energy generation to earn CES-E certificates, that increased competition among supply sources may lower the costs to retail suppliers of CES-E compliance, and ultimately may cause some of those savings to flow to ratepayers. Nalcor urges the Department to allow for full and fair competition among clean electricity generators to earn CES-E credits, regardless of their vintage.

3. Locational restrictions

The SDD suggests that the Department might limit eligibility to earn CES-E credits only to those clean energy generation units located in a state or region from which Massachusetts has consistently imported significant quantities of clean electricity in recent years. Nalcor does not see any purpose such a restriction would serve. As long as the compliance obligation for retailers equals the current or historic amount of clean energy annually delivered to Massachusetts, the location of future supplies of clean energy needed to meet that obligation should not matter. Clean energy is clean regardless of where it is generated; unlike the impacts of, for example, NOx or SO2 emissions, the impacts of GHG emissions are independent of the location of their creation. Nalcor would not be supportive of such a restriction.

Likewise, the Department might be inclined to restrict the CES-E eligibility of units located outside of New England and its adjacent control areas. For example, as in the case of the CES, the Department might require that clean generation from outside these control areas be delivered to those areas using transmission built after December of 2016. The purpose of such a restriction in the case of the CES is said to be to minimize the chance that existing generation might be replaced by new generation, resulting in a lesser <u>net</u> increase in clean generation delivered to Massachusetts than the new clean generation would imply.[1/]

1/ While the vintage transmission requirement of the CES is not at issue in the development of the CES-E regulation, Nalcor takes this opportunity to re-state its belief that the requirement under the CES to use vintage (that is, post-2016) transmission to deliver power to Massachusetts in order to earn CES credits is an unnecessarily restrictive means to avoid shuffling (that is, the replacement of existing clean generation by new clean generation supplied to Massachusetts). It will result in the exclusion of a major potential source of clean energy from Newfoundland and Labrador (and likely elsewhere), reduce competition among clean energy generators and will ultimately result in higher costs for compliance with the CES to be borne by ratepayers. There are other less restrictive and less costly means to minimize shuffling, ones Nalcor has recommended to the Department in its comments related to the current version of the CES regulation. To those recommendations, Nalcor would add the observation that the creation of a CES-E compliance obligation will strongly encourage the continued delivery of existing clean generation to Massachusetts. It may well be the single most effective means to minimize the shuffling the Department seeks to prevent.

However, this would not be a necessary or appropriate requirement for a program designed to maintain the supply of existing clean generation to Massachusetts: there is no need to prevent "shuffling" in the case of existing clean generation. If a new clean generation source utilizes existing transmission to deliver clean power to Massachusetts, it will either substitute new clean generation for existing clean generation or it will replace existing fossil generation with new clean generation. In so doing, it will avoid any reduction in clean energy delivered to the state.

Nalcor urges the Department not to impose locational restrictions on the eligibility of clean generation units. Using NERC tags and contractual evidence of delivery of power to Massachusetts should be sufficient to confirm the delivery of clean generation from existing units and allow them to earn CES-E credits for doing so.

Again, Nalcor thanks the Department for the opportunity to provide these comments and your considered attention to them. I would be happy to answer any questions that you may have and look forward to working with you and other stakeholders to help Massachusetts meet its energy diversity and carbon reduction objectives.

Sincerely,

Greg Jones
General Manager
Nalcor Energy Marketing

nationalgrid

November 30, 2017

Via email to: climate.strategies@state.ma.us

Massachusetts Executive Office of Energy and Environmental Affairs
100 Cambridge Street
Boston, MA 02109

Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: Comments on CES-E and Municipal Utilities Options for Expanding the Clean Energy Standard

Dear Sir or Madam:

On behalf of Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid ("Company" or "National Grid"), I am pleased to offer comments on the CES-E and Municipal Utilities options for expansion of the Clean Energy Standard ("CES") regulations, 310 C.M.R. 7.75,[1] put forth for comment by the Massachusetts Executive Office of Energy and Environmental Affairs ("EEA") and the Massachusetts Department of Environmental Protection ("MassDEP").

On August 11, 2017, MassDEP promulgated the CES regulations. The purpose of the CES is to achieve greenhouse gas ("GHG") emissions reduction goals, as required by the Global Warming Solutions Act ("GWSA"), by establishing a CES that will increase the level of clean electricity that is purchased from the regional electric grid for consumption in Massachusetts. The CES is designed to function in a manner similar to and compatible with the existing Renewable Energy Portfolio Standard ("RPS"), 225 C.M.R. 14.00 *et seq.* and 15.00 *et seq.*, by requiring retail electricity sellers to annually procure a minimum percentage of "clean generation attributes" (sometimes called "CECs") that corresponds to a percentage of electricity sales. See, e.g., 310 C.M.R. 7.75(2) and (4). CECs are produced by any resource that meets the CES eligibility requirements which includes all RPS Class I resources and non-RPS Class I resources that are approved by MassDEP. CES obligations can be satisfied with RPS Class I Renewable Energy Certificates ("RECs") or from GIS Certificates associated with units approved by MassDEP.

[1] On October 30, 2017, National Grid submitted initial comments on the Massachusetts Executive Office of Energy and Environmental Affairs' and the Massachusetts Department of Environmental Protection's first option to expand the CES, which is to expand CES eligibility to include clean energy generation procured to align with the Energy Diversity Act of 2016 implementation.

The regulations require MassDEP to complete a review by December 31, 2017, including an opportunity for public comment, of options for including generators that meet all requirements of the CES except for the commercial operation date requirements in 310 C.M.R. 7.75(7)(a)2. and (b)1., and to review options for including annual standards for municipal electric departments, municipal light boards, and municipal light plants (collectively, "municipal utilities") in the CES. On October 6, 2017, MassDEP notified interested stakeholders of its proposals to expand the CES, and it convened several stakeholder meetings and requested written comments on these proposals.

CES-E

EEA and MassDEP's second proposed option for expanding the CES is to amend the CES to add a separate requirement to support existing clean generators, which is referred to as "CES-E". EEA and MassDEP requested stakeholder comment on this option, including responses to the following questions:

- *Is the CES-E approach described [in the 310 C.M.R. 7.75: Clean Energy Standard, Review of Options for Expanding the CES – Stakeholder Discussion Document] an appropriate approach for supporting existing clean generators? Are there other viable approaches?*
- *Are there eligibility requirements that are particularly important, such as limits on the size or location of clean generators, or technology-specific requirements?*

National Grid Comments: The purpose of the GWSA is to create a framework for reducing greenhouse gases to levels that scientists believe give us a reasonable chance of avoiding the worst effects of global warming. The CES is aimed at implementing this important policy goal. All clean energy resources play a vital role in helping the Commonwealth reduce its greenhouse gas emissions and avoid the impacts of global warming.

Among the options being considered, the best option for how to include existing facilities in the CES would be to allow all clean resources into the CES with its current percentage of electricity requirements, with no commercial operation date, size, or other restrictions, and to maintain the same Alternative Compliance Payments ("ACPs") for all CECs. The purpose of the CES is to achieve greenhouse gas emissions reductions. Existing resources are a very important part of achieving and maintaining those reductions. As MassDEP and EEA have noted in the 310 C.M.R. 7.75: Clean Energy Standard, Review of Options for Expanding the CES – Stakeholder Discussion Document ("Discussion Document") on review of options for expanding the CES, the loss of existing low- and zero-emissions generators prior to 2050 could make it more difficult to achieve the GHG emissions reductions required under the GWSA.

Including all clean resources in the CES also will allow competition to determine the best prices which we believe will be the most cost-effective for customers. Further, it is more cost-effective to maintain existing operational units than to build new units. Any asserted "windfall" to existing resources of being qualified under the CES is irrelevant, as both existing and new resources are contributing to emissions reduction goals.

It is unclear how a special CES-E would operate, whether as an additional obligation or as a carve-out from the current CES. Adding an additional CES-E obligation above and beyond the current CES obligation would be the worst option because it would lead to the highest costs for customers. It would be yet another obligation in addition to the existing CES, RPS Class I, RPS Class II, and Alternative Energy Portfolio Standards ("APS") requirements. Additionally, in 2050 the RPS Class II Waste Energy Minimum Standard and APS Minimum Standard will require 16% of electricity sales be from eligible resources, in addition to the 80% CES obligation. The RPS Class II Renewable Generation Minimum Standard, which is 2.6155% in 2018, is unknown in 2050 because it is calculated annually by the Massachusetts Department of Energy Resources. Thus by 2050 at least 96% of investor-owned utilities electricity sales will be from CES, RPS Class II, and APS resources. A CES-E requirement beyond the CES is simply not feasible as the IOUs already will be near 100%. Finally, a CES-E would add administrative complexity (and likely add additional administrative costs) to create a separate CES-E category that requires compliance, tracking, and reporting of compliance.

If EEA and MassDEP were to create a separate CES-E obligation, it should be created as a carve-out of a portion of the existing CES obligation, with its own vintage requirements and ACPs. Doing so would continue existing clean resources' contribution to the Commonwealth's GWSA goals. In such a case, National Grid would support EEA and MassDEP's recommendation that ACPs for CES-Es be 10% of the RPS Class I ACP amount, in order to provide a ceiling price, prevent high costs for CES-E CECs in shortage markets, and recognize that existing resources already are built.

Regardless of which option EEA and MassDEP select, all load-serving entities – including investor-owned utilities, competitive suppliers, and municipal utilities – should have the same obligation percentages for each requirement. All residential, commercial, and industrial customers in Massachusetts should contribute to the Commonwealth's efforts to achieve its GWSA goals. If only customers of investor-owned utilities ("IOUs") have to meet these percentage obligations, that is an unfair burden on IOU customers that is not being shared proportionately with other customers in the state. And, the non-IOU customers benefit from the resulting greenhouse gas reductions.

The Discussion Document suggests that to qualify for the CES-E, a generator cannot participate in other clean energy programs such as state portfolio standard programs. National Grid believes that generators that participate in other clean energy programs should be eligible for the CES-E. Excluding such resources would result in the CES-E consisting mostly of existing large hydropower from Canada and the Seabrook nuclear power plant because those types of resources are not eligible in other state portfolio standard programs. Renewable resources such as wind and solar that were unable to qualify for RPS Class I because they became commercial before December 31, 1997 most likely qualified for other state portfolio standard programs. These resources would receive less compensation than the Seabrook nuclear power plant because the state portfolio standard programs for pre-1998 resources often have REC prices that are significantly lower than the proposed CES-E ACP. Restricting CES-E to

resources that do not participate in other state portfolio standard programs would provide a windfall to Canadian large hydropower and the Seabrook nuclear power plant.

Additionally, the Discussion Document suggests that CES-E resources must be located in a state or region from which Massachusetts has consistently imported significant quantities of potentially eligible electricity in recent years. National Grid does not believe that this restriction is possible or logical. The RPS allows a resource within any state within the ISO-NE or a neighboring control area to qualify. 225 C.M.R. 14.05(5). A similar requirement would make sense for the CES-E. National Grid believes that these resources should qualify under the CES as well.

Municipal Utilities

EEA and MassDEP's third proposed option for expanding the CES is to address options for including municipally-owned electric utilities in the CES. EEA and MassDEP requested comments on this option for expanding the CES, including responses to the following questions:

- *What would be the best way to include municipal utilities in the CES? How could a CES-E address municipal utilities' relationships with existing clean generators?*
- *What are the relevant legal and contractual issues faced by municipal utilities as we consider options?*

National Grid Comments: The GWSA goals of reducing greenhouse gas emissions, and avoiding the impacts of global warming, are important goals for the entire Commonwealth. All residents of Massachusetts will benefit from achievement of these goals, and all residents of Massachusetts – including customers of municipal utilities – should contribute equally to achievement of these goals. Municipal utilities should be subject to the CES beginning January 1, 2018, on the same timeline that the IOUs are subject to the CES and with the same percentage requirements for electricity sales, without a separate phase-in period. There is an urgent environmental need now to further reduce greenhouse gas emissions, and delaying applicability of the CES to municipal utilities makes achieving that environmental goal more difficult. Further, having different requirements for IOUs than for municipal utilities creates disproportionate burdens for customers of IOUs verses customers of municipal utilities, where customers of IOUs are funding the CES for clean energy, compliance with the RPS, APS and other environmental goals, and the state's 2020 and 2050 emissions reductions goals. From 2012 through 2017, National Grid estimates that all IOU customers in Massachusetts (including customers who receive their electric supply from competitive suppliers) have spent over $3 billion to comply with the RPS Class I, RPS Class II, and APS requirements, while customers of municipal utilities have not been required to pay anything to comply with these obligations.

IOU customers will continue to have to pay for RPS Class II and APS obligations (in addition to paying for the CES and RPS Class I obligations that count toward the CES), so even if municipal utilities are subject to the same requirements of the CES as IOUs, customers of IOUs still will be making a disproportionately larger contribution to the state's climate goals. Additionally, municipal utilities' compliance with the CES would cost less than the IOUs'

compliance with the CES. This is because the majority of the IOUs' compliance with CES will be their compliance with their RPS Class I obligation, however the municipal utilities' compliance costs will derive solely from the CES. CECs that are not RPS eligible will have a lower ceiling price than RPS Class I RECs because of the lower CES ACP. The CES ACP is 75% of the RPS Class I ACP value for years 2018-2020, and then decreases to 50% of the RPS Class I ACP value thereafter. It is very possible that IOUs will have to procure RPS Class I RECs at higher prices than the CES ACP for the majority of their load in order to meet their CES obligation, whereas municipal utilities can meet their CES obligations with lower priced non-RPS CECs.

Additionally, not including municipal utilities in the CES would create a risk of "defection", i.e., more municipalities whose residents currently get their distribution service from IOUs exploring their own provision of electricity in order to avoid or reduce the costs of clean energy compliance obligations for their residents, resulting in fewer and fewer customers funding the CES obligations and contributing to the GWSA goals. Municipal utility customers currently represent approximately 15% of the electric load in the state, and even at that current level the state's GWSA goals cannot be met without their participation. While the GWSA requires reductions in greenhouse gas emissions by other entities covered under the GWSA such as the transportation sector, the reality is that the electricity sector already has made significant reductions in its greenhouse gas emissions but the transportation sector has not, and the transportation sector is now a much larger source of greenhouse gas emissions than the electric sector.[2]

Further, on average municipal utilities charge lower rates to their customers than do IOUs.[3] Part of this difference in rates is due to the fact that municipal customers have not been paying the charges for state renewables programs and other state policies including the RPS, APS, net metering, and long-term contracting that IOU customers must pay. In total, for National Grid residential customers these costs add up to approximately 4.84 cents per kilowatt hour.[4] There is, therefore, additional room on the bills for municipal customers to contribute to the costs of clean energy, including CES compliance costs.

If municipal utilities also are subject to the CES, this added demand from municipal utilities could raise the price of CECs in the short-term. This would result in more value for CEC generators and incent new generation, which should secure a supply of CECs for a longer period.

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[2] In 1990, the electricity consumption sector in Massachusetts had 28.2 million metric tons of carbon dioxide equivalent emissions ($MMTCO_2e$), or 29.8% of total emissions, and the mobile combustion sector had 30.5 $MMTCO_2e$, or 32.3% of total emissions. Massachusetts Clean Energy and Climate Plan for 2020: 2015 Update, at page 5, figure 2. In 2012, the electricity consumption sector had gone down to 15.8 $MMTCO_2e$, or 21.9% of total emissions, and the mobile consumption sector had essentially stayed the same, at 29.9 $MMTCO_2e$, but its relative percentage of emissions had increased to 32.3%. *Id.*

[3] See, e.g., http://www.mmwec.org/documents/annual-reports/mmwec-2016_2nd_version.pdf, at 3.

[4] These costs are broken out by program, per kilowatt hour, as follows: RPS/APS/CES, 2.23 cents; Energy Efficiency Program Charge, 2.083 cents; Renewables Charge, 0.05 cents; Renewable Energy Recovery Factor, .05 cents; and Net Metering Recovery Surcharge, .424 cents.

EEA and MassDEP clearly have the authority to apply the CES to municipal utilities. EEA and MassDEP have the authority to issue regulations requiring reductions in GHG emissions by all entities within the "electric sector", which includes municipal utilities. Specifically, M.G.L. c. 21N, section 3(c) gives the authority to the EEA and MassDEP to "set emissions levels and limits associated with the electric sector". "Electric sector" is a broad term and there are no entities that are listed as being excluded from that sector. As EEA and MassDEP note in their August 2017 "Response to Comment on 310 CMR 7.74 *Reducing CO_2 Emissions from Electric Generating Facilities*, 310 CMR 7.75 *Clean Energy Standard*", at page 19, "[g]iven the central role of the electric sector in achieving the required GWSA GHG emissions reductions of 25% and at least 80% by 2020 and 2050, respectively, it would be inconsistent with the goals of the entire GWSA scheme to exempt parts of the electric sector from regulations that require reductions in GHG emissions from that sector."

The Discussion Document lists a number of possibilities for how the CES could be applied to municipal utilities. The Discussion Document suggests a phase-in for municipal utilities, with a 0% requirement for 2018-2020. For 2021-2049, it suggests a lower standard for municipal utilities than for other retail suppliers, to account for the fact that municipal utilities are not subject to the RPS. It suggests two options, either: (i) starting in 2020, setting the standard at 6% plus a small fraction (1/30) of the 16% that will be required for non- municipal utilities, with the fraction going up by 1/30 each year; or (ii) discounting the standard for municipal utilities by the full amount of the RPS standard for the year.

National Grid does not support any form of a lower standard for municipal utilities than for IOUs. As noted previously, a lower standard for municipal utilities places a disproportionately higher and unfair portion of the costs of complying with the Commonwealth's emissions reductions goals on customers of IOUs and puts the Commonwealth further behind in meeting its GWSA goals. Customers of IOUs also will continue to bear the burden of costs for RPS Class II compliance, APS, Section 83 contracts (for some utilities) Section 83A contracts, net metering, and other environmental policy goals and requirements to which municipal utilities are not subject. In addition, IOU customers will be required to pay for additional programs in the future that municipal customers will not be required to pay for, including Section 83C contracts, Section 83D contracts, and the Solar Massachusetts Renewable Target (SMART) program. IOU customers are already bearing a much higher cost for achieving the Commonwealth's environmental goals than are customers of municipal utilities. In addition to these cost-based reasons, it is also important to apply the same standard to municipal utilities so that the Commonwealth can meet its emission reductions goals.

The Discussion Document also suggests that municipal utilities have longer financial planning and approval timeframes than public utilities, and that this is a reason to phase-in CES requirements for municipal utilities. However, municipal utilities should be able to come into compliance quickly with the CES. For example, National Grid purchases RECs on a short-term basis, and it would be very easy for municipal utilities to enter the market and meet their obligations by purchasing RECs on a short-term basis as well. There is an ample supply of RPS Class I RECs that can be used for compliance, and there are a variety of brokers who could

facilitate these purchases. Municipal utilities should not have difficulty meeting the CES obligations on their own, but if they do they could engage the help of a third party, possibly even an IOU. National Grid is open to having discussions with municipal utilities about helping them comply with the CES by providing this as a fee-based service.

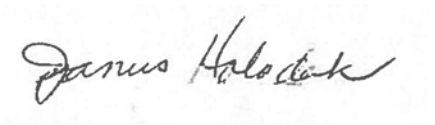
The Discussion Document also notes that some municipal utilities have ownership and contractual relationships with clean resources, but sell the RECs to other electricity sellers that are subject to the RPS. The Discussion Document proposes that if municipal utilities do not sell the RECs, they can subtract the MWh associated with these contractual and ownership interests from the calculation of the number of CECs required for compliance, or that they could use these RECs for compliance with the CES. National Grid believes that the latter option – using these RECs for compliance – would be the easier and simpler option, and is preferable. However, either option should be clarified to state that only resources that produce RPS Class I RECs or a new CEC should be allowed to comply with the CES if the current regulations are not changed. Non-RPS Class I resources (such as nuclear and large hydropower) should be considered for compliance only if both existing resources and new resources are allowed to qualify for the current CES, which National Grid supports, or if a CES-E is established.

* * *

National Grid appreciates the opportunity to comment on these proposed options for expanding the CES and thanks the EEA and MassDEP for their consideration of these comments. If you have any questions, please do not hesitate to contact me at 781-907-1000.

Very truly yours,

NATIONAL GRID



James G. Holodak, Jr.
Vice President, Regulatory Strategy and Integrated Analytics

cc: William Space, Massachusetts Department of Environmental Protection (william.space@state.ma.us)

November 30, 2017

Martin Suuberg
Commissioner, MassDEP
1 Winter Street
Boston, MA 02108

Re: 310 CMR 7.75: Clean Energy Standard – Review of Options for Expanding the CES

Dear Commissioner Suuberg:

Thank you for the opportunity to comment on the proposed options for expanding the Clean Energy Standard (CES), pursuant to the review required in 310 CMR 7.75(10). We thank the Department of Environmental Protection ("MassDEP," "the Department") for engaging stakeholders in a transparent and open manner and for extending the opportunity for public comment. The Northeast Clean Energy Council (NECEC) is appreciative of the Department's actions to date with regard to the CES. The considerations in this inquiry will have important implications for the future of Massachusetts' energy consumption and resource mix, including and especially as relates to the long-term and interim emission reduction targets mandated by the Global Warming Solutions Act (GWSA). We look forward to working with you to refine and implement the proposals in the coming months to keep the Commonwealth squarely on the path to incremental emissions reductions.

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 energy efficiency, renewable energy, energy storage, fuel cells, combined heat and power, and advanced and "smart" technologies. Many of our members are already doing business in Massachusetts, and many more are interested in doing so in the near future.

Options for Expanding the CES: The "CES-E"

NECEC appreciates the opportunity to comment on the proposed option for expanding the CES to include certain existing resources (the "CES-E"). We agree with the Department that this option merits close consideration, especially in light of the role that existing carbon-free resources will play in the state's achievement of GWSA-required emissions reductions. The retirement of existing low- and zero-emission resources will undoubtedly, as the Department acknowledges, make it more difficult for the state to successfully achieve its emissions reduction mandates. Given the disproportionate risk of retirement that small, older resources such as hydroelectric facilities face, the CES-E should indeed be pursued as a way to encourage such existing clean resources to stay online and continue to generate electricity for consumption in Massachusetts. Many of these valuable resources, which may face the burden of significant capital expenditures necessitated by ongoing repairs and maintenance, have the ability to cost-effectively deliver incremental low-carbon electricity into Massachusetts and contribute positively to the state's emission reduction efforts.

To balance the need for both new and existing resources, NECEC supports the creation of a CES-E that is separate from the main CES compliance obligation imposed on load serving entities (LSE) for clean energy attributes from new (post-2010) facilities. Our member companies own and operate facilities that span both new/existing and RPS/CES eligibilities, and we believe that the CES-E can be structured to accommodate and support all combinations thereof. This can be achieved without impinging on any one resource type's standing under the CES and without putting dissimilar resources in competition with one another. However, NECEC recommends several changes to the CES-E framework outlined in the Stakeholder Discussion Document to better enable Massachusetts to leverage existing resources to meet its environmental objectives quickly and cost-effectively.

Options for a "CES-E" Without Vintage Restrictions

For the new CES-E tier, we would strongly prefer an approach imposing a project size limit rather than a back-end vintage requirement. Currently, the Stakeholder Discussion Document contemplates a 1990 vintage restriction for the CES-E to address stakeholder concerns regarding the treatment of certain technology types. However, the proposed vintage restriction could return undesirable results by unnecessarily limiting the Commonwealth's ability to access valuable and competitive existing resources, including many small hydropower resources within and adjacent to ISO-NE. Avoiding an arbitrary vintage restriction will unlock many of those valuable resources and will enable more efficient and cost-effective outcomes for Massachusetts ratepayers. NECEC would suggest the Department establish a project size eligibility restriction, somewhere in the range of 30 to 50 megawatts (MW). A cap would qualify a larger pool of resources than the vintage restriction and also accomplish the original objective of DEP's proposed 1990 vintage requirement, improving overall CES-E competition and putting downward pressure on ratepayer costs.

Furthermore, removing a CES-E vintage restriction will prevent additional layers of unfair treatment for certain existing hydropower facilities. For example, hydropower facilities installed prior to December 31, 1997 that are larger than 7.5 MW are currently ineligible to participate in the state's RPS program. The current CES-E proposal, by contrast, would qualify only a small subset of existing hydropower facilities larger than 7.5 MW, i.e., only those built after 1990. This would create a secondary filter or cut-off in recognizing value from existing resources, and doing so would threaten to decrease the role that such existing zero-emission generators can play in cost-effectively achieving the mandates of the Global Warming Solutions Act.

In summary, we strongly recommend that the Department structure the CES-E tier with a project size limitation rather than a vintage restriction. Doing so will qualify a broader cross-section of valuable existing resources, better positioning the state to meet emission reduction goals and encourage continued resource operation at a lower cost to ratepayers.

Options for a CES-E with Modified Vintage Restrictions for Incremental ISO-NE Delivery and FERC Relicensing Dates

Should DEP feel that it must retain its proposal to implement the CES-E with a specific back-end vintage restriction, we would recommend two important modifications for the application of the CES-E vintage requirement. First, for existing resources located in control areas adjacent to ISO-NE, the Department should consider basing CES-E eligibility on the date resources began delivering energy into ISO-NE, rather than their date of commercial operation. Doing so would mean that DEP would determine the eligibility of an existing non-emitting resource in a

neighboring control area based upon the date the resource or transaction *became incremental* to the ISO-NE system, rather than the date the facility began operating. Under the vintage date proposed in the Department's review of options,[1] the CES-E would value and qualify any clean or non-emitting generation resource that became incremental to ISO-NE after 1990 and before 2011.

Secondly, for small hydroelectric facilities, we would recommend DEP consider using Federal Energy Regulatory Commission (FERC) relicensing dates rather than original commercial operation dates for purposes of determining resource eligibility under the CES-E.[2] As we understand it, the FERC hydro relicensing process is required for continued operation of non-federal hydro generation after the expiration of initial licenses, and completion of the process effectively results in the FERC granting a new license for re-started operations of a hydro generation facility. New FERC licenses are only awarded after a five-year or longer process that requires facility owners to perform extensive environmental studies, engage all local stakeholders, incur six- to seven-figure capital expenditures, and implement mandatory infrastructure upgrades. After that process is complete, a facility that is granted a new license is effectively operated as a new resource, meeting the highest and best state and federal environmental standards of the day, but also often incurring an 8-10% loss in facility energy output as a consequence. In light of this exhaustive process unique to hydropower facilities, NECEC believes that the Department should treat a re-licensed facility identically to a new hydropower facility achieving commercial operation within the same year for the purposes of the CES-E. Simply put, if the proposed CES-E vintage restriction (1990 or later) must be retained, a hydropower facility's eligibility under the program should be determined based upon the date of re-licensing rather than the date of commercial operation.

On this subject, we would also note that many of the hydroelectric facilities located in Massachusetts are small enough to operate under an exemption from FERC licensing requirements. Some of these facilities do not meet the technical requirements to qualify for RPS Class II despite their small size. We would recommend that these small facilities not face any vintage requirement for CES-E participation.

Taken together, the two recommendations – using date of incremental delivery into ISO-NE, and using date of FERC re-licensure – should be applied by the Department for any vintage or year restriction on resource eligibility in the CES-E. Both are reasonable applications and will serve the state well in leveraging the CES-E to, as it is intended, encourage the continued operation of valuable non-emitting resources.

Additional Considerations for CES-E Design

Outside of the two broad categories of options discussed above, several other CES-E design choices are also worthy of consideration. First, we believe that the CES-E should be structured as a single aggregate annual demand target, allocated to individual LSEs based on load share, similar to the RPS. Rather than, as DEP's review document suggests, requiring "retail electricity sellers to annually purchase clean energy certificates ("CEC-Es") from existing clean generators in amounts consistent with recent historical data, with quantities specified in MWh for each

[1] 310 CMR 7.75: Clean Energy Standard, Review of Options for Expanding the CES Stakeholder Discussion Document, pg. 5.
[2] We note that the Department should also consider the use of FERC relicensing dates in determining resource eligibility in the main CES tier/class.

category of existing clean generator (e.g., hydroelectric generators in Canada),"[3] more competitive outcomes will be achieved if the CES-E features an aggregate annual demand target allocated to individual LSEs based on respective load shares. This design would simplify the CES-E concept and promote more cost-effective results through a less rigid and prescriptive model. By creating a single product pool instead of slicing up the aggregate numbers to reflect historical deliveries by resource type, this design would avoid outcomes that might require LSEs to procure CEC-Es from costlier resource types.

Additionally, regarding alternative compliance payments (ACP) under a CES-E, we agree with other stakeholders that the ACP value must be high enough to incentivize an LSE to actually purchase and retire credits from resources qualified under the CES-E. For the CES-E to achieve its stated purpose, the level of the ACP must also be sufficiently high to ensure that the intended support for existing non-emitting resources actually occurs in a meaningful way. If the ACP is set too low, LSEs may be more inclined to pay the ACP rather than to actually purchase credits, or the resultant market prices may be insufficient to encourage existing non-emitting resources to continue operating and supporting the Commonwealth's carbon reduction goals. We share concerns that an ACP set at 10% of the Class I ACP, as proposed in the Stakeholder Discussion Document, will encounter these issues, potentially undermining the Department's efforts to maintain these existing resources in the near and long term. NECEC echoes other stakeholders' recommendations that the CES-E ACP be tied to a higher percentage of Class I ACP than currently proposed.

Options for Expanding the CES: Municipal Utilities

In our comments to the Department in February of 2017, NECEC extended its support for the Department's proposal to include Municipal Light Plants (MLPs) in the CES. Then and now, we view the incorporation of MLPs into the CES as consistent with the GWSA requirements to address all emissions across the state. While we were disappointed to see MLP compliance removed from the finalized CES regulations in August, we encourage the Department to renew the effort again and support phased-in CES compliance for all MLPs. Since MLPs are not subject to the RPS and not currently required to deliver minimum amounts of renewable energy, it is appropriate to gradually phase the MLPs in to full CES compliance and set the first compliance year as 2021. We view the proposed phase-in schedule[4] as preferable to the alternative option that would subtract the full RPS standard through 2050. In fact, we believe it would be reasonable to expect MLP compliance with the RPS and CES to arrive at alignment with other LSEs well in advance of 2050 – potentially as soon as the early-mid 2030 timeframe. We recognize that this effort is complicated for many reasons, but we support DEP's efforts to expand the CES to include MLP compliance and accelerate their CES obligation to achieve early alignment with other LSEs.

Conclusion

NECEC is grateful to the Department for its consideration of these comments. We look forward to continuing to work with MassDEP and other stakeholders to design and implement an optimal CES-E framework that provides support for beneficial existing carbon-free resources without

[3] 310 CMR 7.75: Clean Energy Standard, Review of Options for Expanding the CES Stakeholder Discussion Document, pg. 4.
[4] 310 CMR 7.75: Clean Energy Standard, Review of Options for Expanding the CES Stakeholder Discussion Document, pg. 6.

harming the market for new resources, along with an expanded CES phasing-in MLP compliance. NECEC would be glad to discuss any of our recommendations with you and reiterate that we are available as a resource throughout the remainder of the Department's review process. Please do not hesitate to contact us if you have any questions or we can provide any assistance.

Sincerely,

Peter Rothstein
President

Janet Gail Besser
Executive Vice President

Cc: climate.strategies@state.ma.us
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November 30, 2017

By Electronic Mail: climate.strategies@state.ma.us

Honorable Martin Suuberg
Commissioner
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

***Re*: Proposed Clean Energy Standard-Existing**

Dear Commissioner Suuberg:

With appreciation for the opportunity to comment and for the Department's on-going work to fashion efficient and effective programs and policies, NextEra Energy Resources (NEER) is pleased to provide comments on the proposed Clean Energy Standard-Existing (CES-E).

NextEra Energy Resources is a clean energy leader and is one of the largest wholesale generators of electric power in the United States, with approximately 19,990 megawatts of generating capacity. NEER, together with its affiliated entities, is the world's largest generator of renewable energy from the wind and sun. The business operates clean, emissions-free nuclear power generation facilities in New Hampshire, Iowa and Wisconsin as part of the NextEra Energy nuclear fleet, which is one of the largest in the United States.

NEER's interest in the Department's implementation of a CES-E principally arises from its majority ownership and operation of NEER's nuclear generating facility in Seabrook, New Hampshire.

NEER supports the Department's proposal to include existing clean generators that began commercial operation in and after 1990 and are located in a state or region from which Massachusetts has consistently imported significant quantities of electricity in recent years in a CES-E. Maintaining existing nuclear resources in the generating fleet serving the Massachusetts electricity market is an important component to lessening GHGs and meeting the

Commonwealth's Global Warming Solutions Act ambitions. The Commonwealth's environmental priorities can be best served if there is an allowance for Seabrook – a facility that demonstrates best-in-class operating history, including in reliability and durability, as well as compliance with applicable health and safety standards – to qualify for a CES-E.

Enclosed please find a report prepared by The Brattle Group in which the emission and cost impacts of retaining existing clean generators, including Seabrook, through a CES-E program are evaluated.

As always, NEER and its representatives are available at the Department's convenience to provide any additional policy, technical, operational or financial information or analysis related to its facilities or its experience in other jurisdictions.

Respectfully submitted,

/s/*Meghan Leahy*
Meghan Leahy
Director
Legislative and Regulatory Affairs
NextEra Energy Resources

enc.

Comments on Expanding CES Eligibility to Existing Nuclear Units

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November 30, 2017

THE Brattle GROUP

This report was prepared for NextEra Energy Resources. All results and any errors are the responsibility of the authors and do not represent the opinion of The Brattle Group or its clients.

Acknowledgement: We acknowledge the valuable contributions of many individuals to this report and to the underlying analysis, including members of The Brattle Group for peer review.

Table of Contents

Executive Summary

The state of Massachusetts aims to reduce its economy-wide GHG emissions 25% by 2020 and 80% by 2050, relative to the 1990 levels. As part of the regulations to achieve this goal, Massachusetts has recently introduced a new regulation, the Clean Energy Standard (or "CES"), that requires load-serving entities in Massachusetts to procure electricity from low-emitting resources that came online after 2010.[1] The Massachusetts Executive Office of Environmental Affairs (EEA) and the Massachusetts Department of Environmental Protection (DEP) are seeking stakeholder input on the implications of potentially shifting the commercial operating date requirement to an earlier date so that some of the existing clean generators (such as the Seabrook nuclear plant) can also participate in the CES program. In particular, the EEA and the DEP requested comments on an option to expand the CES program by implementing a separate requirement ("CES-E") in addition to the current CES requirements to support clean generators that came online between 1990 and 2010, and are located in a region or state that has been consistently exporting clean energy to Massachusetts. Based on our review of the historical generation and import data provided in Massachusetts' GHG inventory and other public data, we estimated that there would be 17 TWh of existing clean generation meeting the extended vintage and locational requirements, of which approximately 9 TWh would serve Massachusetts' load and thus qualify for the proposed CES-E program.

In this study, as summarized in Figure 1, we evaluate the cost and emission impacts of retaining existing clean generators through a CES-E program, compared to two scenarios: (a) without these existing clean generators and (b) without these existing clean generators, but with additional new clean resources replacing their output.

[1] Massachusetts DEP, "310 CMR 7.75 Clean Energy Standard", August 2017, posted at: http://www.mass.gov/eea/docs/dep/air/climate/3dregc-ces.pdf

Figure 1: 2017–2030 Average Cost and Emission Impact of Retaining Seabrook and Other Existing Clean Generation under the CES-E Program

	Relative to Existing Clean Offline	Relative to Existing Clean Replaced w/ New Renewables
ISO-NE Total CO_2 Emissions	6.8–7.0 MMT/yr ↓	0.4 MMT/yr ↓
Massachusetts' Share of CO_2 Emissions	3.6 MMT/yr ↓	0.1 MMT/yr ↓
ISO-NE Total System Costs	$71–$210 million/yr ↓	$1,105–$2,382 million/yr ↓
Massachusetts Customer Costs		
With $7/MWh ACP	$136–$157 million/yr ↓	$481–$1,200 million/yr ↓
With $35/MWh ACP	$120–$141 million/yr ↑	$203–$922 million/yr ↓

We conclude that retaining the existing clean generators under the CES-E program (including the Seabrook nuclear plant) would result in the following impacts on average during the period 2017-2030:

- A reduction of 6.8–7 million metric tonnes of CO_2 emissions per year for the entire ISO-NE region, relative to a scenario without the existing clean generators.
- A reduction of 3.6 million metric tonnes of CO_2 emissions per year to serve Massachusetts electric load relative to a scenario without the existing clean generators, which would allow the state to keep its electric sector-emissions below the 2020 target of 11–14 million metric tonnes and help towards meeting its long-term economy-wide emission reduction goals beyond 2020.
- ISO-NE system cost savings of $71–$210 million per year relative to a scenario without the existing clean generators, driven by the reduced production costs from fossil-fuel generation more than offsetting the cost of existing clean generation. The system cost savings would be $1,105–$2,382 million per year relative to a scenario where the output of existing clean generators is replaced with new renewable generation, due to the avoided new renewable procurement and transmission costs associated with the 17 TWh of additional wind generation.
- $136–$157 million lower annual electric customer costs in Massachusetts relative to a scenario without the existing clean generators, assuming that the generators eligible under the CES-E program are paid $7/MWh on average (equal to 10% of RPS Class I Alternative Compliance Payment, or ACP) for their clean energy attributes. The estimated savings in customer costs are driven by the reduced energy and capacity prices

over the period 2017-2030. If the price paid on clean energy credits were set higher at $35/MWh (equal to 50% of RPS Class I ACP), Massachusetts customer costs would increase by $120-$141 million per year.

Note that the reduction in energy and capacity prices would also lead to lower generator revenues, which would offset these savings from a Massachusetts system cost perspective.

- $481–$1,200 million lower annual electric customer costs in Massachusetts relative to a scenario in which the output of existing clean generators is replaced with new renewable generation, assuming that the generators eligible under the CES-E program are paid $7/MWh for their clean energy credits. The estimated savings in customer costs are largely driven by the higher cost of building and operating new renewable generation and the associated new transmission allocated to Massachusetts, relative to the cost of existing clean generation under the CES-E program. The range of savings in customer costs would be lower at $203–$922 million per year if the price paid on clean energy credits is higher at $35/MWh.

  The simulated market price levels are similar in the two scenarios we analyzed (retaining existing clean generators vs. replacing their output with new renewables), therefore, the effects on generator revenues would be limited and savings from a Massachusetts system perspective would be comparable to the range of estimated customer cost savings shown above.

I. Overview and Conclusions

The Global Warming Solutions Act (GWSA) signed in 2008 requires state economy-wide GHG emissions in Massachusetts to be reduced 25% by 2020 and 80% by 2050, relative to the 1990 levels. In order to achieve these targets, Massachusetts will need significant emission reductions across all sectors and its electricity sector may have to decarbonize more deeply on a percentage basis than other sectors. Accordingly, state legislation has introduced various policies and programs including increased energy efficiency goals, renewable portfolio standards (RPS), participation in the Renewable Greenhouse Gas Initiative (RGGI), and most recently the Clean Energy Standard (CES) under the regulation 310 CMR 7.75. Under the new policy, the CES requires load-serving entities in Massachusetts to procure electricity from eligible clean resources with a target that starts at 16% of load served in 2018 and grows 2% per year until it reaches 80% by 2050. The current CES rules allow low-emitting generators with lifecycle GHG emissions of at least 50% below those from the most efficient natural gas generator to qualify towards meeting CES if they commenced operation after December 31, 2010.[2] Due to this vintage requirement, clean generation resources that came online prior to December 31, 2010 are currently not eligible to meet the state's CES targets.

The Massachusetts Executive Office of Environmental Affairs (EEA) and the Massachusetts Department of Environmental Protection (DEP) are seeking stakeholder input on the implications of potentially moving the commercial operating date requirement to an earlier date so that some of the existing clean generators (such as the Seabrook nuclear plant) are included as part of the CES program.[3] In particular, the EEA and the DEP requested comments on an option to expand the CES program by implementing a separate requirement ("CES-E") to support clean generators that came online between 1990 and 2010, and are located in a region or state that has been consistently exporting clean energy to Massachusetts.[4] The quantity of requirements under the CES-E program would be set at recent historical levels of electricity imported from existing clean generators to Massachusetts. The primary driver of this consideration is to align the CES

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2 Massachusetts DEP, "Fact Sheet, Electricity Sector Regulations", August 2017, posted at: http://www.mass.gov/eea/docs/dep/air/climate/3dfs-electricity.pdf.

3 Massachusetts EEA and DEP, "Review of Options for Expanding the CES Stakeholder Discussion Document", which will be referred at "Stakeholder Discussion Document" in the rest of this study, posted at: http://www.mass.gov/eea/docs/dep/air/climate/shp-ces.pdf

4 *Id.*, pp. 4-5.

with the state's decarbonization goals, recognizing that without expanding CES eligibility some of the existing clean generation may not have sufficient economic incentives to remain online going forward, which would be detrimental to achieving the state's long-term GHG reduction targets.

In this study, we evaluate the cost and emission impacts of retaining existing clean generators through a CES-E program, compared to two scenarios: (a) without these existing clean generators ("Existing Clean Offline" scenario) and (b) without these existing clean generators, but with additional new clean resources replacing their output ("Existing Clean Replaced" scenario). In particular, we estimate the contributions of these potential CES-E eligible resources towards achieving Massachusetts' GHG reduction targets through 2030. We also present our findings on the estimated costs associated with the CES-E program, in comparison to the costs of replacing the clean generation from these existing resources with additional new renewable resources needed to achieve similar GHG emission levels.

We quantify two separate cost metrics in our study: The first metric is the impact on total system costs in ISO-NE, which includes changes in system-wide production costs, market purchase costs for imports from external regions, investment costs for new resources, other fixed costs (FOM and ongoing CapEx) for new and existing resources, and transmission costs associated with incremental renewable buildout. The second metric is the impact on customer costs in Massachusetts, which reflects market price effects (energy and capacity) as well as the changes in Massachusetts' clean energy procurement costs including state's share of costs for the associated transmission needs.

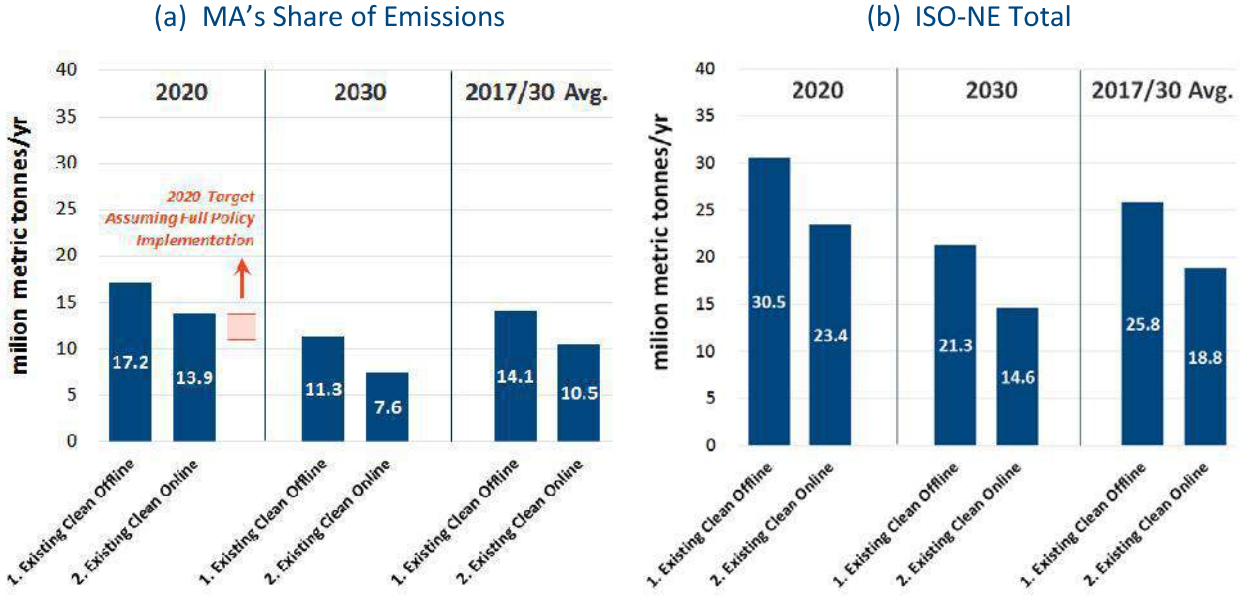
Our key conclusions are as follows:

- **Existing clean generators serving load in Massachusetts, including a portion of Seabrook, are contributing to achieving Massachusetts' GHG reduction targets by 2020 and lowering emissions in the ISO-NE region, and can continue to do so in the future.**

  Massachusetts' GHG emissions from electric sector would increase by 3.3 million metric tonnes in 2020 and by 3.8 million metric tonnes in 2030 unless the output from existing clean energy generators is replaced by additional new renewables. Without the existing clean generators, Massachusetts' GHG emissions from the electric sector would reach 17.2 million metric tonnes in 2020, and exceed the target of 11-14 million metric tonnes to achieve the

economy-wide GHG reductions under the GWSA. Retention of existing clean generators also reduces GHG emissions in the ISO-NE region by about 7 million metric tonnes per year.

Figure 2: Projected CO_2 Emissions in Massachusetts and the ISO-NE Region



Sources and Notes:

Brattle analysis.

The targets for Massachusetts electric-sector GHG emissions in 2020 reflect full policy implementation projections from Massachusetts Executive Office of Energy and Environmental Affairs (EEA)'s "2015 Update of the Clean Energy and Climate Plan for 2020", posted at: http://www.mass.gov/eea/docs/eea/energy/cecp-for-2020.pdf

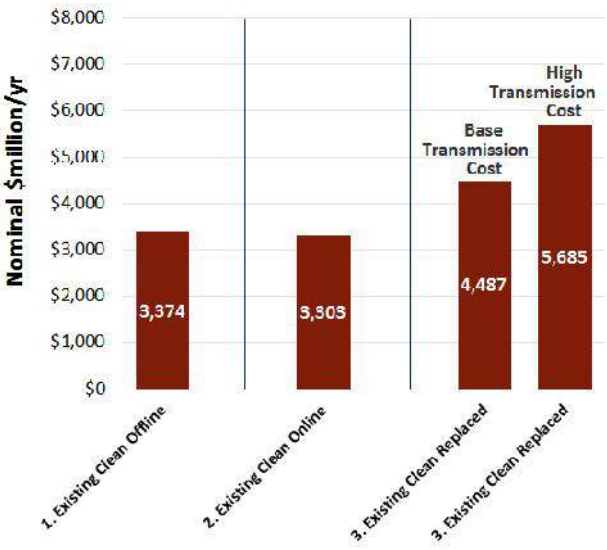
- **Total system costs in the ISO-NE region would be lower under the proposed CES-E program by $1.1- $2.4 billion per year on average during the period 2017-2030 relative to the cost of replacing the output of the existing clean generators with 5 GW of additional new renewables.**

  The range in total system cost savings reflects the assumed prices of natural gas and RGGI GHG allowances in the future, and the uncertainty in the cost of new renewables and associated new transmission investment.

Figure 3: Total System Costs in the ISO-NE Region

(a) Base Market Outlook

(b) Low Gas/RGGI Prices



Sources and Notes:

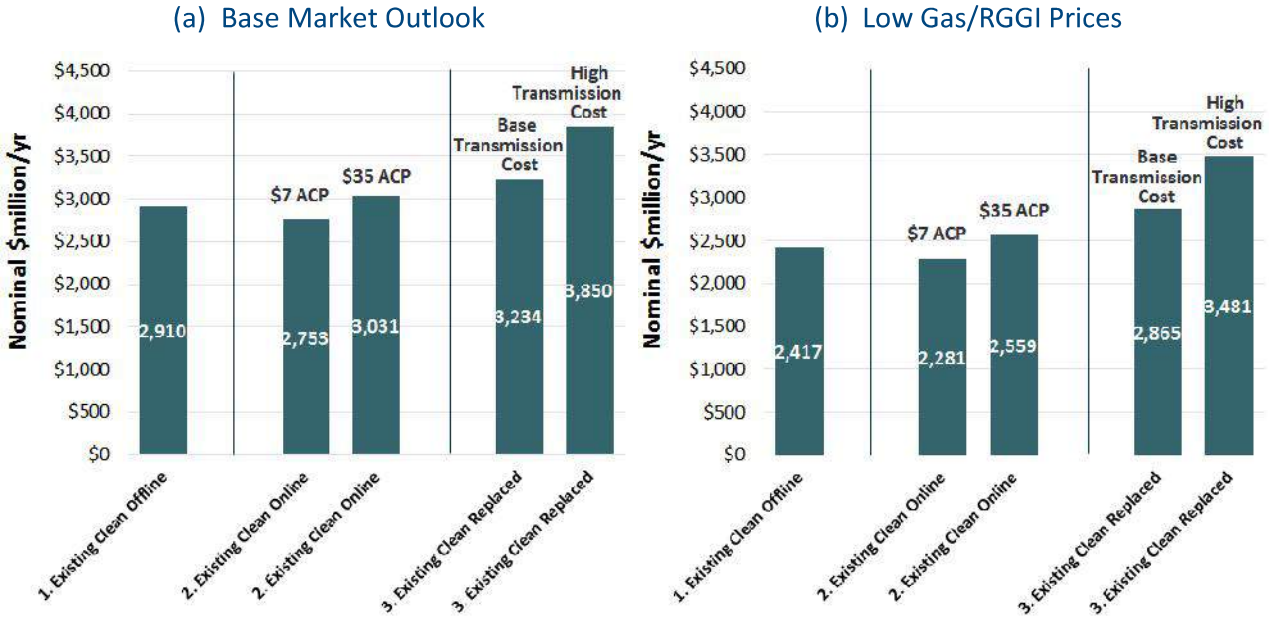
Brattle analysis.

Transmission costs are assumed to be $500/kW under the base case, and $2,000/kW under the high case.

- **Retaining the existing clean generators under the CES-E program would reduce Massachusetts customer costs by $0.2-$1.2 billion per year on average during the period 2017–2030 relative to the Massachusetts' share of cost of replacing the generation output of existing clean generators with 5 GW of additional new renewables.**

The range in customer cost savings reflects the assumed level of ACP for the CES-E program set at either $7/MWh (10% of the Class I ACP) or $35/MWh (50% of the Class I ACP), the assumed prices of natural gas and RGGI GHG allowances in the future, and the uncertainty in the cost of new renewables and associated new transmission investment. The estimated customer cost savings are net of the payments to existing clean generators for about 9 TWh per year of CES-E eligible output. Such payments would be $69 million per year under the $7/MWh ACP and $345 million per year under the $35/MWh ACP.

Figure 4: Massachusetts Customer Costs



Sources and Notes:
Brattle analysis.
Transmission costs are assumed to be $500/kW under the base case and $2,000/kW under the high case.

- **The amount of energy imported from potential CES-E eligible existing clean generators to Massachusetts (approximately 9 TWh per year) is roughly equal to the amount of new clean generation that needs to be added between 2020 and 2030 to meet the CES targets.**

  This means that if CES-E eligible existing clean generation no longer served Massachusetts' load, it could "undo" all of the progress that would be made under the existing CES rules over the 10-year horizon. To stay on track with long-term decarbonization efforts, the state would need to add new resources to replace the *lost* energy from these existing clean generators, which would require approximately doubling the clean energy additions during 2020–2030.

  In addition, building new transmission infrastructure to integrate these incremental renewables would take years to complete, resulting in higher emissions in the near term even if the existing clean generation is eventually replaced by incremental renewables.

II. Proposed CES-E Program

In the Stakeholder Discussion Document, Massachusetts EEA and DEP provided an example for potential expansion of the current CES program, which they called "CES-E".[5] The CES-E program would aim to maintain the amount of electricity imported to Massachusetts from existing clean generators. The CES-E would require electricity sellers in Massachusetts to purchase clean energy certificates ("CEC-Es") from existing clean generators that came online after 1990, do not participate in other clean energy programs, and are located in regions that have been exporting significant quantities of clean generation into Massachusetts. The amount of certificates purchased on an annual basis would be set at levels that are consistent with recent imports into Massachusetts from the existing clean generation. We understand that the potentially eligible generation would need to satisfy the same eligibility conditions with respect to GHG emissions as in the CES program, *i.e.*, net lifecycle GHG emissions 50% below those from the most efficient natural gas generator. The CES-E rules would likely include an alternative compliance payment (ACP) option to demonstrate compliance with the CES-E program, where the ACP price would serve as a cap on CEC-E prices. While the level of ACP prices for the CES-E program are yet to be determined, the Stakeholder Discussion Document suggests that it could be below the ACP for the RPS Class I because operating costs of CES-E eligible existing clean resources would likely be lower than the operating plus capital costs associated with RPS-eligible new clean resources.

In order to determine the potentially eligible generation resources for the CES-E program, we reviewed the Massachusetts GHG inventory data on historical imported energy into Massachusetts from other states in New England and from regions outside New England. As shown in Figure 5, annual energy imported into Massachusetts has increased significantly over time largely due to increased hydro imports from Canada. In 2014, Massachusetts imported about 22 TWh of energy, of which 15 TWh were from Québec and New Hampshire accounting for two-thirds of state's net imports in that year. The remaining 7 TWh of imports came from Rhode Island, New York, Prince Edward Island (PEI), and New Brunswick (NB):

- Came into service between 1990 and 2010;
- Have GHG emission rates of at least 50% below those from the most efficient natural gas generator;

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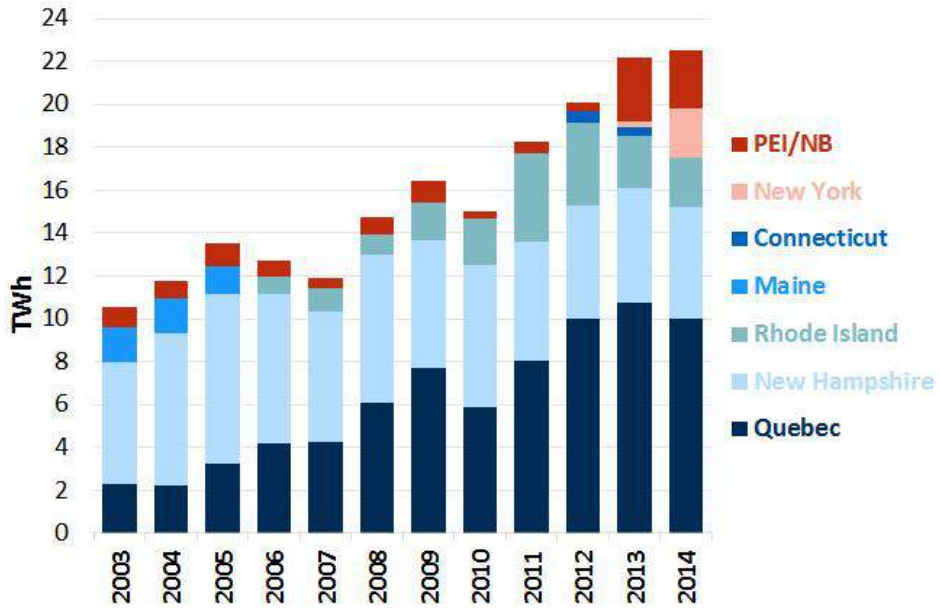
[5] Stakeholder Discussion Document, pp. 4-5.

- Are not remunerated in other clean energy programs (such as state RPS programs); and
- Are located in regions that have been exporting significant quantities of clean generation into Massachusetts, with their portion of deemed imports consistent with the accounting methodology used by Massachusetts GHG inventory.

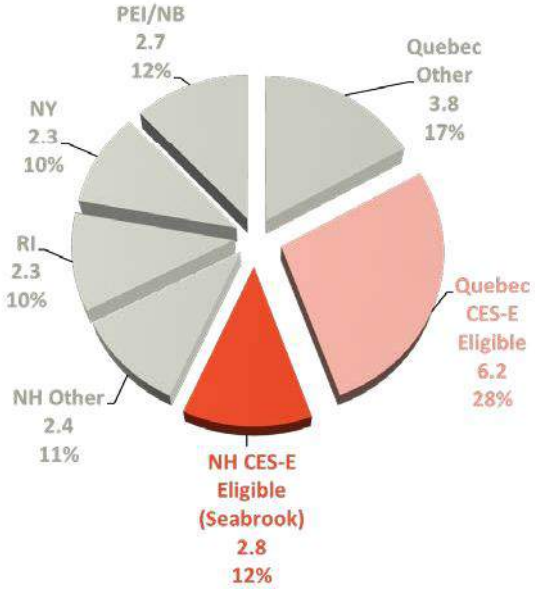
Figure 5: Energy Imports into Massachusetts



Sources and Notes:
Brattle analysis.
Calculated based on data provided in Massachusetts GHG Emissions Inventory.

Accordingly, we estimated that 9 TWh of the energy imported into Massachusetts would be eligible for the CES-E program including: (a) 6.2 TWh from hydro plants in Québec, Canada; and (b) 2.8 TWh from the Seabrook nuclear plant in New Hampshire. As illustrated in Figure 6 below, this corresponds to approximately 40% of the annual imports into Massachusetts based on 2014 levels.

Figure 6: Potential MA CES-E Eligible Resources of Existing Imports (Values Indicate 2014 Import Levels into MA in TWh and % of Total)



For imports from Québec into Massachusetts, we estimated that the portion attributed to resources added during 1990-2010 would be 6.2 TWh by applying Massachusetts' share of New England imports from external markets (~80%) to the increase in New England's imports from Québec between 1990 and 2010 (7.8 TWh).[6] This accounts for 62% of the 10 TWh of Québec imports into Massachusetts, with the remaining 38% attributed to resources that were online prior to 1990 or installed after 2010.

For imports from New Hampshire, we identified Seabrook to be the only existing clean generation that would qualify for the CES-E program, assuming that other clean resources would be already participating in a clean energy program (*e.g.*, state RPS). Historically, Seabrook has generated about 10 TWh/year, which reflects 55% of New Hampshire's total in-state generation. Using the same ratio, we estimated that Seabrook would account for 2.8 TWh of the 5 TWh of energy imports from New Hampshire into Massachusetts.

We assumed that existing clean generation resources other than hydro imports and Seabrook would fail to meet CES-E eligibility criteria as they are likely to participate in other clean energy

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6 Based on Brattle analysis of 1990-2016 electricity import and export data from the National Energy Board of Canada, "Commodity Statistics", posted at: https://apps.neb-one.gc.ca/CommodityStatistics/Statistics.aspx?language=english

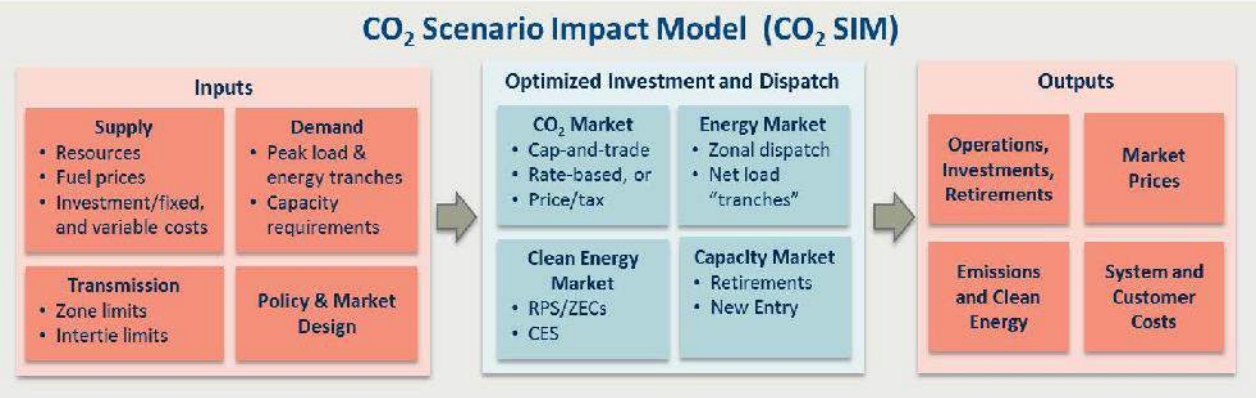
programs, or are located in a state or region from which Massachusetts does not import a significant amount of energy, or came online before 1990.

III. Study Approach and Scenarios

A. Model Description

We analyzed the New England electricity market using Brattle's "CO_2 SIM" expansion planning model to evaluate cost and CO_2 emission impacts of the existing clean generators that could potentially qualify for CES-E. The CO_2 SIM is a least-cost optimization model that simulates generation dispatch and capacity expansion over a modeling horizon of several decades. It minimizes the total production and investment costs over time, subject to meeting the projected energy and capacity requirements by using existing and new resources, and satisfying the state RPS and Massachusetts CES targets. The model groups hours in each year into 50 tranches with similar levels of load and uses a zonal representation of the ISO-New England grid.

The diagram below summarizes the key inputs, outputs, and capabilities of the model:



B. Scenarios

We analyzed the future production costs, customer costs, and CO_2 emissions in Massachusetts and New England under three scenarios:

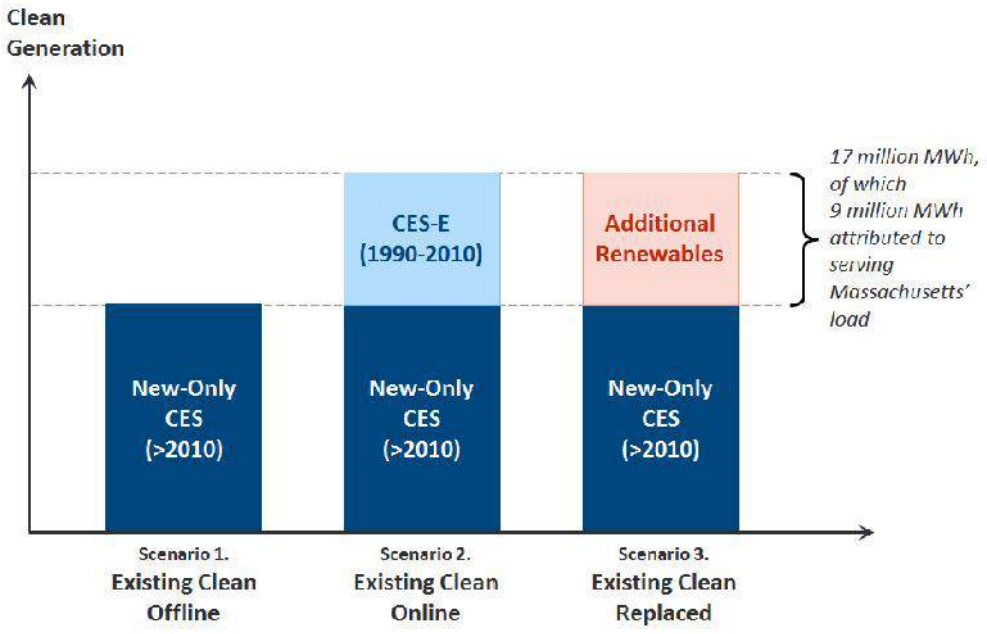
1. Existing Clean Offline (New-Only CES): This scenario reflects the implementation of the current CES program relying on new clean generation placed in service after 2010. The existing clean generation resources that came online between 1990 and 2010 are not eligible to participate in the CES program and they no longer provide their clean energy output to Massachusetts or the rest of the New England system starting in 2017.

2. **Existing Clean Online (Proposed CES-E):** This scenario includes additional requirements for retail electricity suppliers to purchase clean energy certificates (CEC-Es) from eligible existing clean generators that came online after 1990. The annual requirement is set at 9 TWh, based on our estimates of the clean energy imported into Massachusetts from CES-E eligible resources in 2014. The alternative compliance payment (ACP) prices under the CES-E program are assumed to be 10% of RPS Class I ACP, with a sensitivity at 50% of RPS Class I ACP.

3. **Existing Clean Replaced:** As an alternative to expanding the current CES through the CES-E approach in order to retain the contributions of the existing clean generation towards achieving the Massachusetts' GHG reduction goals under GWSA, this scenario assumes *additional* procurement of new renewable generation to replace the output from existing clean generators.

Figure 7 below illustrates the amount of clean generation included across the three scenarios we analyzed in this study. Accordingly, Scenarios 2 and 3 have approximately 17 TWh more clean generation in ISO-NE relative to Scenario 1. Of this, we assumed 9 TWh would serve Massachusetts' load, which reflects the amount of CES-E eligible clean generation we identified consistent with the guidelines in the Stakeholder Discussion Document and Massachusetts GHG accounting methodology.

Figure 7: Illustration of Clean Generation Assumed in Three Scenarios



IV. Key Model Assumptions

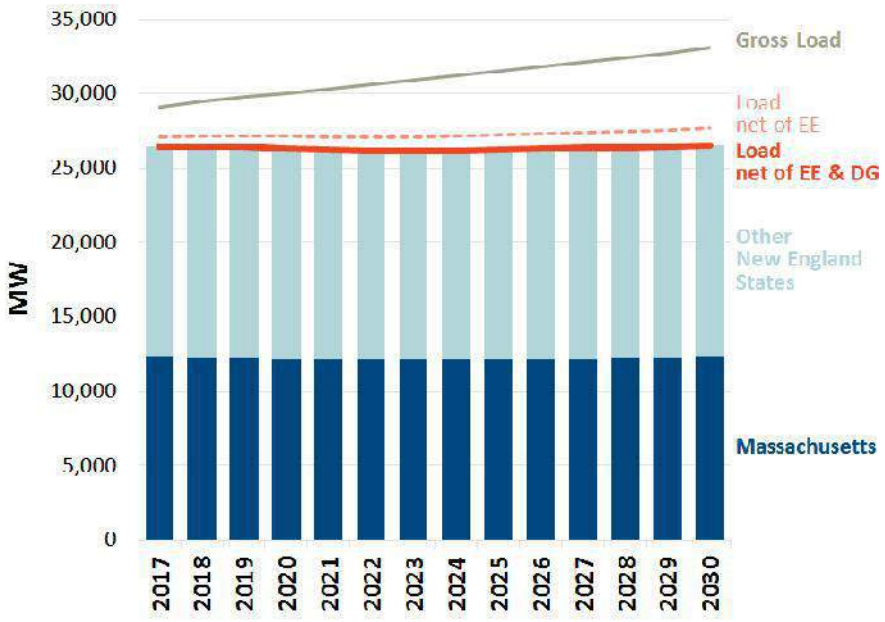
We relied on publicly available data to develop assumptions on market outlook, regional load forecast, clean energy requirements, and operating and capital costs for existing and new generation units.

We describe our key assumptions by category below.

A. Load Forecast

Our outlook on future electricity demand in New England, including demand reductions from energy efficiency and distributed generation, is developed based on ISO-NE's 2017 Forecast Report of Capacity, Energy, Loads, and Transmission (CELT).[7] Figures 8 and 2026 below show the annual peak load and energy projections in ISO-NE region and Massachusetts' share of the regional load.

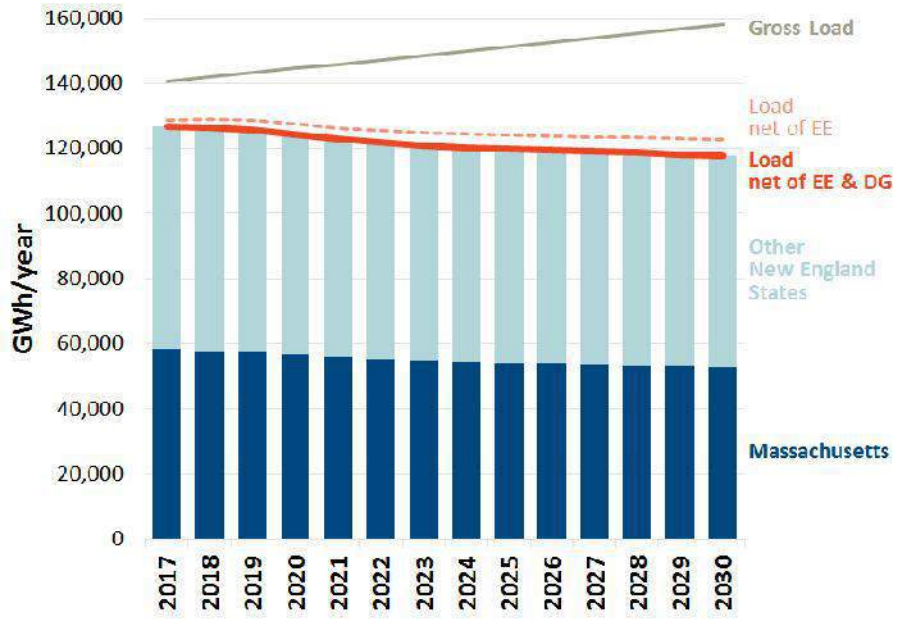
Figure 8: Annual Peak Load



Sources and Notes:
Brattle estimate based on ISO-NE's load forecast in the 2017 CELT report.

[7] ISO-New England, "2017 Forecast Report of Capacity, Energy, Loads, and Transmission (CELT)", May 2017, posted at: https://www.iso-ne.com/system-planning/system-plans-studies/celt

Figure 9: Annual Energy



Sources and Notes:
Brattle estimate based on ISO-NE's load forecast in the 2017 CELT report.

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In our model, we used the load values net of energy efficiency and distributed solar generation (shown in solid red). ISO-NE's load forecast is available through 2026, after which we extrapolated by applying long-term growth rates assuming that energy efficiency savings would continue to increase at the same pace. Accordingly, the region's net peak load and associated capacity requirements remain relatively flat, while annual energy requirements decline slightly over the study horizon.

B. Clean Energy Requirements

We modeled Massachusetts' Clean Energy Standard (CES) as well as Massachusetts and other New England states' Class I renewable portfolio standards (RPS).

Massachusetts' CES sets a target starting at 16% in 2018 and growing 2% annually until it reaches 80% by 2050. As shown in Figure 10, the amount of eligible clean generation needed to satisfy the CES targets would be approximately 10 TWh in 2020 and 18 TWh in 2030.

Figure 10: Clean Generation Needed to Meet Massachusetts' CES Requirements

	2020	2030	2040	2050
CES Target (%)	20%	40%	60%	80%
Net Load Excl. Munis (TWh/yr)	48.9	45.5	45.5	45.5
Clean Generation Need (TWh/yr)	9.8	18.2	27.3	36.4

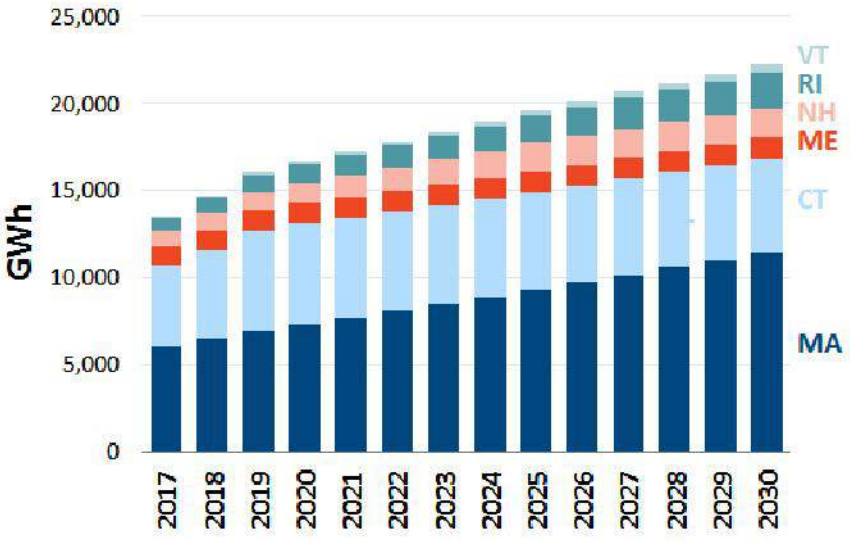
Sources and Notes:

Brattle estimate based on ISO-NE's load forecast (net of EE & DG) in the 2017 CELT report. Load values extrapolated for 2026–2030 based on long-term growth rates and kept it constant after 2030. Excludes municipal load accounting for 14% of state's load.Calculated based on ISO-NE's load forecast (net of EE & DG) in the CELT 2017-2026 report. Load values extrapolated for 2026–2030 based on long-term growth rates and kept it constant after 2030. Excludes municipal load accounting for 14% of state's load.

In addition to the CES, the increasing state RPS targets will also require significant amounts of new clean generation in New England. Within Massachusetts's Class I RPS targets, there is a solar carve-out requiring 1,600 MW of qualified in-state solar by 2020. We do not explicitly model this as a constraint because the total behind-the-meter solar PV assumed in the 2017 CELT load forecast plus planned additions is sufficient to meet the carve-out requirements.

Figure 11 below shows the renewable energy required to meet Class I RPS targets in New England states grow from 13.5 TWh in 2017 up to 22 TWh by 2030. Massachusetts accounts for more than half of the expected growth in regional RPS demand during the 2017–2030 period.

Figure 11: Class I RPS Demand in New England States



Sources and Notes:

Brattle estimate based on New England states' RPS targets and ISO-NE's load forecast (net of EE & DG) in the 2017 CELT report.

Massachusetts electric distribution companies (EDCs), in collaboration with Department of Energy Resources (DOER), issued three Requests for Proposals (RFPs) for long-term contracts to procure clean energy pursuant to Sections 83A, 83C, and 83D of Chapter 169 of the Green Communities Act.[8] The resulting procurements will help the region meet its increasing clean energy requirements, including RPS and CES.

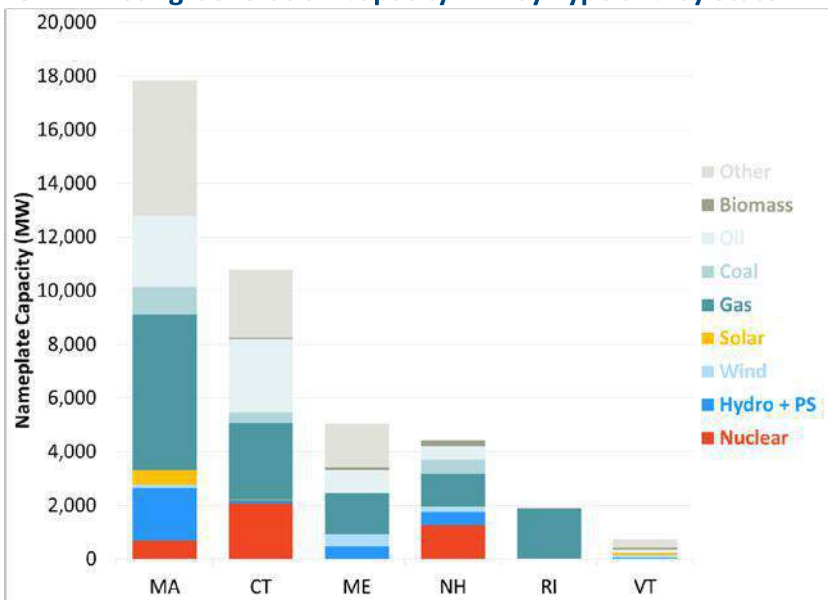
- 83A concluded with the selection of projects in the New England Clean Energy RFP (also known as the Tri-State RFP) with a total capacity of 460 MW that would provide approximately 0.8 TWh/yr of generation annually. In our model, we included each of the selected solar and wind projects as planned builds entering the generation fleet between 2018 and 2020.
- 83C authorizes the procurement of 1,600 MW of offshore wind by 2027 that would provide approximately 6 TWh of generation annually. We assume that this procurement is fully met, starting with 400 MW in 2022, growing by 240 MW each year until reaching the full 1,600 MW in 2027.
- 83D authorizes the procurement of 9,450 GWh of firm clean energy from incremental clean imports or Class I RPS resources by 2022. We assume that this procurement is met through 8,500 GWh (1,100 MW at 90% capacity factor) of incremental hydro imports from Québec and 950 GWh (285 MW at 38% capacity factor) of additional onshore wind resources built in Maine.

C. Supply of Electricity Generation Resources

We model the existing fleet of generating units in ISO-NE using an aggregated unit list based on generator data from ABB Velocity Suite, and benchmarked the capacity by unit type against ISO-NE's public generation capacity data from 2016. Figure 12 below shows the capacity of the existing unit list separated by state and by resource type.

[8] Sections 83A, 83C, and 83D were promulgated through Department of Public Utilities regulations 220 C.M.R. 21.00, 220 C.M.R. 23.00, and 220 C.M.R. 24.00, respectively. Posted at: https://www.mass.gov/service-details/laws-governing-long-term-contracts-for-renewable-energy.

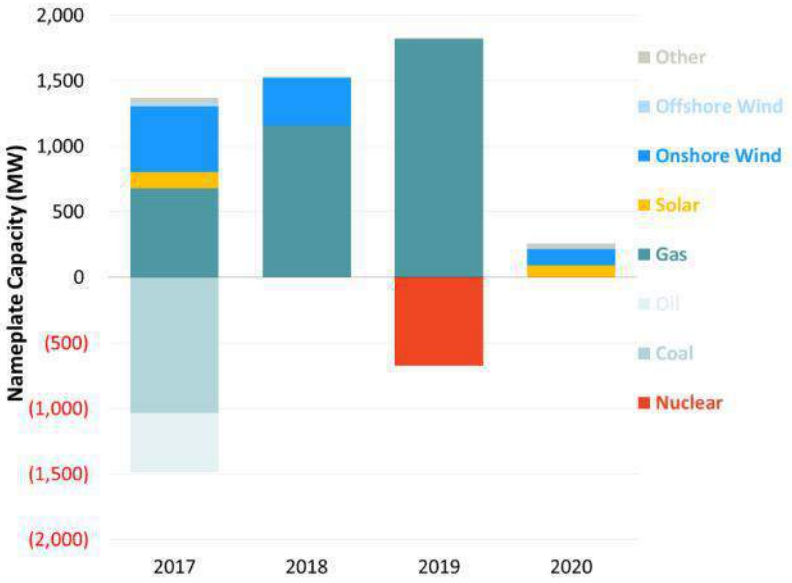
Figure 12: Existing Generation Capacity Mix by Type and by State in 2016



After 2016, the existing unit list is modified to capture planned additions and retirements announced as of May 2017. This includes planned unit additions and retirements assumed in ISO-NE's CONE and ORTP Updates filing and selected projects from the recent New England (Tri-State) RFP.[9] A summary of these planned additions and retirements is shown in Figure 13.

[9] ISO-NE, "Filing of CONE and ORTP Updates", January 13, 2017, posted at: https://www.iso-ne.com/static-assets/documents/2017/01/cone_and_ortp_updates.pdf, and New England Clean Energy RFP, posted at: https://cleanenergyrfp.com/

Figure 13: Planned Additions and Retirements by Type



In addition to existing units and planned additions and retirements, we model the Massachusetts 83C and 83D procurements as described in Section IV.B. Lastly, the model can choose to build new gas, renewable, and demand response resources, and retire existing fossil plants if they become uneconomic. The capital and going-forward cost assumptions for builds and retirements are described in the following section.

D. PLANT AND TRANSMISSION COST ASSUMPTIONS

Existing Plant Going-Forward Costs

Our model allows for economic retirements based on existing plants' going-forward costs relative to plants' market revenues. Figure 14 below summarizes our assumptions of the fixed costs (FOM + CapEx) for existing fossil plants. We adopted the cost values from EPA's IPM model and assumed that they increase over time with plant age.[10]

[10] U.S. Environmental Protection Agency, "Documentation for EPA Base Case v.5.13 Using the Integrated Planning Model", November 2013, posted at: https://www.epa.gov/sites/production/files/2015-07/documents/documentation_for_epa_base_case_v.5.13_using_the_integrated_planning_model.pdf

Figure 14: Fixed Going-Forward Costs of Existing Fossil Plants
(FOM + CapEx in 2017 $/kW-yr)

Plant Age	Gas/Oil ST	Coal ST
30	$23	$53
40	$39	$67
50	$65	$85
60	$109	$109

We assumed fixed going-forward costs of the Seabrook nuclear plant based on publicly available estimates, from EPA's IPM modeling assumptions for FOM and EIA's AEO2017 assumptions for ongoing CapEx. Accordingly, the total fixed costs of Seabrook would be around $250/kW-yr in 2017, increasing over time with inflation and by age. We assume that Seabrook's license extension application, currently under review by the Nuclear Regulatory Commission, will be approved and would extend the unit's operating license from 2030 to 2050.

We have not explicitly considered the fixed costs of other nuclear plants (Millstone and Pilgrim) as they are assumed to operate until current license expiration or announced retirement across all of our scenarios.

New Plant Costs

Our model considers cost of new entry for gas-fired CC and CTs, demand response, and renewables to determine the least-cost solution for meeting the region's energy, capacity, and clean generation needs.

Figure 15 summarizes our assumptions for the new gas-fired plants developed based on the ORTP values and plant parameters used in ISO-NE's CONE and ORTP Updates filing in January 2017.[11]

[11] ISO-NE, "Filing of CONE and ORTP Updates", January 13, 2017, posted at: https://www.iso-ne.com/static-assets/documents/2017/01/cone_and_ortp_updates.pdf

Figure 15: Performance and Cost Characteristics of New Gas-Fired Plants

		Gas CC	Gas CT
Capacity	*(ICAP MW)*	491	338
w/ Duct firing		533	
Heat Rate	*(Btu/kWh)*	6,381	9,220
w/ Duct firing		6,546	
Levelized CapEx + FOM	*($2017/kW-yr)*	$149	$109
VOM	*($2017/MWh)*	$3.2	$4.2

For new demand response, we constructed three tiers assuming that the unit costs would go up based on DR penetration as a share of system's peak load. Figure 16 summarizes our assumptions for each of these tiers with the lowest costs for up to 12% penetration and increased costs at higher DR penetration levels.

Figure 16: Cost Assumptions for New Demand Response

		Inexpensive	Middle	Expensive
Percent of Peak Load	*(%)*	0-12%	12-16%	16-24%
Levelized CapEx + FOM	*($2017/kW-yr)*	$37	$92	$135
VOM	*($2017/MWh)*	$1,000	$2,000	$3,000

For new renewables, we relied on a combination of ISO-NE's CONE and ORTP Updates filing and the NESCOE/London Economics study to develop all-in costs and used NREL data to determine capacity factors at the state level.[12] Figure 17 summarizes our assumptions for wind and solar resources.

[12] NREL's System Advisor Model was used to generate hourly profiles and capacity factors for solar resources, and NREL's Wind Prospector Tool was used to generate profiles for wind resources. For onshore wind, we used the all-in cost from the ORTP study as the initial cost estimate, and interpolated to meet the 2025 and 2030 cost estimates from the NESCOE study. For offshore wind and solar, we used the 2025 and 2030 cost estimates from the NESCOE study, and applied the same cost decline trend to years prior to 2025. See New England States Committee on Electricity (NESCOE)/London Economics International (LEI), "Renewable and Clean Energy Scenario Analysis and Mechanisms 2.0 Study, Phase I, Scenario Analysis Report", March 2017, posted at: http://nescoe.com/resource-center/mechanisms-scenario-analysis-mar2017.

Figure 17: All-in Cost and Capacity Factors for New Renewables

	Onshore Wind	Offshore Wind	Utility Solar
All-in Costs			
(2017$/kW-yr)			
2020	$309	$696	$200
2025	$240	$616	$168
2030	$221	$545	$141
Capacity Factor			
CT	34%		15%
MA	34%	42%	16%
ME	38%	40%	14%
NH	32%		16%
RI	31%	42%	15%
VT	34%		15%

The costs in Figure 17 do not reflect any reductions from tax credits. In our model, we incorporated the federal tax credits (PTC and ITC) and their expected phase-out over the next several years. Accordingly, we assumed that PTC would be available for wind resources commencing construction prior to 2020, with credits declining to $19/MWh in 2017, $14/MWh in 2018, and $9/MWh in 2019. We also assumed that ITC would be available for solar resources at 30% until 2019, 26% in 2020, 22% in 2021, and 10% after 2022.

Incremental Transmission Costs

Expansion of renewable generation needed to meet Massachusetts and other New England states' clean energy goals would likely require substantial amounts of investments in new transmission to be able to access low-cost resources and address increased congestion at higher renewable penetration levels.

While the level of transmission investment need is highly uncertain and it would depend on the amount, type, and locations of renewables added, as well as other market drivers, various recent industry studies suggest that the costs could be significant especially for the best, more remote sites. For example, ISO-NE recently analyzed the transmission costs to integrate wind resources in Maine and estimated that it would require $1.3 billion for 1,118 MW of wind in northern

Maine and $575 million for 777 MW of wind in western Maine.[13] These cost estimates translate to $750–$1,150 per kW-wind. A separate ISO-NE study focusing on high-level costs of transmission development to facilitate renewables in New England found that adding 2,955 MW of wind in Maine to meet region's RPS goals would require $5.2–$6.7 billion of investments in transmission ($7.8–$10 billion including 50% contingency) which translates to $1,700–$3,300 per kW-wind.[14] The same study found that adding approximately 10,000 MW in addition to amount needed to meet RPS would require $15–$20 billion of investments in transmission incrementally, which corresponds to $1,500–$2,000 per kW-wind.

In our study, we consider only transmission costs for the incremental wind resources added in Scenario 3 since the other transmission costs would be common across all three scenarios. In our base outlook, we conservatively assumed transmission costs to be $500/kW-wind. Accordingly, we estimated that levelized cost of transmission needed to integrate the 5,300 MW of wind added in Scenario 3 to replace existing clean generation would be $350 million/yr (in 2017$) assuming a 13% charge rate. We allocated about half of these costs to Massachusetts based on the share of CES-E eligible portion of the existing clean generation that gets replaced (9 TWh out of 17 TWh).

Recognizing the highly uncertain nature in future transmission needs and costs, we also tested a sensitivity in which we used $2,000/kW-wind consistent with the higher end of the cost range estimated in the recent ISO-NE wind integration studies. This translates to a levelized cost of $1.4 billion/yr (in 2017$) for the 5,300 MW added in Scenario 3, of which $0.7 billion/yr is allocated to Massachusetts based on the share of CES-E eligible portion of the existing clean generation replaced.

E. Fuel Prices

Fuel cost is a major component of the variable cost of generation and a key driver of market outcome in Massachusetts and the rest of the ISO-NE region. Although electric generators rely on a variety of fuels, ISO-NE's system relies most heavily on natural gas-fired plants. Electricity

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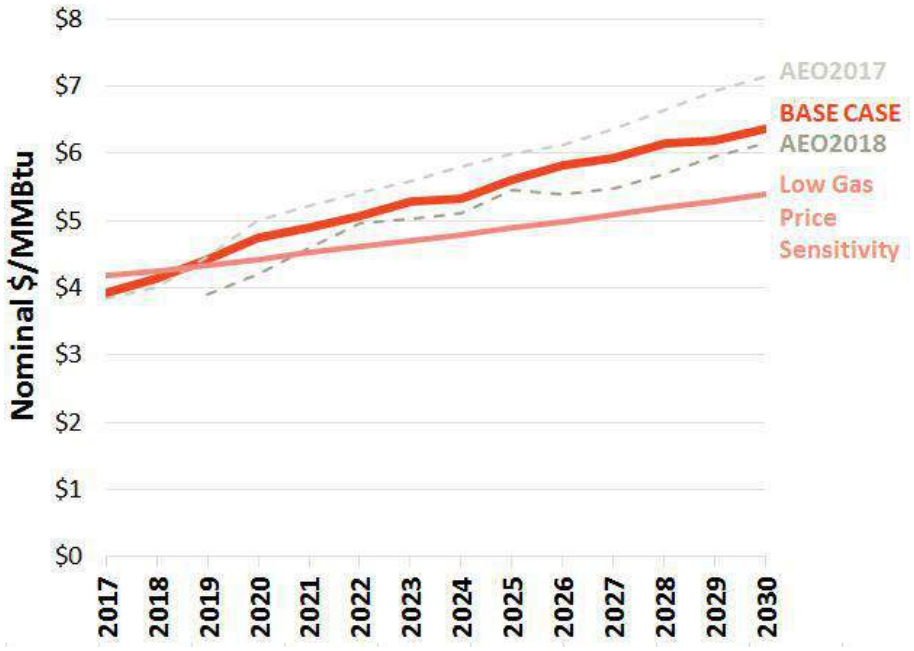
13 ISO-NE, "2016/17 Maine Resource Integration Study–Scenarios and Cost Estimates," Planning Advisory Committee, August 3, 2017.

14 ISO-NE, "2016 Economic Study: NEPOOL Scenario Analysis–Implications of Public Policies on ISO New England Market Design, System Reliability and Operability, Resource Costs and Revenues, and Emissions", July 24, 2017

prices are therefore highly sensitive to variation in natural gas prices. Although the region has substantial amounts of oil-fired generation (including plants with dual-fuel capability), these plants often run very little and they are kept primarily as capacity resources towards meeting reserve margin targets.

Figure 18 below shows our natural gas prices assumptions, compared to EIA's projections in AEO2017 and AEO2018 (Early Release). For our base outlook, we relied on inputs developed for NESCOE/London Economics International's Renewable and Clean Energy Scenario Analysis and Mechanisms 2.0 Study.[15] Annual average gas prices in New England start at around $4/MMBtu in 2017 and rise over time to $4.7/MMBtu in 2020 and $6.3/MMBtu in 2030. In our Low Gas/RGGI Price sensitivity, we assumed that gas prices would grow more slowly (based on 2% inflation) reaching $4.4/MMBtu in 2020 and $5.4/MMBtu in 2030.

Figure 18: Annual Average Natural Gas Prices in New England



Sources and Notes:

Brattle analysis comparing gas prices from the NESCOE/LEI study (used for base case and adjusted for the sensitivity) against prices from EIA's AEO 2017 and preliminary AEO 2018.

[15] New England States Committee on Electricity (NESCOE)/London Economics International (LEI), "Renewable and Clean Energy Scenario Analysis and Mechanisms 2.0 Study, Phase I, Scenario Analysis Report", March 2017, posted at: http://nescoe.com/resource-center/mechanisms-scenario-analysis-mar2017.

For other fuels, we used the inputs developed for the same NESCOE/London Economics study. Accordingly, we assumed coal prices to start at $3.5/MMBtu in 2017 and rise steadily to $5.5/MMBtu by 2030, and fuel oil prices to start at $10.1/MMBtu in 2017 and grow over time reaching $18.6/MMBtu by 2030.

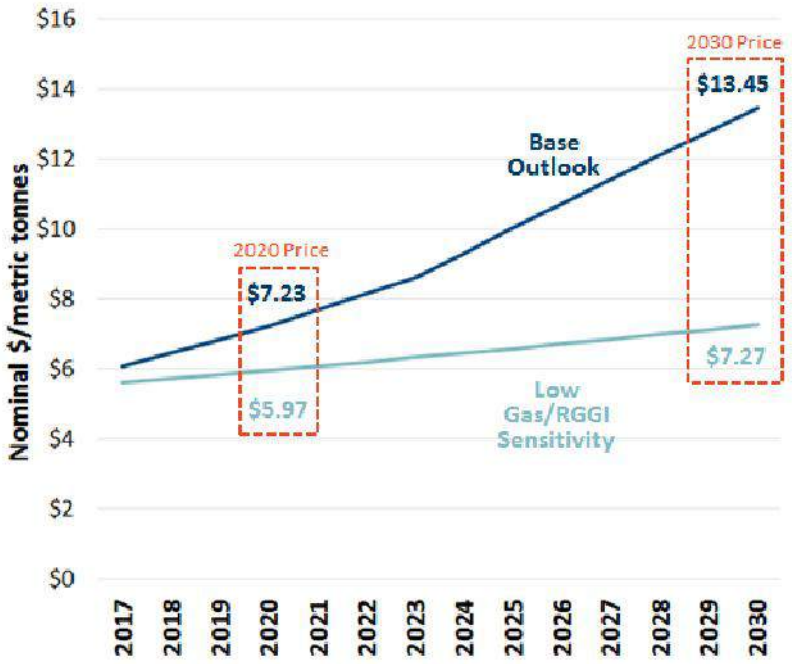
F. RGGI GHG Allowance Prices

In our base outlook, we used the RGGI GHG prices from a recent ICF study, increasing from about $6/metric tonnes in 2017 up to $7.2/metric tonnes in 2020 and $13.4/metric tonnes in 2030 (nominal $).[16] This price projection reflects the recent program changes, including an additional 30% decline in emissions cap by 2030. Under our low gas/RGGI price sensitivity, we assumed that the RGGI GHG prices would remain constant at $5.6/metric tonnes in 2017$, which translates to $6/metric tonnes in 2020 and $7.3/metric tonnes in 2030 (nominal $).

Figure 19 below shows our assumed GHG prices over the 2017–2030 period:

[16] ICF International, "Draft 2017 Model Rule Policy Scenario Overview", September 2017, posted at: https://rggi.org/docs/ProgramReview/2017/09-25-17/Draft_IPM_Model_Rule_Results_Overview_09_25_17.pdf

Figure 19: RGGI GHG Allowance Prices



Sources and Notes:

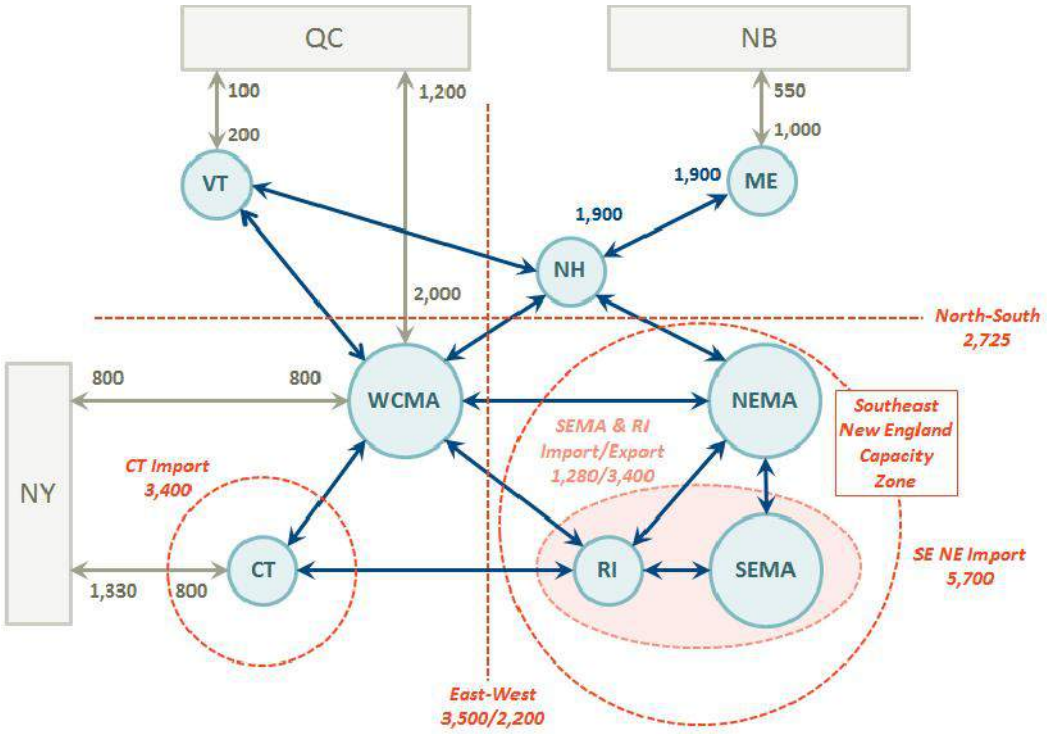
Projections under base outlook based on RGGI GHG prices from the 2017 ICF study. Low price sensitivity assumes RGGI GHG prices would remain at $5.6/metric tonnes in 2017$.

G. TRANSMISSION

CO_2 SIM is a zonal pipes-and-bubble model as illustrated in Figure 20 below. The transmission limits are adopted from the 2016 ISO-NE economic study.[17] Imports from external markets are modeled as fixed schedules subject to transfer limits (*e.g.*, 800 MW between WCMA and NY). Internal transfers between zones are constrained by limits on individual interties (*e.g.*, 1,900 MW between ME and NH) as well as limits applied on various interfaces shown in dashed lines and bubbles (*e.g.*, 2,725 MW North-South).

[17] ISO-NE, "Transmission Transfer Capabilities & Capacity Zone Development", March 2016, posted at: https://www.iso-ne.com/markets-operations/markets/forward-capacity-market/fcm-participation-guide/capacity-zone-development

Figure 20: Summary of Transmission Assumptions



Sources and Notes:
Adapted from 2016 ISO-NE Economic Study.

In addition to the transfer limits shown above, we included additional transmission capability to between ME and WCMA zones to accommodate the substantial new wind development in northern ME. We set this incremental transfer capability to 2,400 MW under Scenarios 1 and 2 based on inputs from the NESCOE/London Economics study and further increased to 7,400 MW under Scenario 3 due to the additional wind resources included in this scenario to replace existing clean generation.

V. Study Results under Base Market Outlook

The value of existing clean generation in New England can be evaluated in two ways: 1) the additional GHG emissions that would occur if these resources were offline, or 2) the incremental costs of meeting Massachusetts and New England decarbonization goals without the benefit of these resources. We quantify both types of impacts in our study. Without existing clean resources, Massachusetts GHG emissions would increase by 3–3.5 million tonnes per year on average between 2017 and 2020 and New England emissions would increase by about 7 million tonnes per year, assuming the generation from these facilities *was not* replaced by new clean resources. If the output of existing resources *was* replaced with new renewables, Massachusetts-

wide customer costs would increase by $200–$480 million per year, depending on the assumed price of CEC-E credits. Total resource costs in New England would increase by approximately $1.1 billion per year under our base case estimate of the costs of developing new clean resources and the transmission necessary to deliver it to New England load.

Differences in CO_2 emissions and costs across our three scenarios are driven by differences in the generation fleet and in the mix of resources meeting load. Figure 21 shows the composition of the generation fleet in 2020 and 2030 under each scenario. Comparing the Existing Clean Online to the Existing Clean Offline scenario, there are several key differences. Seabrook's 1,250 MW are online in both 2020 and 2030. The presence of Seabrook allows some oil-fired capacity to retire early in 2020. Additionally, the impact of Seabrook on both capacity and energy prices results in less gas capacity in both 2020 and 2030. The reductions in gas and oil capacity entirely offset Seabrook's additional capacity, ensuring that capacity market requirements are achieved but not exceeded.

Comparing the Existing Clean Online to the Existing Clean Replaced scenario, the most significant differences are in nuclear and onshore wind capacity. As we discussed in Section III, 5,300 MW of onshore wind (1,583 MW on a de-rated basis for meeting resource adequacy needs) was added in the Existing Clean Replaced scenario to replace the clean energy from Seabrook and the portion of existing hydro imports that would be eligible for CES-E. The Existing Clean Online scenario also has somewhat more oil, gas, and DR capacity compared to the Existing Clean Replaced scenario (though it has less than the Existing Clean Offline scenario), making up for the difference in the capacity value of the 5,300 MW of wind and the capacity value of Seabrook.

Figure 21: ISO-NE Generation Capacity De-Rated Based on Availability

	2020					2030				
	[1] Existing Clean Offline (New-Only CES)	[2] Existing Clean Online (Proposed CES-E)	[3] Existing Clean Replaced	[2]-[1] Delta	[2]-[3] Delta	[1] Existing Clean Offline (New-Only CES)	[2] Existing Clean Online (Proposed CES-E)	[3] Existing Clean Replaced	[2]-[1] Delta	[2]-[3] Delta
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)
Gas	17,703	16,954	16,935	(749)	19	18,916	17,667	17,333	(1,249)	334
Coal	383	383	383	0	0	0	0	0	0	0
Oil	4,047	3,548	3,328	(500)	220	1,829	1,829	1,829	0	0
Nuclear	2,082	3,331	2,082	1,249	1,249	2,082	3,331	2,082	1,249	1,249
Hydro + PS	3,130	3,130	3,130	0	0	3,151	3,151	3,151	0	0
Onshore Wind	798	798	2,381	0	(1,583)	884	884	2,467	0	(1,583)
Offshore Wind	9	9	9	0	0	489	489	489	0	0
Utility Solar	137	137	137	0	0	137	137	137	0	0
Other Renewables	975	975	975	0	0	997	997	997	0	0
Net Imports	1,235	1,235	1,235	0	0	2,311	2,311	2,311	0	0
DR	3,157	3,157	3,061	0	95	3,157	3,157	3,157	0	0
Total	**33,657**	**33,657**	**33,657**	**(0)**	**(0)**	**33,952**	**33,952**	**33,952**	**0**	**0**

Sources and Notes: Brattle analysis. Reflects capacity values qualified for meeting resource adequacy needs.

Figure 22 shows changes in annual generation across the three scenarios. The additional nuclear generation in the Existing Clean Online scenario is entirely driven by the additional 1,249 MW of Seabrook capacity. Net imports are also higher in the Existing Clean Online scenario, as hydro imports from existing resources are fully available. Gas generation is lower under the Existing Clean Online scenario, reflecting both the reduced gas capacity shown in Figure 21 and the impact of lower energy prices on the utilization of remaining gas capacity. Similarly, oil generation decreases in the Existing Clean Online case relative to both the other cases, reflecting the impact of lower energy prices. In the Existing Clean Replaced case, additional onshore wind generation is sufficient to make up for the generation of Seabrook and eligible hydro imports.

Figure 22: ISO-NE Annual Generation

	2020					2030				
	[1] Existing Clean Offline (New-Only CES)	[2] Existing Clean Online (Proposed CES-E)	[3] Existing Clean Replaced	[2]-[1] Delta	[2]-[3] Delta	[1] Existing Clean Offline (New-Only CES)	[2] Existing Clean Online (Proposed CES-E)	[3] Existing Clean Replaced	[2]-[1] Delta	[2]-[3] Delta
	(GWh)	(GWh)	(GWh)	(GWh)	(GWh)	(GWh)	(GWh)	(GWh)	(GWh)	(GWh)
Gas	69,854	52,188	52,832	(17,666)	(644)	47,918	30,772	31,561	(17,145)	(788)
Coal	414	379	402	(36)	(23)	0	0	0	0	0
Oil	96	10	88	(86)	(78)	3	0	15	(3)	(15)
Nuclear	16,448	26,318	16,448	9,870	9,870	16,448	26,318	16,356	9,870	9,961
Hydro + PS	7,374	7,374	7,374	0	0	7,510	7,510	7,510	0	0
Onshore Wind	8,513	8,513	25,982	0	(17,469)	9,457	9,457	26,926	0	(17,469)
Offshore Wind	111	111	111	0	0	6,032	6,032	6,032	0	0
Utility Solar	1,182	1,182	1,182	0	0	1,182	1,182	1,182	0	0
Other Renewables	8,308	8,308	8,308	0	0	8,489	8,145	8,169	(344)	(24)
Net Imports	12,913	20,738	12,913	7,826	7,826	21,419	29,245	21,419	7,826	7,826
DR	0	0	1	0	(1)	0	0	0	0	(0)
Total	**125,213**	**125,120**	**125,640**	**(92)**	**(520)**	**118,458**	**118,662**	**119,171**	**204**	**(509)**

Sources and Notes: Brattle analysis. Total amount of generation varies slightly across scenarios due to differences in losses.

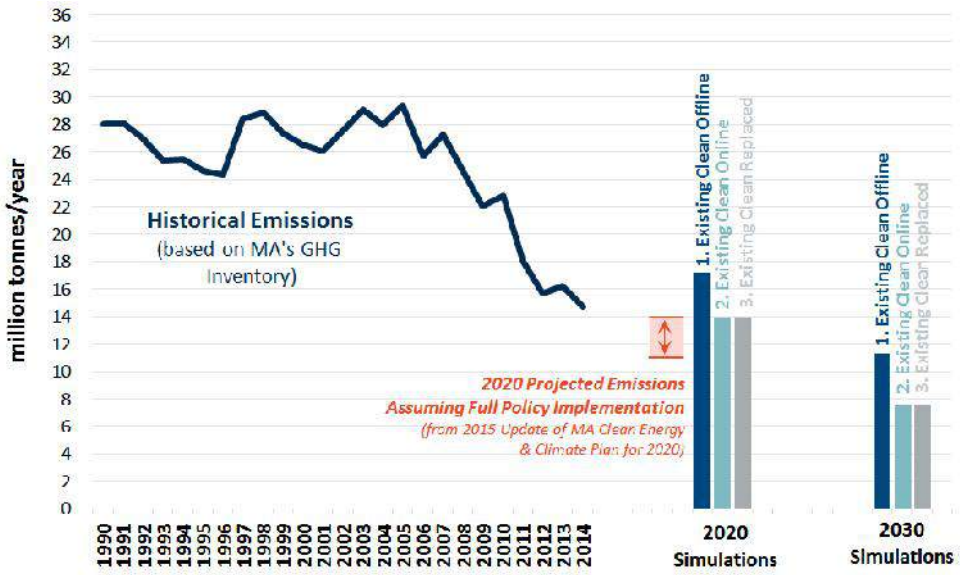
A. ENVIRONMENTAL IMPACTS

CES-E eligible resources contribute substantial quantities of clean energy generation to Massachusetts and New England. Seabrook is responsible for nearly 10 TWh per year of zero carbon generation and Canadian hydro imports add an additional 14 TWh. A portion of this clean energy is used to serve Massachusetts load. Approximately 2.8 TWh of Seabrook's annual generation is deemed to serve Massachusetts load under the GHG inventory methodology adopted by Massachusetts, and would be eligible for CES-E. About 6.2 TWh of Canadian hydro imports serve Massachusetts load are incremental to 1990, and are not eligible for CES, and would likely be eligible for CES-E.

Massachusetts CO_2 emissions would be substantially higher in the absence of these existing clean resources. Accounting for both emissions from in-state generation and imports of fossil energy from out of state, Massachusetts CO_2 emissions would be 3–3.5 million tonnes per year higher in the absence of CES-E resources. Figure 23 shows Massachusetts electric sector emissions in 2020 and 2030 across the three cases we evaluated in our modeling, compared with historical emissions. In 2020, emissions with Existing Clean Offline would likely be approximately 17 million tonnes per year, 3 million tonnes per year higher than the other two scenarios, and well above the levels projected in the Massachusetts Clean Energy & Climate Plan. By 2030, emissions with Existing Clean Offline are expected to fall to 11 million tonnes per year due to a combination of RPS, CES, and renewable procurements. However, emissions in this case would still be approximately 3 million tonnes per year higher than with Existing Clean Online.[18]

[18] Our analysis considered the impact of the Massachusetts electricity sector CO_2 emission limit under 310 CMR 7.74. We found that this limit is not binding in any of the three cases we considered. This finding is consistent with Synapse Energy Economics' August 2017 study. Since the electric sector emissions cap is not binding, removing existing clean generation without replacing it will indeed increase emissions. See Pat Knight *et al.*, "Analysis of Massachusetts Electricity Sector Regulations: Electricity Bill and CO_2 Emissions Impacts," August 2017, posted at: http://www.mass.gov/eea/docs/dep/air/climate/3dapp-study.pdf

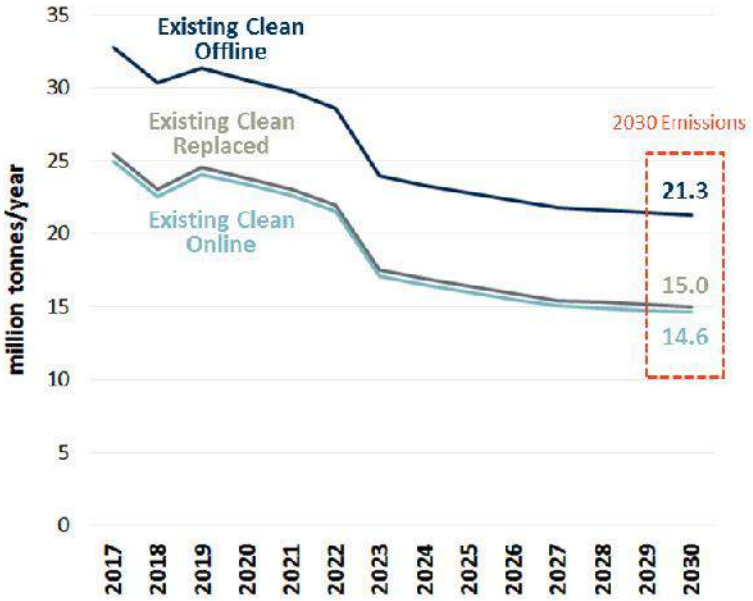
Figure 23: CO_2 Emissions to Serve MA's Electric Load



Sources and Notes:
Brattle analysis.
Calculated based on model outputs and historical data provided in Massachusetts GHG Emissions Inventory.

Existing clean resources have additional GHG benefits across New England. While locking-in Massachusetts' emissions reductions achievements is the primary objective of the CES-E policy, the New England-wide GHG reduction benefits are approximately twice as large as the Massachusetts-only benefits. As we illustrate in Figure 24, New England-wide CO_2 emissions would be 6–7 million tonnes per year higher in the Existing Clean Offline case relative to the Existing Clean Online case. As shown in the figure, these emission reductions are approximately constant through 2030, even as total system emissions decline.

Figure 24: ISO-NE System-Wide CO_2 Emissions



In the case without the existing clean resources, new renewables could be brought online in order to replace their clean energy and achieve Massachusetts' decarbonization goals.[19] Massachusetts could replace this generation with new clean resources, keeping the state on target to achieve its decarbonization goals. To illustrate the impact of this replacement, we modeled an additional Existing Clean Replaced scenario, in which the generation from Seabrook and Canadian hydro imports are replaced by new onshore wind. Figure 23 and Figure 24 show that this strategy could achieve approximately the same level of GHG emissions in Massachusetts and New England as the Existing Clean Online case. However, this scenario would result in additional costs as described in section V.B below.

B. Economic and Customer Cost Savings

Existing clean resources provide low-cost generation to serve load in Massachusetts and across New England. Without this generation, Massachusetts and other New England states would have to procure additional clean energy from new resources to meet their decarbonization goals.

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[19] Our modeling results show approximately equal levels of emissions under the Existing Clean Replaced and Existing Clean Online scenarios across all years assuming that the output from existing clean generators are immediately replaced. However, it might be practically difficult to replace the clean energy from Seabrook and Canadian hydro before 2020, as it would take many years to plan for and develop renewables and associated transmission. Thus, in the absence of the existing clean resources, Massachusetts would not likely reach its 2020 emissions goal.

We quantify the cost impacts of this additional requirement in two ways. The first is the impact on total system costs in ISO-NE, which includes production costs, fixed costs, investment costs, and import costs as discussed below. The second is the impact on customer costs in Massachusetts, which reflect market prices of energy and capacity as well as the state's clean energy procurement costs. We estimate these cost impacts by comparing the Existing Clean Online and Existing Clean Replaced cases.[20]

We evaluated the total cost of producing electricity in New England in four components:

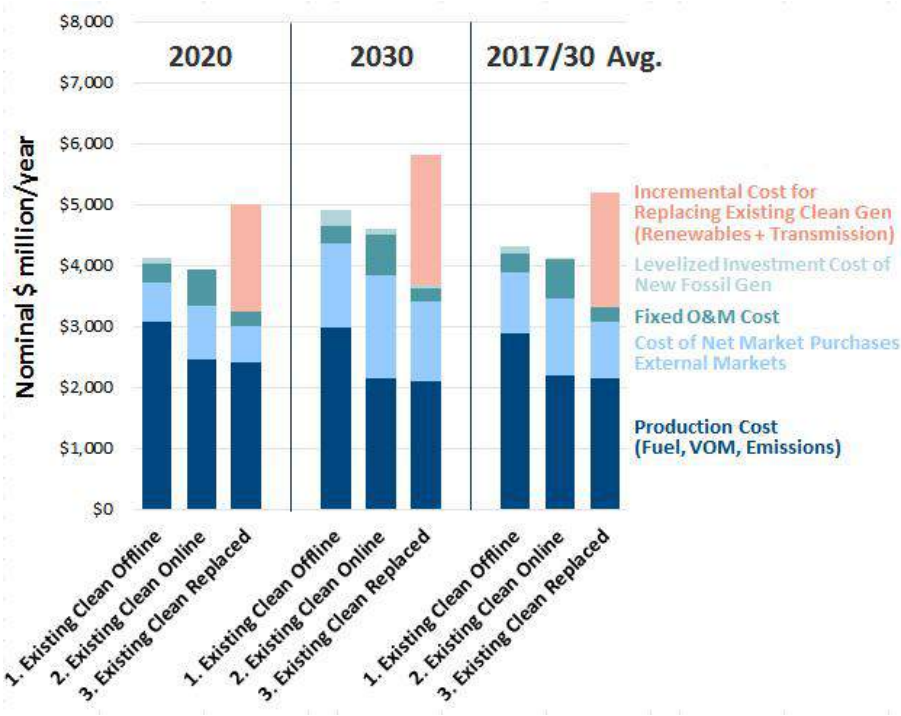
- **Production Costs** reflect the cost of fuel, variable operations and maintenance expenses, and the costs of RGGI allowances for New England generators;
- **Cost of Net Market Purchases from External Markets** reflect the cost of importing power from neighboring regions, valued at market prices for energy and capacity.
- **Fixed Operations and Maintenance (O&M) Costs** reflect the fixed going-forward costs of certain existing units in New England. We report fixed O&M costs only for nuclear and fossil plants that might economically retire. Fixed operations and maintenance costs for new resources are included as a part of the levelized investment costs and incremental cost for replacing the existing clean generation.
- **Levelized Investment Costs of New Fossil Generation** reflect capital and financing costs of developing new fossil resources, levelized over the lifetime of the asset. We report investment costs only for new fossil plants built after 2017 and do not report any of the sunk costs for the existing generating fleet.
- **Incremental Cost for Replacing Existing Clean Generation (Renewables and Transmission)** reflects the cost of replacing the clean generation in the Existing Clean Replaced scenario. These costs include levelized investment costs and annual operating costs for new onshore wind facilities, and the cost of incremental transmission needed to deliver their output to Massachusetts load.

As Figure 25 shows, the total ISO-NE system cost of replacing existing clean generation with new renewables is higher by approximately $1.1 billion per year. These costs correspond to the

[20] Note that the cost savings and emissions savings of existing clean resources cannot both be achieved together. If states choose to replace energy from existing clean resources with new clean generation, the existing clean resources drive cost savings. If states do not replace this energy, the existing clean resources drive emissions savings.

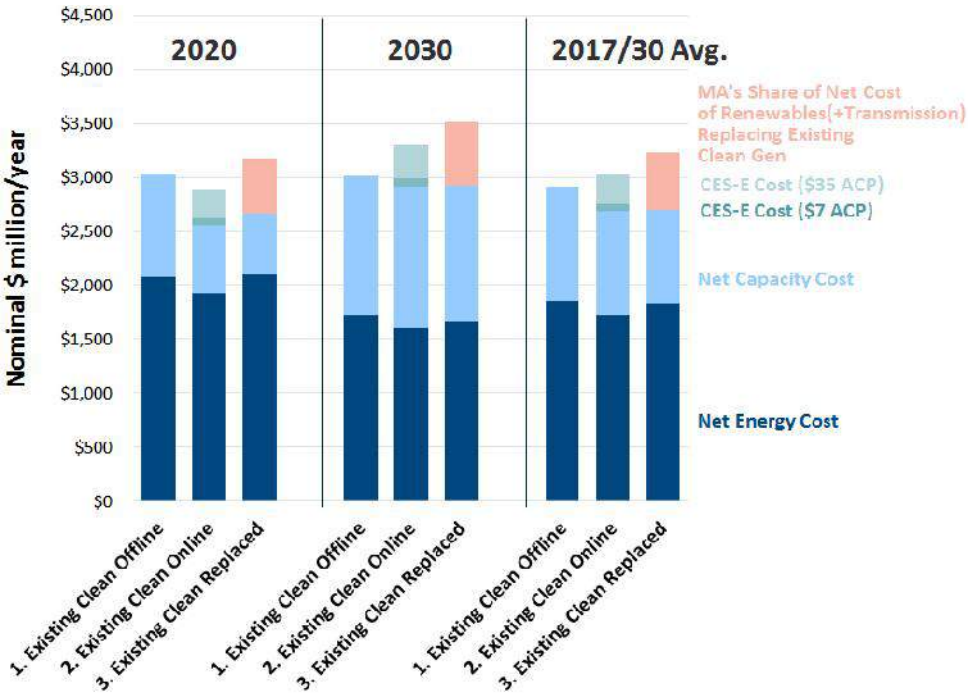
difference between total costs under the Existing Clean Replaced and the Existing Clean Online scenarios. The largest component of these additional costs is the incremental investment cost in new renewables. The size of these investment costs is sensitive to the cost of developing wind resources and the incremental transmission needed to reach them, as discussed in Section III. The incremental investment costs are offset by the higher fixed operations and maintenance costs under the Existing Clean Online case.

Figure 25: ISO-NE Total Annual System Costs



Replacing existing clean resources also increases costs to Massachusetts customers, as shown in Figure 26. Although Massachusetts customers would only pay for the portion of incremental renewables serving Massachusetts load, these renewables are the primary driver of customer costs. The additional renewables costs are offset by CES-E payments to existing clean resources under the Existing Clean Online case. We have assumed that existing clean resources receive the ACP, either at a level of 10% of the RPS Class 1 ACP (~$7/MWh) or 50% of the RPS Class 1 ACP (~$35/MWh). Under these assumptions, the increase in Massachusetts customer costs under the Existing Clean Replaced case range from $200 to $480 million/year.

Figure 26: Massachusetts Customer Costs



VI. Sensitivity Analysis

To test the robustness of our findings, we examined sensitivity cases with alternative input assumptions. We examined two cases focusing on key drivers affecting the impact of CES-E on costs and CO_2 emissions:

- Low Gas and RGGI Price: Assumes that natural gas and RGGI allowance prices grow only at the rate of inflation across the model time horizon. Lower gas and RGGI prices result in lower energy prices compared to our base case assumptions.
- Increased Renewable and Transmission Cost: Assumes higher investment costs and transmission costs for developing renewables to replace clean energy generated by existing clean resources in the Existing Clean Replaced scenario. In this scenario, transmission costs increase from the base case value of $500/kW of wind to $2,000/kW of wind, consistent with the ISO-NE's Draft 2016 Economic Study: NEPOOL Scenario

Analysis.[21] This case provides an upper bound on the cost of the Existing Clean Replaced scenario.

A. Low Gas and RGGI Prices

Figure 27 compares the results of the Low Gas and RGGI Price sensitivity to Base Case results. The Figure shows that the CO_2 emissions benefits of retaining existing clean resources are essentially the same in the Base Case and Low Gas and RGGI Price cases. Emissions savings are approximately 3.6 million tonnes of CO_2 per year for MA and approximately 7 million tonnes of CO_2 per year for the New England region as a whole on average over 2017–2030. This can be seen by comparing emissions under the Existing Clean Online and Existing Clean Offline scenarios ("[2]-[1] Delta" column in the Figure).

Figure 27 also shows the cost savings of retaining existing clean resources rather than replacing them. Comparing MA customer costs and ISO-NE total resource costs under the Existing Clean Online and Existing Clean Replaced scenarios ("[2]-[3] Delta" column in the Figure) shows that savings are somewhat larger under the Low Gas and RGGI Price sensitivity relative to the Base Case. Across all cost categories (MA Customer Costs at $7 ACP, MA Customer Cost at $35 ACP, and ISO-NE Total System Costs), savings are $80–$100 million per year higher on average between 2017–2030 under the Low Gas and RGGI price sensitivity relative to the Base Case due primarily to the lower cost of imports at the market price of energy.

[21] ISO-NE, "2016 Economic Study: NEPOOL Scenario Analysis–Implications of Public Policies on ISO New England Market Design, System Reliability and Operability, Resource Costs and Revenues, and Emissions", July 24, 2017. $2,000/kW-wind is estimated based on the incremental transmission cost of about $20 billion to facilitate 10 GW of additional onshore wind in Scenario 2 relative to Scenario 1.

Figure 27: CO_2 Emissions and Costs
Low Gas/RGGI Price Sensitivity

		2017-2030 Average				
		[1] Existing Clean Offline (New-Only CES)	[2] Existing Clean Online (Proposed CES-E)	[3] Existing Clean Replaced	[2]-[1] Delta	[2]-[3] Delta
ISO-NE CO2 Emissions						
Base	(MMTCO2)	25.8	18.8	19.2	(7.0)	(0.4)
Low Gas/RGGI	(MMTCO2)	26.4	19.6	20.0	(6.8)	(0.4)
MA's Share of CO2 Emissions						
Base	(MMTCO2)	14.1	10.5	10.6	(3.6)	(0.1)
Low Gas/RGGI	(MMTCO2)	14.5	10.9	11.0	(3.6)	(0.1)
ISO-NE Total System Costs						
Base	(nom.$MM)	$4,318	$4,107	$5,212	($210)	($1,105)
Low Gas/RGGI	(nom.$MM)	$3,374	$3,303	$4,487	($71)	($1,184)
MA Customer Costs						
Base $0	(nom.$MM)	$2,910	$2,684	$3,234	($227)	$324
Base $7 ACP	(nom.$MM)	$2,910	$2,753	$3,234	($157)	($481)
Low Gas/RGGI $7 ACP	(nom.$MM)	$2,417	$2,281	$2,865	($136)	($584)
Base $35 ACP	(nom.$MM)	$2,910	$3,031	$3,234	$120	($203)
Low Gas/RGGI $35 ACP	(nom.$MM)	$2,417	$2,559	$2,865	$141	($306)

B. Increased Transmission Costs

The Increased Renewable and Transmission Costs sensitivity provides an upper-bound estimate of the cost of replacing existing clean resources with new renewables. In this sensitivity case, we assume transmission costs consistent with ISO-NE's 2016 Economic Study Scenario Analysis.[22] Under the study's scenario considering renewables in excess of RPS, the authors determined that integrating 10 GW of wind beyond RPS would require an additional transmission investment of $20 billion, or $2,000/kW of incremental wind. This value is four times larger than the $500/kW of wind transmission cost assumed in our base case.

Applying the higher transmission cost to our analysis, we find that ISO-NE total system costs would increase by approximately $1.2 billion per year under the Existing Clean Replaced scenario compared to our base case transmission cost assumptions. The implied ISO-NE total

22 ISO-New England, "Transmission Transfer Capabilities & Capacity Zone Development", 2016.

system cost savings of retaining existing clean resources, rather than replacing them with new clean resources, would increase from $1.1 billion per year in our base case to $2.3 billion in the high transmission cost sensitivity case. Costs to Massachusetts customers would not increase to the same extent, since some of the replaced clean energy is consumed outside of Massachusetts. Massachusetts customer costs would increase by approximately $500 million relative to the base case transmission assumptions. The implied Massachusetts customer cost savings of retaining existing clean resources rather than replacing them would increase from about $500 million per year under the base case (with $7/MWh ACP) to $1.1 billion per year with higher transmission costs.

VII. Conclusions

In this study, we evaluate the cost and emission impacts of retaining existing clean generators through a CES-E program, compared to scenarios without these existing clean generators and replacing existing clean generators with additional new clean resources. We conclude that retaining the existing clean generators under the CES-E program (including the Seabrook nuclear plant) would result in 3–4 million metric tonnes lower GHG emissions per year in Massachusetts over the period 2017–2030 relative to a scenario without the existing clean generators, which would help the state keep its electric sector-emissions below the 2020 GWSA target of 11–14 million metric tonnes. If the output from existing clean generators is replaced with additional new renewables, the costs to Massachusetts customers would be higher on average by $0.2–$1.2 billion per year relative to the customer costs of retaining the existing clean generators under the CES-E program.

For the ISO-NE system as a whole, total system costs would be higher on average by $1.1–$2.4 billion per year if the existing clean generation is replaced with additional new renewable generation.

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November 30, 2017

Honorable Martin Suuberg
Commissioner
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Dear Commissioner Suuberg:

The New England Power Generators Association ("NEPGA")[1] appreciates the opportunity to provide comments to the Massachusetts Department of Environmental Protection ("MassDEP") on its proposed amendments to CMR 7.75: *Clean Energy Standard* ("CES").

MassDEP promulgated the CES to increase the amount of clean energy generation needed to help the Commonwealth meet the greenhouse gas reduction mandates established under the Global Warming Solutions Act ("GWSA"). However, CES eligibility is currently limited to only those resources that commenced commercial operation after December 31, 2010 (also referred to as "new" resources). The proposal to now extend the CES to resources constructed after 1990 results in a relatively limited amount of eligible resources. This arbitrary date is not representative of the available clean energy in the region which provides substantial contributions to meeting the standards laid out under the emissions protocols of the CES. These vintage requirements deny existing resources the opportunity to contribute their low and zero-carbon attributes and potentially leads to premature retirements of otherwise qualified clean energy generators. Failure to recognize these resources will also unnecessarily lead to inefficient and costlier program compliance, with added costs borne by ratepayers. A broad and non-discriminatory CES, by contrast, will enable the Commonwealth to more quickly and cost-effectively meet the emissions reduction goals required by the GWSA. NEPGA urges MassDEP to remove vintage as a requirement from the CES, allowing all otherwise eligible new and existing resources to compete under the standard.

NEPGA thanks MassDEP for its consideration of these comments.

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[1] The comments expressed herein represent those of NEPGA as an organization, but not necessarily those of any particular member.

Comment 310 CMR 7.75
Clean Energy Standard Review of Options for Expanding the CES
Via Email
climate.strategies@state.ma.us
November 12, 2017

Comment Pilgrim Watch & The Town of Duxbury Nuclear Advisory Committee on 310 CMR 7.75 Clean Energy Standard Review of Options for Expanding CES Eligibility

Pilgrim Watch ("PW") is a non-profit citizen's organization that serves the public interest on issues regarding the Pilgrim Nuclear Power Station specifically and on nuclear power in general. The organization is in Duxbury, Massachusetts. Its membership extends throughout the Commonwealth. The Selectmen appoint the Town of Duxbury Nuclear Advisory Committee to advise on all matters pertaining to the potential impact on the town from the Pilgrim Nuclear Power Station, located near Duxbury, and other nuclear matters.

We support DEP maintaining Clean Energy Credit eligibility to those carbon-free generators that commenced commercial operation after December 31, 2010- maintain current CES eligibility.

We do not support current or any future nuclear reactor qualifying as eligible clean energy generators. Nuclear power companies have been feeding at the trough long enough to the detriment of consumer prices, the environment and development of truly clean energy alternatives. The current standard correctly does not propose to include existing generators in the CES, even if they meet the emissions-based threshold; but DEP again backtracked and is mistakenly re-reviewing eligibility.

Nothing has changed to reverse the findings of DEP commissioned report from Synapse Energy Economics in 2013[1]. It showed that including nuclear in the CES would provide reactors, that are very large generators, a huge number of clean energy credits (CES) resulting in windfall profits to nuclear facilties; not result in a change in regional emissions, because the dirty generators could buy credits from other generators to meet their quota; increase customer's utility bills; and allow reactors to continue to operate by providing them with yet another subsidy. Again, nothing has happened to change those conclusions.

The nuclear power industry's relentless lobbying to be included in both state and federal subidies has not changed either.

On a state level, the nuclear industry succeeded in getting subsidies in other some states such as Connecticut, New York, Illinois and Ohio. Hopefully Massachusetts will resist the nucer industry's lobbying efforts and DEP will not change its vintage requirements.

On the federal level, President Trump and Secretary of Energy Perry issued a proposal to FERC that applies to market electric economies, like ISO. Those markets would be required to provide credit- a consumer subsidy- to power plants with 90-day fuel supplies on site so that they could operate during an emergency

[1] http://www.mass.gov/eea/docs/dep/air/climate/ces-report.pdf

including extreme weather or a natural or man-made disaster. They provide no evidence that it is necessary to support system reliability. It is simply a bailout to nuclear and coal plants that are unable to compete with natural gas and clean generators -wind and solar- and conservation in market systems, like ours.

AG's Multi-State FERC comments are directly applicable to MassDEP's Legacy Proposal

The Massachusetts Attorney General joined other attorney generals and commented to FERC opposing the nuclear/coal bailout.[2] The AG's FERC comments are directly applicable to MassDEP's proposal and show why neither FERC nor DEP should bailout or subsidize nuclear reactors. The State AGs oppose the Proposal for several reasons- reasons for DEP to not support changing the legacy rule. It says that:

> The Proposal's underlying assumption—that electric system reliability or "resilience" is in danger because aging, uneconomic resources are retiring—is wrong. Under the Commission's leadership, the bulk power system is reliable today and will continue to be so in the future. Both DOE's own recent Staff Report and other independent analyses confirm that the risks that supposedly justify the Proposal are manageable and do not justify emergency action favoring articular fuels, but rather counsel for study of continued development of fuel neutral solutions. Moreover, as independent analyses and state experience show, there is no evidence supporting the conclusion that retirement of aging resources or fuel supply issues are jeopardizing electric system reliability, and, to the contrary, clean energy resources and new technologies, coupled with market mechanisms, can serve future needs.
>
> The Proposal will pose unnecessary and unacceptable risks of harm to the States and their residents. The Proposal would drive up ratepayer costs; thwart state energy policies that support competition, innovation, and reduced air pollution; and impede state progress in addressing the risks of climate change.
>
> The Proposal's underlying assumption—that electric system reliability or "resilience" is in danger because aging, uneconomic resources are retiring—is wrong. Under the Commission's leadership, the bulk power system is reliable today and will continue to be so in the future. Both DOE's own recent Staff Report and other independent analyses confirm that the risks that supposedly justify the Proposal are manageable and do not justify emergency action favoring articular fuels, but rather counsel for study of continued development of fuel neutral solutions. Moreover, as independent analyses and state experience show, there is no evidence supporting the conclusion that retirement of aging resources or fuel supply issues are jeopardizing electric system reliability, and, to the contrary, clean energy resources and new technologies, coupled with market mechanisms, can serve future needs.

[2] Initial Comments Of The Attorneys General Of Massachusetts, California, Connecticut, Illinois, Maryland, North Carolina, Oregon, Rhode Island, Vermont, And Washington, Connecticut Department Of Energy And Environmental Protection, Rhode Island Division Of Public Utilities And Carriers, and New Hampshire Office Of The Consumer Advocate http://www.ct.gov/ag/lib/ag/press_releases/2017/20171024_multistate_ferc_comments.pdf

> The Proposal will pose unnecessary and unacceptable risks of harm to the States and their residents. The Proposal would drive up ratepayer costs; thwart state energy policies that support competition, innovation, and reduced air pollution; and impede state progress in addressing the risks of climate change.

DETAILED COMMENTS

- The bailout (FERC Proposal and DEP change to legacy eligibility) is unnecessary to support system reliability.
- The proposal (FERC and DEP's) is contrary to findings of the DOE's staff report and other credible analyses.
- The states' experiences, including Massachusetts, with clean energy development and the retirement of aging, uneconomic generation demonstrates there is no pressing reliability or resilience crisis warranting extraordinary intervention.
- The proposal poses a serious threat of harm to the states and excessive costs to ratepayers.

Excerpts from the Multi-State Comment to FERC follow with comment on applicability to DEP's proposal.

The FERC Bailout Is Unnecessary to Support System Reliability-
So Too is a DEP Change in the legacy Requirement for CECs

The AGOs commented that:

> There is **no evidence that electric system reliability is in any present danger**. DOE's own staff report confirmed this reality earlier this year, *see* DOE Staff Report at 10 & *infra* Section IV.B, as did Commission staff in an October 19, 2017 report to the Commission providing its assessment of energy market conditions during the upcoming winter.[3]
> With the Commission's approval, numerous regional markets operate capacity and other markets to ensure that they have adequate generation resources to meet peak customer demand plus a reserve margin, and thus ensure system reliability over time. FERC Staff Report No. AD13-7-000, *Centralized Capacity Mkt. Design* where *Elements*, at 2 (Aug. 2013), *at* http://www.ferc.gov/CalendarFiles/20130826142258Staff%20Paper.pdf ("[T]he primary goal of each of these markets is the same: ensure resource adequacy at just and reasonable rates through a market-based mechanism that is not unduly discriminatory or preferential as to the procurement of resources."). The capacity markets provide additional payments to generators and other resources to supplement energy revenues, in recognition of the fact that energy revenues alone may not be sufficient for some generators to recover their costs and remain viable. *Id.* capacity markets are successful in procuring needed capacity to ensure system reliability in the regions they operate:[4]

[3] FERC Staff, Winter 2017-18 Energy Market Assessment (Oct. 19, 2017), *available at* https://www.ferc.gov/market-oversight/reports-analyses/mkt-views/2017/10-19-17-A-3.pdf ("Winter Energy Market Assessment").

[4] For information on capacity markets not discussed here, see the comments filed in this docket by certain State Commenters' respective state utilities regulators.

The AGOs provided **Massachusetts as an example**.

> • In 2016, ISO New England's ("ISO-NE") tenth annual capacity auction included stringent requirements to ensure resource performance at times of system stress, concluded at lower price than the previous auction, and procured sufficient resources, including three new conventional power plants, as well as capacity from solar and offshore and onshore wind facilities, to meet projected New England demand in 2019-2020.[5]

They note that **even with the retirement of old uneconomic resources, like Vermont Yankee, is not evidence capacity markets are failing – contrary to nuclear industry lobbyist's claims.**

> The fact that certain older, uneconomic resources do not clear the auctions and are retiring is not evidence that capacity markets are failing; to the contrary, these markets have ensured replacement of retiring resources with new capacity in a manner that has met regional installed capacity and reserve requirements and maintained system reliability.[6] Against this backdrop, there is no need for the Proposal, or anything similar, to safeguard system reliability.[7]

The FERC Proposal Is Contrary to the Findings of the Department of Energy Staff Report and Other Credible Analyses.

> The DOE Staff report on electric markets and reliability does not support the FERC Proposal's immediate and drastic regulatory intervention in the nation's wholesale markets. Moreover, other credible analysis shows that the Proposal's picture of an electric system under siege from "baseload" resource retirements, unreliable replacement resources, and extreme-weather disruptions to fuel supplies is simply not accurate.

The DOE Staff Report Indicates that Electric System Reliability Is Adequate.

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[5] Press Release, ISO-NE, *Finalized Capacity Auction Results Confirm 10th FCA Procured Sufficient Resources, at a Lower Price, for 2019–2020* (Feb. 29, 2016), *at* https://www.isone.com/static-assets/documents/2016/02/20160229_fca10_finalresults.pdf.

[6] *See, e.g., ISO New England Inc. and New England Power Pool Participants Comm.*, 158 FERC ¶ 61,138, at P 9 (2017) ("One purpose of capacity markets is to send appropriate price signals regarding where and when new resources are needed."); *Long Island Power Auth. v. N.Y. Indep. Sys. Operator, Inc.*, 120 FERC ¶ 61,071, at P 14 (2007) ("the [capacity] market would benefit customers by encouraging the construction of new capacity"); *N.Y. Indep. Sys. Operator, Inc.*, 103 FERC ¶ 61,201, at P 36 (2003) ("NYISO's analyses adequately demonstrate that the proposal will benefit customers because it will encourage the construction of new generation."), *aff'd sub nom Elec. Conservation Res. Council v. FERC*, 407 F.3d. 1232 (2005); *ISO New England Inc.*, 148 FERC ¶ 61,201, 2014 WL 4637550, at *4 (2014) (LaFleur, concurring) ("Forward Capacity Market (FCM) plays a vital role in ensuring reliability in New England. [It] is the mechanism that ensures future system reliability by procuring capacity resources sufficient to meet New England's resource adequacy needs.").

[7] The Commission has preexisting tools to address short-term reliability issues that may arise from the retirement of a particular resource, including approval of reliability-must-run agreements with generators, which "should be of a limited duration so as to not perpetuate out-of-market solutions that have the potential, if not undertaken in an open and transparent manner, to undermine price formation" in the wholesale market. *N.Y. Indep. Sys. Operator, Inc.*, 150 F.E.R.C. ¶ 61,116 at P 2 (2015).

Concerns that the declining financial viability of certain conventional power plant technologies (like coal and nuclear power plants) that operate as merchant units in several wholesale electricity markets may be jeopardizing electric system reliability, there is no evidence supporting that conclusion.

Evidence provided here shows the electric system reliability is adequate also.

> The DOE Staff Report expressly affirms the reality that the nation's bulk power system has successfully managed changing market conditions in recent years, including significant levels of retirements of certain resources, and is currently reliable
>
> "[Bulk power system] reliability is adequate despite the retirement of a portion of baseload capacity and unique regional hurdles posed by the changing resource mix." DOE Staff Report at 11.
>
> "[Bulk power system] reliability is adequate today despite the retirement of 11 percent of the generating capacity available in 2002, as significant additions from natural gas, wind, and solar have come online since then. Overall, at the end of 2016, the system had more dispatchable capacity capable of operating at high utilization rates than it did in 2002." *Id.* at 63.
>
> "To date, wholesale markets have withstood a number of stresses. While markets have evolved since their introduction, they are currently functioning as designed—to ensure reliability and minimize the short-term costs of wholesale electricity—despite pressures from flat demand growth, Federal and state policy interventions, and the massive economic shift in the relative economics of natural gas compared to other fuels." *Id.* at 10.
>
> Over the longer term, "NERC reports that all regions project more than sufficient planning reserve margins. . . [P]lanning reserve margins exceed their respective regional targets despite the loss of traditional baseload capacity since 2002." *Id.* at 65. The DOE Staff Report contains a chart, *id.* at 66, showing these planning reserve margins through 2022:
>
> **Other Studies Demonstrate that the Proposal's Focus on "Baseload" Resources and Fuel Supply Is Flawed.**
>
> The Commission should look to independent analyses of the electric markets, which confirm that actual power sector conditions and experience show that the premises of the Proposal's approach of rescuing uneconomic generation resources with federal intervention are mistaken. For example, in June 2017 the international economics consulting firm Analysis Group published a report, Electricity Markets, Reliability and the Evolving U.S. Power System ("Analysis Group Report"),[8] which rebutted the Proposal's understanding that recent changes

[8] Paul Hibbard et al., *Electricity Markets, Reliability and the Evolving U.S. Power System*, Analysis Group (June 2017), *available at* http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ag_markets_reliability_final_june_2017.pdf.

in the wholesale electric markets and resource retirements are imperiling electric system reliability:

> The retirement of aging resources is a natural element of efficient and competitive market forces, and where markets are performing well, these retirements mainly represent the efficient exit of uncompetitive assets, resulting in long-run consumer benefits . . . **Although some commentators have raised concerns that the declining financial viability of certain conventional power plant technologies (like coal and nuclear power plants) that operate as merchant units in several wholesale electricity markets may be jeopardizing electric system reliability, there is no evidence supporting that conclusion.** (Emphasis added)

Indeed, one the nuclear lobbyists favorite, but false, selling points is that the "lights will go out" without them. We know that is not true because when reactors, sometimes more than one, are down for repairs or refueling the lights stay on.

Analysis Group Report at 4-5. The report also cited the promise of advanced energy technologies in serving future reliability needs:

> Many advanced energy technologies can and do provide reliability benefits by increasing the diversity of the system. The addition of newer, more technologically advanced and more efficient natural gas and renewable technologies is rendering the power systems in this country more, rather than less, diverse. These newer generating resources are also contributing to the varied reliability services—such [as] frequency and voltage management, ramping and load-following capabilities, provision of contingency and replacement reserves, black start capability, and sufficient electricity output to meet demand at all times—that electric grids require to provide electric service to consumers on an around-the-clock basis. As a result, increasing quantities of natural gas and renewable generation are increasing the diversity of the power system and supporting continued reliable operations.

Id. at 5. In this regard, the Proposal also ignores DOE's own analyses of the reliability benefits of adding renewable energy to the grid

The Proposal Is Not Responsive to the Circumstances of the Polar Vortex or Recent Extreme Weather Events- Contrary to the Proposal's misconceptions, fuel supply issues played essentially no role in recent customer outages

The FERC Proposal and statements from those who favor older generators, like NE nuclear reactors, to be eligible for CECs say that its proposed subsidies are necessary to address electric reliability issues that are illustrated by the widespread cold-weather event during the winter of 2014 known as the Polar Vortex, as well as other extreme weather events. Not so.

> With regard to the Polar Vortex, large swaths of the eastern and southern parts of the United States faced sustained and record-setting cold weather during that period. According to NERC's post-mortem analysis, less than 0.1 percent of customer load was disrupted in the

affected areas, and system operators "successfully maintained reliability. . . ."[9] In fact, the affected load was in South Carolina Electric and Gas service territory, which is not part of an organized wholesale market, and the outages were caused by frozen equipment at generators, *not* by fuel supply issues. While much of the commentary regarding the Polar Vortex has focused on curtailment of natural gas supplies for electric generation, according to NERC, fuel supply issues accounted for less than half of the generator outages associated with the Polar Vortex. Instead, the majority were associated with the direct effects of cold weather on generation and transmission equipment. *Id.* at 4-5. All generation sources face challenges from extreme weather.[43] Even with on-site fuel supplies, the Proposal's favored resources do not always have the ability to run in challenging weather events, based on recent experience[*See Hurricane Irma Caused Power Outages for Two out of Three Florida Customers*, Electric Light & Power (Sept. 20, 2017), *at* http://www.elp.com/articles/2017/09/hurricane-irma-causedpower-outages-for-two-out-of-three-florida-customers.html **("Hurricane Irma also affected Florida's two nuclear power plants, which are among the largest power plants in the state. Both assumptions about the resilience of the favored resources are false, and that the resilience values of other resources warrant greater consideration**]. Emphasis added.

Extreme Weather - Nuclear Power Unreliable

More extreme weather events are predicted due to global warming. Reactors require offsite power to operate safety systems. In high-wind storm events reactors must shut down as a precautionary measure and remain offline until offsite power is restored. Reactors located on the ocean are susceptible to hurricanes and Nor'easters requiring shutdowns. Also with warming seas, lakes and rivers, shutdowns also are required when the water temperature is not cool enough to dissipate the reactor's excess heat. Nuclear reactors cannot be counted on during extreme events that are likely to occur more frequently in the coming years.

The States' Experiences with Clean Energy Development and the Retirement of Aging, Uneconomic Generation Demonstrates There is No Pressing Reliability or Resilience Crisis Warranting Extraordinary Federal Intervention or changes in the legacy rule

The AGs pointed to states' success in integrating clean energy sources into the electric sector. Massachusetts was cited.

> **Massachusetts** renewable and clean energy projects have added or are in the process of adding a total of approximately 26,000,000 MWh of annual electricity for Massachusetts customers (expected to be over 50% of Massachusetts's annual electric load) under either statutory or regulatory mandates pursuant to the Green Communities Act, St. 2008, c. 169, §§ 83, 83A, 83C, and 83D, and the Renewable Portfolio Standards, Mass. Gen. Laws ch. 25A, § 11F.[10]

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[9] *See* NERC, *Polar Vortex Review* at iii (2014), *at* http://www.nerc.com/pa/rrm/January%202014%20Polar%20Vortex%20Review/Polar_Vortex_Review_29_Sept_2014_Final.pdf.

[10] These projects include onshore and offshore wind, hydropower, and solar. Some of these projects are already in operation, some are under contract and awaiting regulatory approval prior to construction, some are constructed and waiting for interconnection, and others are in the bidding stage.

The AGs made a point of saying that:

> In addition, many states and regional markets have successfully managed the retirement of coal and other uneconomic resources and are pursuing innovations that will benefit system reliability and resilience, including market-based compensation for demand response and investments in energy efficiency, energy storage, and other technologies. For example

Massachusetts was an example. The comment said that:

> In **Massachusetts**, 1,662 MW of coal generation capacity has been retired since 2008, leaving no coal fired power plants in the state. At the same time, Massachusetts has invested heavily in developing a robust clean energy industry, as detailed *infra*, and has become a national leader in energy efficiency. Further, it is actively exploring storage technologies, and the Department of Energy Resources issued a report last fall with the goal of spurring investment in 600 MW of grid-scale energy storage in Massachusetts by 2025.[11]

The Proposal Poses a Serious Threat of Harm to the States and Excessive Costs for Ratepayers.

A. A Federal Mandate to Subsidize the "Fuel-Secure" Resources Will Significantly and Unnecessarily Raise Energy Costs for Consumers

The AGs comment said that there is no question that the FERC Proposal will burden ratepayers with additional costs and risks. It echoes the Synapse Report. Indeed, the Proposal makes no attempt to argue otherwise.[12] Rather, the whole point of the Proposal is to charge customers more money and to give that money to uneconomic generation resources, so they do not retire. One early analysis estimates potential added customer costs in the billions of dollars per year.[13] Yet, the Proposal provides no assessment of, or justification for, those costs or the value of what customers will get in return.

The same can be said for providing subsidies in terms of CECs to older nuclear reactors; also, DEP has not informed the public what doing so would cost.

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[11] Massachusetts Department of Energy Resources, *State of Charge: Massachusetts Energy Storage Initiative Study* (Sept. 16, 2016), *available at* https://www.mass.gov/files/2017-07/stateof-charge-report.pdf.

[12] As noted in Sections I, II.A, and II.B, *supra*, the Proposal provides no analysis regarding the customer costs. The absence of a cost analysis is cause enough for the Commission to reject it.

[13] *See* Robbie Orvis et al., *The Department of Energy's Grid Resilience Pricing Proposal: A Cost Analysis*, Energy Innovation (Oct. 2017), *available at* http://energyinnovation.org/wpcontent/uploads/2017/10/20171021_Resilience-NOPR-Cost-Research-Note-FINAL.pdf (annual cost to customers conservatively estimated at $2.4 -10.6 billion); ICF International, Inc., *DOE Acts to Transform the Energy Landscape*, at 27 [Webinar] (Oct. 4, 2017), *available at* https://www.icf.com/resources/webinars/2017/doe-nopr (cost could reach $3.8 billion per year); *see also* Jeff St. John, *FERC Commissioners and Staff Question DOE's Push for Cost Recovery for Coal and Nuclear*, Greentech Media (Oct. 10, 2017), *at* https://www.greentechmedia.com/articles/read/ferc-commissioners-and-staff-question-doespush-for-cost-recovery-for-coal#gs.lnQFaSg.

B. The FERC & DEP Proposal Undermines State Energy Laws and Policies.

The AGs provided state-by-state examples. Massachusetts example shows that "[I]f the Commission were to impose on Massachusetts ratepayers a "cost-of-service" regime to support coal and nuclear generating resources, it would directly interfere with and contradict the Massachusetts legislature's intent to shield ratepayers from the operational risks and investment decisions of all generating resources. Further, Massachusetts's major investments in renewables and energy efficiency are deliberate efforts to create a clean energy industry and to address the risks of climate change. The Proposal is directly at odds with the energy policy chosen by Massachusetts. The clean energy industry is a powerful and growing economic engine for Massachusetts."

The comment said:

> In 1997, the Massachusetts Legislature enacted the Electric Industry Restructuring Act to restructure its electric utility industry. *See* Mass. St. 1997, ch. 164. The general purpose of the Restructuring Act was to take electric utilities out of the generation portion of the electricity business. *See* Mass. Gen. Laws ch. 164, §1A(b)(2) (referencing the electric companies' "requirement to divest generation facilities"). The Massachusetts Department of Public Utilities ("Department") has held that its limited role over the generation component of electricity service following the Restructuring Act "represents a clear policy choice that electric generation resources are best developed in response to price signals from a competitive marketplace." *Investigation by the Dep't of Pub. Utils.*, Mass. D.P.U. 12-77, at 28 (2013). More importantly, by moving electricity generation outside of the Department's jurisdiction and into the competitive marketplace, the Department found that the Restructuring Act "shifted the risks of generation development from consumers to generators, who are better positioned to manage those risks." *Id.* This shift in risk allowed consumers to benefit from lower prices for electricity while also enjoying protection from the "construction, operational, and prices risks that were inherent in commodity rate regulation." *Id*. **Clearly, if the Commission were to impose on Massachusetts ratepayers a "cost-of-service" regime to support coal and nuclear generating resources, it would directly interfere with and contradict the Massachusetts legislature's intent to shield ratepayers from the operational risks and investment decisions of all generating resources. (**Emphasis added**)**
>
> **Further, Massachusetts's major investments in renewables and energy efficiency are deliberate efforts to create a clean energy industry and to address the risks of climate change. The Proposal is directly at odds with the energy policy chosen by Massachusetts**. Massachusetts has adopted a broad portfolio of laws and regulations to reduce economy-wide greenhouse gas emissions by 25 percent by 2020 and 80 percent by 2050 from 1990 levels, including the Global Warming Solutions Act (2008), the Green Communities Act (2008), the Act to Promote Energy Diversity (2016), RGGI, and programs to promote low and zero-emission vehicles, among others. **The clean energy industry is a powerful and growing economic engine for Massachusetts**. The state has seen consistent growth across all aspects of the clean energy sector, from energy efficiency to alternative transportation, to renewable energy development. **Clean energy contributes $11.8 billion to the Massachusetts economy— a 2.5 percent share of the gross state product—and its employees account for 2.9 percent of the state's labor market. Since 2010, the number of clean energy jobs has increased dramatically — 45,000 new clean energy jobs have been added, a 75 percent increase.**[93]

[93] Massachusetts Clean Energy Center, *2016 Massachusetts Clean Energy Industry Report*, at

3-4, 8 (Dec. 2016), *available at* http://files.masscec.com/2016%20MassCEC_CE_Report_Complete%20%281%29-2.pdf. shown that states can grow their economies through investing in clean energy and reducing greenhouse gas emissions. The Proposal's attempt to force Massachusetts to subsidize nuclear and fossil fuel generating resources in contravention of its carefully developed renewable energy and climate policies is overreaching and inappropriate.

C. Federal Intervention to Prolong the Life of Coal-Fired Power Plants Will Exacerbate the Public Health and Environmental Harms Caused by Such Facilities.

The same is true for nuclear reactors. Federal or state intervention to prolong the life of nuclear reactors will exacerbate the public health and environmental harms caused by such facilities.

Public Health

Carbon Dioxide is not the only pollutant on the planet. It is a leading cause of climate change; but that does not mean that carbon dioxide is the only pollutant that matters to the health, safety, and our economy. **Radiation** is a persistent poison that acts synergistically with other pollutants. Radiation is released daily from reactors into the air and water. The National Academy of Sciences (NAS) latest report on radiation risk, called the BEIR VII report ("BEIR" stands for the Biological Effects of Ionizing Radiation) was issued June 2005. Its conclusion was simple: No amount of radiation is safe, and women and children are the most at risk.

The National Academy reported that overall cancer mortality risks for females are 37.5 percent higher than for men, and the risks for all solid tumors (lung, breast, and prostate) are almost 50 percent higher. The differential risk for children is even greater. The same radiation in the first year of life for children produces three to four times the cancer risk as exposure between the ages of 20 and 50. Female infants have almost double the risk as male infants

Massachusetts Department of Health Southeastern Massachusetts Health Study 1990 found a four-fold increase in adult leukemia the closer one lived or worked at Pilgrim. The footprints of radiation diseases have persited in communties nearby.

International studies- A major epidemiological study published in the January 2012 edition of *The International Journal of Cancer* showed that childhood leukemia doubled around French and German reactors. Additional research after accidents -Three Mile Island, Chernobyl and Fukushima show the harmful effects of radiation exposure.

Environmental Impact

Once Through Cooling: All nuclear reactors, generate too much heat. To remove excess heat, reactors draw in huge quantities of water from whatever water source they are located on- ocean, bay, river, lake. Pilgrim, for example, draws in over 500 million gallons of water a day from Cape Cod Bay. Along with the water, it sucks in fish eggs and other microscopic organisms. Larger fish get pulled in by the current too and become trapped on intake screens. The marine life that is drawn in gets pulverized by the reactor condenser system and emerges as sediment that clouds the water around the discharge area, often blocking light from the ocean floor. The sediment cloud results in killing plant and animal life by curtailing the light and oxygen needed to survive. The water that is drawn in cycles through the reactor cooling system, and is then released back into the bay at temperatures 30 degrees above Bay temperature (62F to 100F) – disrupting the

ecosystem. The water discharge temperature is averaged over an hour time. But when the reactor is abruptly shut down, water temperatures will drop causing cold-stunning, fatal to fish acclimated to warmer waters. The same occurs at the Millstones and Seabrook.

Conclusion

We urge DEP to maintain Clean Energy Credit eligibility to those carbon-free generators that commenced commercial operation after December 31, 2010 – maintain current CES eligibility. We are joined by the Selectmen and citizens of the Town of Duxbury that voted in favor of the Annual Town Meeting article, number 41, that read:

> The Town of Duxbury supports the Massachusetts Department of Environmental Protection's proposed regulations to increase the percentage of electricity sold to consumers in Massachusetts that is generated using clean, carbon-free energy by providing clean energy credits only to carbon-free electric power generators that began operations after December 31, 2010.

Thank you in advance for your consideration, sincerely,

Mary Lampert
Pilgrim Watch, director
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Tel. 718-934-0389
Email: mary.lampert@comcast.net

Rebecca Chin
Town of Duxbury Nuclear Advisory Committee, co-chair
31 Deerpath Trail, North
Duxbury, MA 02332
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Email rebeccajchin@hotmail.com

Pilgrim Legislative Advisory Coalition

P.O. Box 823, Yarmouth Port MA 02675

Commissioner Martin Suuberg
Massachusetts Department of Environmental Protection
1 Winter Street
Boston, MA 02108

November 30, 2017

Dear Commissioner Suuberg,

As the Massachusetts Department of Environmental Protection considers expanding the Clean Energy Standard to include older generators (CES-E), the Pilgrim Legislative Advisory Coalition would like to make you aware of the attached petition that was signed by 215 people and sent to William Space at MassDEP.

Including Pilgrim among the generators eligible to receive clean energy credits would go against the recommendations of the 2013 Synapse Energy Economics that was commissioned by the Commonwealth. The Synapse report clearly warned that the CES could be a "viable, cost-effective option for Massachusetts as long as 'windfall' Clean Energy Credit payments are not made to owners of resources, such as nuclear and natural gas, that will not contribute to new greenhouse gas emission reductions."

We agree with the conclusions of the Synapse report and urge MassDEP not to extend eligibility for clean energy credits to older generators such as Pilgrim.

Thank you for your consideration of this request.

Sincerely,

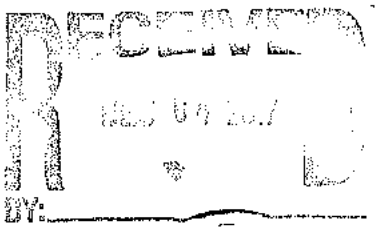
On behalf of the Pilgrim Legislative Advisory Coalition

James R. Garb, M.D.
jimgarb@comcast.net

Attachment

Supporting Organizations

- Association to Preserve Cape Cod
- Cape Cod National Seashore Advisory Cttee
- Cape Downwinders Cooperative
- Pilgrim Watch
- Protect Our Cape Cod Aquifer
- Toxics Action Center (Boston)



Pilgrim Legislative Advisory Coalition advocates to protect the health, safety, environmental, and economic interests of Massachusetts citizens through responsible public policy on nuclear energy.

William Space
Massachusetts Department of Environmental Protection
Martin Suuberg, Commissioner, Massachusetts Department of Environmental Protection

November 22 – 27, 2017

RE: CES-E

Dear Mr. Space and Commissioner Suuberg,

I am writing to urge that the Massachusetts Department of Environmental Protection not reverse its Clean Energy Standard (CES) regulation which limits eligibility for clean energy credits only to newer generators.

Because of its abysmal record of poor maintenance, mechanical failures, safety and technical violations, as well as its grossly inadequate containment design (all problems which affect and threaten our environment), Massachusetts' sole nuclear power generator, Pilgrim Nuclear Power Station (PNPS), should not be subsidized for operation beyond its scheduled closure date of the 31st of May, 2019.

Radioactive emissions may not be addressed in the Global Warming Solutions Act, but they are relevant to the DEP's mission of environmental stewardship: "...to protect and enhance the Commonwealth's natural resources – air, water, land – and to provide for the health, safety, welfare and enjoyment of the people and the protection of their property". PNPS emits dozens of radionuclides into the air and water daily, all of them carcinogenic, and the National Academy of Sciences has established that there is no safe dose of radiation.

It is non-sensical to call nuclear energy "clean". On a bad day PNPS could render hundreds of square miles of land uninhabitable for generations to come. On good days it creates waste of unrivaled toxicity, for which no suitable storage method has been found after a half-century of production. That waste is a desirable target for terrorists, and a dirty bomb would wreak environmental havoc.

While the expanded Clean Energy Standard (CES-E) has the worthy goal of minimizing greenhouse gas emissions, the mining, refinement, enrichment and transport of the nuclear fuel used by PNPS do generate considerable greenhouse gasses, as will efforts to store its waste.

PNPS has been allowed to operate for over 20 years with an expired Cooling Water Intake Structure Permit (CWIS). Since a proper cooling structure would be a significant expense to Pilgrim's operator, this represents a subsidy paid largely by the environment. During operation, PNPS extracts 510 million gallons of seawater daily from Cape Cod Bay, entraining, impinging, and killing thousands of marine organisms. PNPS releases chemicals which are introduced into its water waste stream as corrosion inhibitors and algae killers. In 2000 the Massachusetts Office of Coastal Zone Management reported: "Twenty-five years of data clearly show that millions of fish larva and eggs are destroyed by PNPS every year...". The half-billion gallons of water is returned to the Bay 30 degrees hotter, a direct impact on global warming which does not reconcile with the CES' broad goal of slowing the rate of global warming.

Giving clean energy credits to PNPS would not result in the generation of new clean energy. Instead, Entergy would sell the credits to coal, oil and gas powered generators, thus allowing those generators to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

ISO-NE reports there is over 14% reserve capacity in the New England Power Pool (NEPOOL), so we don't need PNPS's 2% capacity contribution (even on the hottest day of the summer with peak use of air conditioning). One of the oldest operating reactors in the nation, PNPS, with 2 other Entergy reactors, has occupied the bottom rung of the NRC's reactor oversight scorecard for several years. Its poorly maintained infrastructure will continue to be unreliable without major investment, and no operator is likely to pour money into it at this stage. Government-mandated, ratepayer-financed, subsidies-via-CECs may allow PNPS to continue operation, but there is no guarantee that it will even be a reliable generator, let alone a safe one.

Eleven states (including our Commonwealth and four others among the six within NEPOOL) have opposed a recent Federal Energy Commission proposal for new subsidies to nuclear and coal. We believe the following objections from that filing apply to MDEP's CES-E proposal as well:
The proposal (which could subsidize coal and nuclear) lacks factual and evidentiary basis; the timeline for considering the proposal prevents participants from commenting fully on the many complex issues raised by the proposal; the proposal fails to articulate a reasoned basis for its changes; the proposal is unnecessary to support system reliability; electric system reliability is adequate; further analysis of resilience and wholesale market changes are needed, not immediate regulatory intervention; other studies demonstrate that the focus on "baseload" resources and fuel supply is flawed; the proposal is not responsive to the circumstances of recent extreme weather events; experience with clean energy development and the retirement of aging, uneconomical generation demonstrates there is no pressing reliability or resilience crisis; the proposal poses a serious threat of harm and excessive costs for ratepayers; the proposal undermines state energy laws and policies; prolonging the life of coal-fired power plants will exacerbate the public health and environmental harms caused by such facilities.

When PNPS goes down, which it does frequently, no one's lights go out. We need not prop up polluting technologies, which includes Pilgrim. Pilgrim should close no later than May 31, 2019, and we should emphasize the development of truly green and sustainable sources such as solar, wind, hydro, storage, and tidal without heating Cape Cod Bay or continuing the potential for devastating hazards. The Synapse report, commissioned by the Commonwealth in 2013, found that the Massachusetts Clean Energy Standard would accomplish the desired results if nuclear were not included to receive clean energy credits. That was sound advice in 2013 and it remains sound advice today.

Thank you for your consideration.

The Pilgrim Legislative Advisory Coalition, with 182 signatures

Pilgrim Legislative Advisory Coalition

P.O. Box 2712, Orleans MA 02653

Pilgrim Legislative Advisory Coalition comment on reducing greenhouse gas emissions under section 3(D) of the Global Warming Solutions Act

To climate.strategies@state.ma.us

William Space, Senior Technical Advisor for Climate Programs
Mass Department of Environmental Protection ,

Dear Mr. Space

We represent the Pilgrim Legislative Advisory Coalition, a citizen's organization based on Cape Cod that works to protect the economic, environmental, health and safety interests of Massachusetts citizens through responsible public policy on nuclear energy. It serves the public interest on issues regarding the Pilgrim Nuclear Power Station specifically and on nuclear power in general.

Supporting Organizations

- Association to Preserve Cape Cod
- Cape Cod National Seashore Advisory Cttee
- Cape Downwinders Cooperative
- Pilgrim Watch
- Protect Our Cape Cod Aquifer
- Toxic Action Center (Boston)

Gratified by the decision made on August 11, 2016 on Clean Energy Standards, we do not support Pilgrim or any future nuclear reactors qualifying as eligible clean energy generators. The standard as currently written does not include generators that went online prior to December 31, 2010 in the CES, even if they meet the emissions-based threshold. However it is our understanding that DEP is now reconsidering a change in this decision. We believe this would be an unacceptable outcome for a number of reasons.

The nuclear industry is hard at work, especially the Entergy Corporation, owner of Pilgrim Nuclear Power Station. Were it to receive Clean Energy Credits, this aging and failing nuclear reactor could be sold and continue operating until 2032 under its current license. Nuclear reactors, being large units, would receive numerous credits which could then be sold to the dirtiest polluters enabling them to continue operating "business as usual", spewing carbon into the air. It makes little sense to establish an energy policy that ends up substituting one poison for another (carbon).

When developing a Clean Energy Standard, the particular details of the only nuclear generator in the Commonwealth must not be ignored. Pilgrim is the same failed design as the reactors at Fukushima, and one of the three worst performing nuclear reactors in the country. A number of months ago, a damning interim report on Pilgrim's safety status was released to the public by the NRC inspection team at Pilgrim. This interim assessment described, among other troubling findings, inadequate installation of new equipment,

ongoing corrective action program problems, procedural non-compliance, poor maintenance, poor engineering practices, and equipment reliability problems. While independent nuclear experts believe Pilgrim should be closed immediately, at this time the NRC plans to allow Pilgrim to continue operating until its target closure date in June of 2019.

The MA DEP commissioned Synapse Energy Economics to prepare a report to assist in developing a Clean Energy Standard. Five key conclusions came from this report and concluded that the analysis showed that CES designed as load-serving-entities portfolio standard can serve as a viable, cost effective option for Massachusetts as long as windfall CEC payments are not made "to owners of resources such as nuclear and natural gas that will not contribute to new greenhouse gas emission reductions". Though these windfall payments made to nuclear facilities would reap profits for them, there would be no change in regional emissions but with one other very important outcome to customers….they would have utility bills grow by 4 percent by 2020 and 6 percent in 2030. This must be a part of the consideration if there were a change in CES because it involves the pocketbooks of all citizens of the Commonwealth.

In the Appendix to the 2015 Update of the Clean Energy and Climate Plan for 2020, the statement is made that the CES could also create a framework for other technologies that could meet the emissions threshold, including next-generation nuclear power. But meanwhile, there should be no room in the CES for a failing last-generation nuclear power generator such as Pilgrim. They have been receiving subsidies for too long, to the detriment of consumer prices, the environment and the development of truly clean energy alternatives which have been a hallmark for the Baker administration..

Nuclear power can only produce electricity. In the generation of that electricity, the building of those generators, the reactors, are never part of the discussion by the industry nor is much attention paid to the uranium mining, transportation and disposal of that waste that goes into that part of the production and end result. Mining uranium poses substantial threats to miners, local communities and the larger environment. Nuclear power plants are unique in their potential to cause catastrophic damage due to natural disasters, mechanical failure, human error, sabotage or terrorism. The industry would have us believe otherwise, but nuclear energy is far from clean.

For all the reasons described above, Pilgrim, designed using 60's technology, built in 1972 having acknowledged flaws and operating as one of three with the worst record on safety, should not receive CEC. From a public health perspective, we deserve better from our regulators.

In summary, the proposed language for 310 CMR 7.75 defines Non-emitting Electricity Generators as those powered by hydro, nuclear, ocean, solar or wind power. Inclusion

of nuclear as a non-emitting generator will have no effect on reducing emissions, will result in windfall profits for the nuclear generator licensee, and will result in significant increases in ratepayers' electric bills. It will allow the generation of greenhouse gases from the processing and transport of nuclear fuel to continue, and will allow the Pilgrim Nuclear Power Station, one of the three nuclear generators in the country with the worst safety records, to continue to imperil the population and environment of Eastern Massachusetts while it sells its clean energy credit to other dirty polluters. And it will further delay the transition to TRULY clean energy sources: hydro, ocean, solar and wind. Massachusetts has built on its reputation as a leader in green energy; please don't make a decision that will move further away from the goals that have been wisely set forth up until now. We are seeing extremely disappointing practices on the Federal level, Mass can continue to do the right, the best thing for the citizens of the Commonwealth……again. Reject a change in our CES.

Respectfully submitted,

Pilgrim Legislative Advisory Coalition

Coordinating Committee

Janet Azarovitz

Jim Garb, MD.

David Agnew

No more subsidies to keep Pilgrim Nuclear running! (PLAC* petition to Massachusetts DEP)

TO: William Space, Massachusetts Department of Environmental Protection
Martin Suuberg, Commissioner, Massachusetts Department of Environmental Protection

I am writing to urge that the Massachusetts Department of Environmental Protection not reverse its Clean Energy Standard (CES) regulation which limits eligibility for clean energy credits only to newer generators.
Because of its abysmal record of poor maintenance, mechanical failures, safety and technical violations, as well as its grossly inadequate containment design (all problems which affect and threaten our environment), Massachusetts' sole nuclear power station, Pilgrim Nuclear Power Station (PNPS), should not be subsidized for operation beyond it's scheduled closure on May 31, 2019.

Radioactive emissions may not be addressed in the Global Warming Solutions Act, but they are relevant to the DEP's mission of environmental stewardship: "...to protect and enhance the Commonwealth's natural resources – air, water, land – and to provide for the health, safety, welfare and enjoyment of the people and the protection of their property". PNPS emits dozens of radionuclides into the air and water daily, all of them carcinogenic, and the National Academy of Sciences has established that there is no safe dose of radiation.

It is non-sensical to call nuclear energy "clean". On a bad day PNPS could render hundreds of square miles of land uninhabitable for generations to come. On good days it creates waste of unrivaled toxicity, for which no suitable storage method has been found after a half-century of production. That waste is a desirable target for terrorists, and a dirty bomb would wreak environmental havoc.

While the expanded Clean Energy Standard (CES-E) has the worthy goal of minimizing greenhouse gas emissions, the mining, refinement, enrichment and transport of the nuclear fuel used by PNPS do generate considerable greenhouse gasses, as will efforts to store its waste.

PNPS has been allowed to operate for over 20 years with an expired Cooling Water Intake Structure Permit (CWIS). Since a proper cooling structure would be a significant expense to Pilgrim's operator, this represents a subsidy paid largely by the environment:

During operation, PNPS extracts 510 million gallons of seawater daily from Cape Cod Bay, entraining, impinging, and killing thousands of marine organisms. PNPS releases chemicals which are introduced into it's water waste stream as corrosion inhibitors and algae killers. In 2000 the Massachusetts Office of Coastal Zone Management reported: “Twenty-five years of data clearly show that millions of fish larva and eggs are destroyed by PNPS every year...” The The half-billion gallons of water is returned 30 degrees hotter, direct global warming which does not reconcile with the CES' broad goal of slowing the rate of global warming.

Giving clean energy credits to PNPS would not result in the generation of new clean energy. Instead, Entergy would sell the credits to coal, oil and gas powered generators, thus allowing those generators to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

ISO-NE reports there is over 14% reserve capacity in the New England Power Pool (NEPOOL), so we don't need PNPS's 2% capacity contribution (even on the hottest day of the summer with peak use of air conditioning). One of the oldest operating reactors in the nation, PNPS, with 2 other Entergy reactors, has occupied the bottom rung of the NRC's reactor oversight scorecard for several years. Its poorly maintained infrastructure will continue to be unreliable without major investment, and no operator is likely to pour money into it at this stage. Government-mandated, ratepayer-financed, subsidies-via-CECs may allow PNPS to continue operation, but there is no guarantee that it will even be a reliable generator, let alone a safe one.

Eleven states (including our Commonwealth and four others among the six within NEPOOL have opposed a recent Federal Energy Commission proposal for new subsidies to nuclear and coal. I believe the following objections from that filing apply to MDEP's CES-E proposal as well:

The proposal (which could subsidize coal and nuclear) lacks factual and evidentiary basis; the timeline for considering the proposal prevents participants from commenting fully on the many complex issues raised by the proposal; the proposal fails to articulate a reasoned basis for its changes; the proposal is unnecessary to support system reliability; electric system reliability is adequate; further analysis of resilience and wholesale market changes are needed, not immediate regulatory intervention; other studies demonstrate that the focus on “baseload” resources and fuel supply is flawed; the proposal is not responsive to the circumstances of recent extreme weather events; experiences with clean energy development and the retirement of aging, uneconomic generation demonstrates there is no pressing reliability or resilience crisis; the proposal poses a serious threat of harm and

excessive costs for ratepayers; the proposal undermines state energy laws and policies; prolonging the life of coal-fired power plants will exacerbate the public health and environmental harms caused by such facilities.

When PNPS goes down, which it does frequently, no one's lights go out. We need not prop up polluting technologies, which includes Pilgrim. Pilgrim should close no later than May 31, 2019, and we should emphasize the development of truly green and sustainable sources such as solar, wind, hydro, storage, and tidal without heating Cape Cod Bay, or continuing the potential for devastating hazards. The Synapse report, commissioned by the Commonwealth in 2013, found that the Massachusetts Clean Energy Standard would accomplish the desired results if nuclear were not included to receive clean energy credits. That was sound advice in 2013 and it remains sound advice today.

Thank you for your consideration.

Signed by 215 people prior to MDEP's comment deadline of 12/1/17 and sent electronically from change.org to climate.strategies@state.ma.us

* PLAC is Pilgrim Legislative Advisory Coalition plac-ma.org

FW: Comment on Proposed Changes to CES

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 11/13/2017 8:21 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Monday, November 13, 2017 8:01 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: Comment on Proposed Changes to CES

From: Jim Garb
Sent: Monday, November 13, 2017 8:00:54 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: Comment on Proposed Changes to CES

November 13, 2017

Pilgrim Legislative Advisory Coalition comment on reducing greenhouse gas emissions under section 3(D) of the Global Warming Solutions Act

The Pilgrim Legislative Advisory Coalition is a citizen's organization based on Cape Cod that works to protect the health, safety, environmental, and economic interests of Massachusetts citizens through responsible public policy on nuclear energy. It serves the public interest on issues regarding the Pilgrim Nuclear Power Station specifically and on nuclear power in general.

Gratified by the decision made on August 11, 2017 to limit the awarding of clean energy credits to generators that came online since 2010, we do not support Pilgrim or any future nuclear reactors qualifying as eligible clean energy generators. The standard as currently written does not include generators that went online prior to December 31, 2010 in the CES, even if they meet the emissions-based threshold. However it is our understanding that DEP is now reconsidering a change in this decision. We believe this would be an unacceptable outcome for a number of reasons.

Were Pilgrim to receive Clean Energy Credits, this aging and failing nuclear reactor could be sold and continue operating until 2032 under its current license. Nuclear reactors, being large units, would receive numerous credits which could then be sold to the dirtiest polluters enabling them to continue operating "business as usual", spewing carbon into the air. This would be counterproductive to the goals of the Clean Energy Standard and the Global Warming Solutions Act. It makes little sense to establish an energy policy that ends up substituting one poison (radiation) for another (carbon), while at the same time allowing the nuclear industry to help the dirty generators continue to pollute the air.

When developing a Clean Energy Standard, the particular details of the only nuclear generator in the Commonwealth must not be ignored. Pilgrim is the same failed design as the reactors at Fukushima, and one of the three worst performing nuclear reactors in the country. A year ago, a damning interim

report on Pilgrim's safety status was released to the public by the NRC inspection team at Pilgrim. This interim assessment described, among other troubling findings, inadequate installation of new equipment, ongoing corrective action program problems, procedural non-compliance, poor maintenance, poor engineering practices, and equipment reliability problems. While independent nuclear experts believe Pilgrim should be closed immediately, at this time the NRC plans to allow Pilgrim to continue operating until its target closure date in June of 2019. But under no circumstances should Pilgrim be allowed to operate for another 15 years. Classifying Pilgrim as a clean energy generator would do just that.

When Mass CEC commissioned the Synapse Report in 2013, one of the key conclusions reached by Synapse was "Overall, our analysis concludes that a CES designed as a LSE portfolio standard can be a viable, cost-effective option for Massachusetts **as long as "windfall" CEC payments are not made to owners of resources, such as nuclear and natural gas, that will not (in the policy as modeled) contribute to new (additional) greenhouse gas emission reductions.**" (emphasis added)

Don't award windfall CEC payments to Pilgrim. Such payments will not contribute to new greenhouse gas emission reductions, and will only serve to undermine the goals of the program, while extending the life of a hazardous nuclear reactor.

Sincerely,

James R. Garb, MD

Pilgrim Legislative Advisory Coalition

jimgarb@comcast.net

FW: Is this any better?

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Tue 10/24/2017 4:09 PM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>;

From: Strategies, Climate (DEP)
Sent: Tuesday, October 24, 2017 4:07 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: Is this any better?

From: Janet
Sent: Tuesday, October 24, 2017 4:06:27 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP); Space, William (DEP)
Subject: Fw: Is this any better?

Pilgrim Legislative Advisory Coalition (PLAC) would like this comment on the Clean Energy Standards expansion recorded on public record, as I was unable to attend the meeting at the State House on October 24, 2017.

Thank you.
janet azarovitz, on behalf of the Pilgrim Legislative Advisory Coalition coordinating committee

Pilgrim Legislative Advisory Coalition

Pilgrim Legislative Advisory Coalition comment on reducing greenhouse gas emissions under section 3(D) of the Global Warming Solutions Act

We represent the Pilgrim Legislative Advisory Coalition, a citizen's organization based on Cape Cod that works to protect the health, safety, environmental, and economic interests of Massachusetts citizens through responsible public policy on nuclear energy. It serves the public interest on issues regarding the Pilgrim Nuclear Power Station specifically and on nuclear power in general.

Gratified by the decision made on August 11, 2016 on Clean Energy Standards, we do not support Pilgrim or any future nuclear reactors qualifying as eligible clean energy generators. The standard as currently written does not include generators that went online prior to December 31, 2010 in the CES, even if they meet the emissions-based threshold. However it is our understanding that DEP is now reconsidering a change in this decision. We believe this would be an unacceptable outcome for a number of reasons.

The nuclear industry is hard at work, especially the Entergy Corporation, owner of Pilgrim Nuclear Power Station. Were it to receive Clean Energy Credits, this aging and failing nuclear reactor could be sold and continue operating until 2032 under its current license. Nuclear reactors, being large

units, would receive numerous credits which could then be sold to the dirtiest polluters enabling them to continue operating "business as usual", spewing carbon into the air. It makes little sense to establish an energy policy that ends up substituting one poison for another (carbon).

When developing a Clean Energy Standard, the particular details of the only nuclear generator in the Commonwealth must not be ignored. Pilgrim is the same failed design as the reactors at Fukushima, and one of the three worst performing nuclear reactors in the country. A number of months ago, a damning interim report on Pilgrim's safety status was released to the public by the NRC inspection team at Pilgrim. This interim assessment described, among other troubling findings, inadequate installation of new equipment, ongoing corrective action program problems, procedural non-compliance, poor maintenance, poor engineering practices, and equipment reliability problems. While independent nuclear experts believe Pilgrim should be closed immediately, at this time the NRC plans to allow Pilgrim to continue operating until its target closure date in June of 2019.

The MA DEP commissioned Synapse Energy Economics to prepare a report to assist in developing a Clean Energy Standard. Five key conclusions came from this report and concluded that the analysis showed that CES designed as load-serving-entities portfolio standard can serve as a viable, cost effective option for Massachusetts as long as windfall CEC payments are not made "to owners of resources such as nuclear and natural gas that will not contribute to new greenhouse gas emission reductions". Though these windfall payments made to nuclear facilities would reap profits for them, there would be no change in regional emissions but with one other very important outcome to customers….they would have utility bills grow by 4 percent by 2020 and 6 percent in 2030. This must be a part of the consideration if there were a change in CES because it involves the pocketbooks of all citizens of the Commonwealth.
In the Appendix to the 2015 Update of the Clean Energy and Climate Plan for 2020, the statement is made that the CES could also create a framework for other technologies that could meet the emissions threshold, including next-generation nuclear power. But meanwhile, there should be no room in the CES for a failing last-generation nuclear power generator such as Pilgrim. They have been receiving subsidies for too long, to the detriment of consumer prices, the environment and the development of truly clean energy alternatives which have been a hallmark for the Baker administration..

Nuclear power can only produce electricity. In the generation of that electricity, the building of those generators, the reactors, are never part of the discussion by the industry nor is much attention paid to the uranium mining, transportation and disposal of that waste that goes into that part of the production and end result. Mining uranium poses substantial threats to miners, local communities and the larger environment. Nuclear power plants are unique in their potential to cause catastrophic damage due to natural disasters, mechanical failure, human error, sabotage or terrorism. The industry would have us believe otherwise, but nuclear energy is far from clean.

For all the reasons described above, Pilgrim, designed using 60's technology, built in 1972 having acknowledged flaws and operating as one of three with the worst record on safety, should not receive CEC. From a public health perspective, we deserve better from our regulators.

In summary, the proposed language for 310 CMR 7.75 defines Non-emitting Electricity Generators as those powered by hydro, nuclear, ocean, solar or wind power. Inclusion of nuclear as a non-emitting generator will have no effect on reducing emissions, will result in windfall profits for the nuclear generator licensee, and will result in significant increases in ratepayers' electric bills. It will allow the generation of greenhouse gases from the processing and transport of nuclear fuel to continue, and will allow the Pilgrim Nuclear Power Station, one of the three nuclear generators in the country with the worst safety records, to continue to imperil the population and environment of Eastern Massachusetts while it sells its clean energy credit to other dirty polluters. And it will further delay the transition to TRULY clean energy sources: hydro, ocean, solar and wind. Massachusetts has built on its reputation as a leader in green energy; please don't make a decision that will move further away from the goals that have been wisely set forth up until now. We are seeing extremely disappointing practices on the

Federal level, Mass can continue to do the right, the best thing, for the citizens of the Commonwealth……again. Reject a change in our CES.

Respectfully submitted, for public record

Pilgrim Legislative Advisory Coalition

Coordinating Committee

Janet Azarovitz

Jim Garb, MD.

David Agnew

PO Box 383
Madison, CT 06443
Voice: 646-734-8768
Email: fpullaro@renew-ne.org
Web: renew-ne.org

November 30, 2017

Via climate.strategies@state.ma.us

Will Space
Massachusetts Department of Environmental Protection
One Winter St.
Boston, MA 02108

Subject: Amending the CES: CES-E

Mr. Space:

In response to the Massachusetts Department of Environmental Protection ("MassDEP") communication inviting public comment on the proposal described in the October 2017, MassDEP Stakeholder Discussion Document to add a separate requirement in 310 CMR 7.75 to support existing clean generators (a "CES-E"), RENEW Northeast, Inc. ("RENEW") submits these comments.[1]

RENEW is a non-profit association uniting environmental advocates and the renewable energy industry whose mission involves coordinating the ideas and resources of its members with the goal of increasing environmentally sustainable energy generation in the Northeast from the region's abundant, indigenous renewable resources. RENEW has focused on highlighting the value of grid-scale renewable resources- specifically land-based and offshore wind, solar and hydropower- and the benefits of transmission investment to deliver renewable energy to load centers in the Northeast. RENEW members own and/or are developing large-scale renewable energy projects and high-voltage transmission facilities across the Northeast. They are supported by members providing engineering, procurement and construction services in the development of these projects and members that supply them with multi-megawatt class wind turbines.

RENEW supports the concept in the Stakeholder Discussion Document of a requirement on retail electricity sellers to purchase annually clean energy certificates ("CEC-Es") from existing clean generators but with the following modifications.

[1] The comments expressed herein represent the views of RENEW and not necessarily those of any particular member of RENEW.

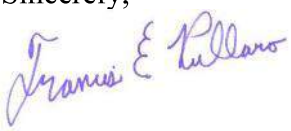
First, the cost to consumers to comply with a CES-E can be reduced by increasing the pool of non-emitting resources eligible under a CES-E compared to the proposal. RENEW recommends MassDEP eliminate the proposed vintage restriction that would limit CES-E generation resources to those built after 1990. Otherwise, the proposal will disqualify cost-effective non-emitting resources, particularly the fleet of small hydropower, contributing to the 1990 baseline. Making this change will enable Massachusetts to claim carbon benefits from potentially the most cost-competitive carbon-free resources, and increase the likelihood that the Global Warming Solutions Act ("GWSA") greenhouse gas reduction requirements can be maintained through 2050.

Second, more competitive outcomes will be achieved if the CES-E features a single annual aggregate demand target allocated to individual retailer sellers based on load share rather than using recent historical data as proposed. This approach also simplifies the CES-E concept and promotes more agnostic and cost-effective results by creating a single product pool.

Third, RENEW recommends the Alternative Compliance Payment ("ACP") value be set at a level to induce retail sellers to procure CES-Es rather than make ACP payments. That level should reflect the intended optimization and maintenance of existing non-emitting resources. If the ACP is set too low, retail sellers might be more inclined to pay the ACP rather than procure CES-Es, and/or the valuation may be insufficient to encourage existing non-emitting resources to continue operating and contributing towards GWSA requirements. An ACP set at 10 percent of the Class I Renewable Portfolio Standard ACP as proposed in the Stakeholder Discussion Document will almost certainly encounter these issues and hinder MassDEP's efforts to maintain these existing resources for the long term.

Thank you for the opportunity to provide these comments.

Sincerely,



Francis Pullaro
Executive Director

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF ENVIRONMENTAL PROTECTION

310 CMR 7.75: CLEAN ENERGY STANDARD - REVIEW OF OPTIONS FOR EXPANDING THE CES	: : : :	NOVEMBER 30, 2017

COMMENTS OF
RETAIL ENERGY SUPPLY ASSOCIATION

The Retail Energy Supply Association ("RESA")[1] hereby submits its comments in response to the Department of Environmental Protection's ("Department" or "DEP") Stakeholder Discussion Document ("Discussion Document") in connection with the above-referenced matter.

INTRODUCTION

RESA is a non-profit organization and trade association that represents the interests of its members in regulatory proceedings in the Mid-Atlantic, Great Lakes, New York and New England regions. RESA members are active participants in the retail competitive markets for electricity, including the Massachusetts retail electric market. Several RESA member companies are licensed by the Department of Public Utilities ("DPU") to serve residential, commercial and industrial customers in Massachusetts and are presently providing electricity service to customers in the Commonwealth. As such, RESA and its members have an interest in ensuring that the expansion of the Clean Energy Standard ("CES") does not have an adverse effect on

[1] The comments expressed in this filing represent the position of the Retail Energy Supply Association (RESA) as an organization but may not represent the views of any particular member of the Association. Founded in 1990, RESA is a broad and diverse group of more than twenty retail energy suppliers dedicated to promoting efficient, sustainable and customer-oriented competitive retail energy markets. RESA members operate throughout the United States delivering value-added electricity and natural gas service at retail to residential, commercial and industrial energy customers. More information on RESA can be found at www.resausa.org.

RESA members, their customers or the continued success of the competitive retail electric market in Massachusetts.

BACKGROUND

In August 2017, DEP issued the CES, which requires that utilities and competitive suppliers procure a minimum percentage of electricity sales from clean energy sources beginning in 2018.[2] To qualify as clean energy sources under the CES, clean energy generators must either be renewable portfolio standard ("RPS") Class I eligible or:

- Demonstrate net lifecycle greenhouse gas ("GHG") emissions of at least 50% below those from the most efficient natural gas generator;
- Be located in the ISO New England control area, or be located in an adjacent control area and utilize transmission capacity that commenced operation after 2016; and
- Have commenced commercial operation after December 31, 2010.[3]

By December 31, 2017, the Department is required to review the CES to evaluate options for: (a) expanding these requirements to permit generators that satisfy all but the commercial operation date (i.e., "vintage") requirements to qualify as CES-eligible; and (b) including Municipal Electric Departments and Municipal Light Boards in the standard.[4]

In accordance with this requirement, in October 2017, DEP held several stakeholder meetings and issued the Discussion Document seeking more specific comment on these expansion topics. RESA now hereby submits its comments in response to the Discussion Document.

[2] 310 C.M.R. 775(4).
[3] 310 C.M.R. 775(7)(a).
[4] 310 C.M.R. 775(10).

COMMENTS

In evaluating the options for expanding the CES, RESA urges the Department to ensure that the expansion provides for market liquidity, protects existing customer expectations, and is instituted in a competitively neutral fashion.

I. THE CES PROGRAM DESIGN SHOULD PROVIDE FOR AS MUCH LIQUIDITY IN THE MARKET AS POSSIBLE

In the Discussion Document, the Department requested comment on amending the CES to permit energy procured pursuant to the Energy Diversity Act ("EDA")[5] to qualify as CES-eligible.[6] In order to provide the most flexibility in the market and mitigate the impact of the expanded CES upon Massachusetts customers consistent with Executive Order 562,[7] RESA recommends that the Department permit any type of resource that will help the Commonwealth to meet its GHG reduction goals to qualify as clean generation. By ensuring that the broadest set of resources are eligible, the Department can also maximize liquidity in the CES certificate market and, as a result, reduce the cost of CES certificates and minimize the cost impacts to ratepayers. Thus, as a general matter, RESA supports the expansion of the CES eligibility requirements to include resources procured pursuant to the Energy Diversity Act. However, in order to increase liquidity and reduce the costs of CES compliance, those resources must be made available to the market.

Pursuant to the Energy Diversity Act, electric distribution companies ("EDCs") are required to conduct solicitations for proposals for and enter into long-term contracts with

[5] Session Law: Chapter 188 of the Acts of 2016, *An Act to Promote Energy Diversity*.

[6] Discussion Document, at 2.

[7] E.O. 562, §§ 3, 5 (new regulations should not "unduly and adversely affect Massachusetts citizens and customers…").

offshore wind energy generation,[8] and firm service hydroelectric generation from hydroelectric generation alone; new Class I RPS eligible resources that are firmed up with firm service hydroelectric generation; or new Class I renewable portfolio standard eligible resources.[9] EDCs can then, at their election, retain any renewable energy credits ("RECs") purchased pursuant to such long-term contracts to meet the RPS or sell them though a competitive process.[10] After issuing the Discussion Document, the Department proposed amendments to the CES that would expand the definition of Clean Generation Attribute to include "any other generation attribute that is ***retained*** pursuant to Section 83D(h) of Chapter 169 of the Acts of 2008, as inserted by Section 12 of Chapter 188 of the Acts of 2016."[11]

Because, as written the proposed amendment would only permit the use of "retained" Energy Diversity Act RECs, only the EDCs would be able to use those RECs to satisfy the CES. If an EDC is permitted to retain RECs whenever it deems appropriate, it reduces liquidity in the market. The lack of available RECs in the market increases the likelihood that the cost of RECs will substantially increase based on the economic principles of supply and demand as well as retail suppliers will be compelled to make alternative compliance payments ("ACPs") in order to comply with the CES,[12] which undermines the CES's objective of increasing the level of clean

[8] *See* Energy Diversity Act, § 83C.

[9] *See id*. at § 83D.

[10] *Id.* at §§ 83C(h), 83D(h); *see also* 220 CMR § 17.06.

[11] *See* Proposed Amendments (available at: http://www.massdep.org/BAW/air/ces1117-dreg.pdf), at 2 (emphasis added).

[12] *See* 310 C.M.R. 775(2) (defining CES Alternative Compliance Payment as: "A payment of a certain dollar amount per MWh, resulting in the issuance of CES alternative compliance credits, which a retail seller of electricity may submit to the Department in *lieu* of providing clean generation attributes required . . . .") (emphasis in original).

generation.[13] Thus, the Department should require the EDCs to conduct a competitive bid process to sell any Energy Diversity Act RECs. In this way, the Department can reduce the cost impact to ratepayers from both the CES and the Energy Diversity Act. First, the competitive bid process would increase liquidity in the market; thereby, reducing the cost of RECs to satisfy the CES. Second, if EDCs are required to sell any Energy Diversity Act RECs, customers are also likely to benefit from increased instances of arbitrage in the REC market that will be used to offset the costs that the EDCs incur to comply with the Energy Diversity Act.[14] By offering the Energy Diversity Act RECs for sale, the EDCs will receive funds to offset the costs incurred under the Energy Diversity Act contracts. Thus, the overall cost of Energy Diversity Act compliance is reduced. Since the costs the EDCs incur for complying with the act are passed onto ratepayers,[15] the overall cost to ratepayers is also concomitantly reduced. Accordingly, RESA requests that, to the extent the Department permits Energy Diversity Act resources to qualify as CES eligible, it requires the EDCs to make the RECs associated with such contracts available in the market and that it permit suppliers to use Energy Diversity Act RECs they have purchased from the EDCs to comply with the CES.

[13] 310 C.M.R. 775(1) ("The purpose of this regulation . . . is to assist the Commonwealth in achieving the greenhouse gas emissions reduction goals . . . by establishing a clean energy standard (CES) that will increase the level of clean electricity that is purchased from the regional electric grid for consumption in Massachusetts.").

[14] Energy Diversity Act §§ 83C(i), 83D(i) ("If a distribution company . . . auctions the renewable energy certificates as described in this section, the distribution company shall net the cost of payments made to projects under the long-term contracts against the net proceeds obtained from the sale of energy and renewable energy certificates, and the difference shall be credited or charged to all distribution customers through a uniform fully reconciling annual factor in distribution rates, subject to review and approval of the department of public utilities.").

[15] Energy Diversity Act, §§ 83C(e) ("A distribution company shall be entitled to cost recovery of payments made under a long-term contract approved under this section.").

II. EXISTING CLEAN GENERATION SHOULD BE CES-ELIGIBLE

In the Discussion Document, the Department also requested comment on including existing generation in the CES.[16] Pursuant to the Massachusetts Global Warming Solutions Act ("GWSA"), the Department is required to reduce GHG emissions below 1990 levels. RESA supports allowing any type of resource, including existing resources without regard to size, location[17] or technology, that will help the Commonwealth to reduce GHG emissions below 1990 levels, to qualify as CES-eligible because it will increase liquidity in the market and reduce the cost of complying with the CES. In this way, the Department can ensure that it does not cause the retirement of existing zero emission or low emission generation resources that would otherwise contribute to cost-effectively attaining the emission reduction targets because they are not given the same incentives as "new" generators. By ensuring that the broadest set of resources are eligible, the Department can also maximize liquidity in the CES certificate market and, as a result, reduce the cost of CES certificates and minimize the cost impacts to ratepayers. However, the Department should refrain from creating two tiers of CES-eligible resources. If a resource reduces GHG emissions below 1990 levels, it should be included in the CES and treated in the same way no matter its vintage.

III. ANY EXPANSION OF THE CES SHOULD BE DONE IN A MANNER THAT PROTECTS EXISTING CUSTOMER EXPECTATIONS

An important design element of any program is to ensure that it does not disrupt or otherwise harm existing stakeholder expectations. As the Department most certainly appreciates, the competitive electricity market in the Commonwealth continues to advance and retail electricity suppliers continue to enter into contractual obligations, often with multi-year terms of

[16] Discussion Document, at 2-5.

[17] As the Department is aware, GHGs do not respect state borders. Thus, clean generation in one state can help reduce GHG emissions in other states.

service, while changes to regulations are being proposed and promulgated by the Department. However, retail electricity suppliers do not take market positions or enter into agreement terms with customers based simply on the announcement that a regulatory change may occur or even based on the release of proposed regulatory revisions. Rather, since announced or even proposed regulatory revisions are subject to change based on legislative considerations as well as the regulatory input process, retail electricity suppliers take market positions and enter into agreements based only on actual regulatory requirements officially promulgated by the governing regulatory authority. In this way, customers are not exposed to unnecessary price increases and/or pricing volatility as a result of speculative regulatory changes that may never be adopted or that may be significantly modified through the regulatory process before such changes ultimately become effective. Accordingly, retail electricity suppliers have entered into and will continue to enter into agreements with customers based on their current obligations. Only once the Department officially promulgates any amendments to the CES will retail electricity suppliers modify their market positions and/or the terms of their agreements with customers to account for any new or modified regulatory requirements.

When a new or modified obligation is imposed, it impacts existing contracts that were priced based on any prior obligation and may have a term of service that extends over multiple years. While retail electricity suppliers may have contractual and legal means to address change of law circumstances, these mechanisms will have a direct and immediate financial impact to customers, who have contracted for a fixed price and will now be subject to new and unanticipated charges that are not within their budgets. These unanticipated charges place customers in an untenable position as they may be required to retroactively pay these costs per the terms of their contractual agreements. The retroactive cost impact is particularly difficult for

local and state governments as well as institutional customers like hospitals and colleges that generally have limited budgetary flexibility. Moreover, they undermine the customers underlying confidence that the competitive electricity market can provide and deliver the type of pricing products they desire and have contracted to meet their energy needs. Accordingly, in order to avoid disrupting these existing agreements, RESA requests that, just as the Department recognized an exemption from the CES for existing contracts at the time it promulgated the original regulations,[18] it also recognize an exemption from any expansion that creates any new compliance obligation (e.g., a requirement to purchase CES-E certificates).[19]

Further, RESA requests that the Department recognize that any new compliance obligation can effect a variety of pricing structures. The CES permits an exemption from its compliance obligation for 2018 and 2019 for the "portion of electrical energy sales that were subject to a contract executed or extended prior to August 11, 2017, provided that the electricity was sold at a price specified in the contract and the retail seller provides the Department with satisfactory documentation of the terms of such contracts."[20] Recently, the Department issued an Existing Contracts Form[21] and Workbook[22] that suppliers who wish to claim the exemption must complete. In the Existing Contracts Form, DEP has indicated that the exemption only applies to contracts in which a ***total (i.e., all-in) fixed price*** is specified in the contract. This limitation is not in the CES and fails to recognize that there are a variety of pricing arrangements that are affected by any new compliance obligations. In fact, a customer may have a contract that contains different specified pricing options for the various elements of the energy. For instance, a

[18] 310 C.M.R. 775(5)(d).
[19] Discussion Document, at 4-5 (contemplating a separate CES-E requirement).
[20] 310 C.M.R. 775(5)(d).
[21] Available at: https://www.mass.gov/files/documents/2017/11/22/ces-ecform_0.doc.
[22] Available at: https://www.mass.gov/files/documents/2017/11/22/ces-ecwkbk.xls.

customer may have a contract pursuant to which it pays a fixed price for energy and RECs and the remainder of the elements (e.g., capacity, etc.) are purchased as a pass-through of the wholesale cost. In this case, even though the all-in price is not fixed, the portion of the price in which REC costs are included is indeed specified and fixed. In these circumstances, in order for the supplier to pass through the costs of this new compliance obligation, it must invoke the change of law provision in the contract. Thus, RESA requests that the Department modify the exemption qualification parameters to recognize that customers enter into a variety of pricing arrangement, beyond all-in fixed prices, that are affected by new compliance obligations.[23]

IV. THE CES PROGRAM DESIGN SHOULD BE COMPETITIVELY NEUTRAL

The CES does not include requirements for municipal utilities.[24] In the Discussion Document, the Department requested comment on the options for including municipal utilities in the CES.[25] Municipal utilities contribute to GHG emissions and should concomitantly be required to contribute to their reductions. Moreover, in those cases in which municipal utilities have been exempted from certain requirements, the legislature has done so explicitly.[26] In this case, the GWSA specifically imposes upon "municipal electric departments and municipal light boards" the requirements applicable to retail electricity suppliers.[27] Accordingly, pursuant to the plain language of the GWSA, the CES should be applied to municipal utilities.

The municipal utilities should also be subject to the same requirements as other retail sellers of electricity. Imposing the CES on municipal utilities in this manner will ensure that the

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[23] E.O. 562, § 3.

[24] *See, generally,* 310 C.M.R. 775.

[25] *See* Discussion Document, at 5-7.

[26] *See, e.g.,* M.G.L. c. 25A, § 11F(i) ("A municipal lighting plant shall be exempt from the obligations under this section so long as and insofar as it is exempt from the requirements to allow competitive choice of generation supply under section 47A of chapter 164.").

[27] M.G.L. c. 21N, § 2(a)(5) ("[T]his requirement shall apply to all retail sellers of electricity, including electric utilities, municipal electric departments and municipal light boards . . . .").

obligation is instituted in a fair, balanced and competitively neutral fashion. Because municipal utilities are exempt from numerous regulatory requirements, retail electric suppliers are already faced with questions from customers about why they can purchase power for a significantly lower cost from municipalities. Permitting municipal utilities to forego or limit their obligations under the GWSA will only further exacerbate this issue. Thus, the Department should not permit the municipal utilities to be discounted for the full amount of the RPS standard *ad infinitum*.[28] Instead, the Department should adopt the proposed phase-in schedule, which would gradually reduce the discount, so that, by 2050, all retail sellers of electricity, including municipal utilities, are subject to the same standard. In this way, the Department can ensure the CES is implemented in a more competitively neutral manner while still affording the municipal utilities a more gradual phase in of the obligations.

CONCLUSION

For all of the foregoing reasons, RESA urges the Department to ensure that the expansion of the CES provides for market liquidity, protects existing customer expectations and is instituted in a competitively neutral fashion.

Respectfully submitted,
RETAIL ENERGY SUPPLY ASSOCIATION

By: 

Joey Lee Miranda
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103
Phone: (860) 275-8227
Fax: (860) 275-8299
E-mail: jmiranda@rc.com

[28] Discussion Document, at 6.

WEST BOYLSTON MUNICIPAL LIGHTING PLANT

4 Crescent Street, West Boylston, Massachusetts 01583
Telephone (508) 835-3681 Fax (508) 835-2952

November 30, 2017

Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Subject: Review of Options for Expanding the Clean Energy Standard

Dear MassDEP,

On behalf of the Town of West Boylston's municipal lighting department (WBMLP) and its ratepayers, we thank you for the opportunity to submit comments related to the expansion of the Clean Energy Standard (CES) to include municipal utilities. Like many Massachusetts' municipal light plants, WBMLP has led the Commonwealth in promoting and investing in renewable and clean energy. WBMLP's past, current, and future owned and contracted generation portfolio places us at the forefront of the Commonwealth's efforts to transition to clean energy and we look forward to working with MassDEP on the shared objective of reducing greenhouse gas (GHG) emissions from the electric sector.

WBMLP's non-GHG emitting energy supply, as a percentage of sales, was 50.1% in 2013[1]. In comparison, investor owned electric utilities and competitive suppliers reported only 8.2% and 0.1% respectively as non-emitting MWh's in 2013. WBMLP's ratepayers already pay for an existing clean energy supply that exceeds MassDEP's proposed CES standard through 2040. The ability to regulate at the local level resulted in our acquisition of significant amounts of existing non-GHG emitting energy generation at highly competitive electricity rates. By the end of 2016, WBMLP purchased 64% of its annual power supply through non-GHG emitting solar, wind, nuclear, and hydroelectric generation assets and purchase power agreements (PPA). Our local regulatory process will continue to support both renewable and clean energy because of Massachusetts' municipal light plants unique vertically integrated structure, legislative authority, and ratepayer input.

Options for Expanding the CES: The CES-E

Should ownership and contracts with existing low and zero emission generation sources be allowed to meet the CES obligation instead of subtracting from annual compliance amounts (netting).

[1] http://www.mass.gov/eea/docs/dep/air/climate/13rsesum.pdf

Yes, all existing CES qualified generation should meet CES eligibility no matter its size, operation date, vintage of its transmission lines, or location within or connection to the ISO-NE control area. Recognizing existing clean energy generation as eligible is not resource shuffling and nor does it create windfall profits over the long-term goal of reducing GHG emissions. All existing clean and renewable energy generation will meet the end of their useful equipment lifecycles much sooner than 2050 and will need to be replaced with new clean and renewable generation.

MassDEP needs to recognize the early environmental benefits of all existing clean energy generation that contributed to the Commonwealth's electric sector 48% reduction in GHG emissions since 1990. MassDEP cannot and should not pick winners and losers in defining CES eligible generators. Existing generation has a critical role to play in maintaining our Commonwealth's low GHG emissions especially through 2020 and 2030 timeframes. Allowing existing clean generation to qualify will provide these sources an economic incentive to remain operational through their equipment lifecycles.

WBMLP's ratepayers already pay for significant volumes of non-emitting clean energy. For example, WBMLP owns and purchases 44% of its annual energy supply from the Seabrook and Millstone nuclear power plants with contractual obligations that extend through the expected 2050 and 2045 relicensing dates. WBMLP purchases 4% of its supply from imported New York hydroelectricity and this contract extends through 2057. Various other contracts totaling approximately 13% of our energy supply extend through mid-2030. WBMLP's existing non-GHG emitting energy should meet the CES obligation and not be "net" out of those volumes. Counting our existing clean energy volumes would allow WBMLP to prepare a long-term energy strategy for additional clean and renewable energy as these contractual obligations end.

How would CES-E address MLP's relationship with existing clean generators?

Hydroelectricity is an important component of our long-term clean energy supply. WBMLP imports low-cost hydroelectricity from New York into ISO-NE for the benefit of our ratepayers. As the Commonwealth considers a plan for Investor Owned Utilities (IOUs) to purchase and import hydroelectricity from Canada, it is important to recognize that municipal light plants have already done so since 1985 through contracts we negotiated and aggressively preserve on behalf of our ratepayers. WBMLP's existing imported hydroelectricity should be allowed for use towards compliance with CES.

Nuclear power is another critical base component of our clean energy portfolio. WBMLP contractually participates in two nuclear power plants and receives a proportional share of energy from these existing clean generators. Our ratepayers paid for the development and safe operation of these plants, and presently, these assets generate a large percentage of our clean and low-cost energy. The environmental benefits of nuclear energy are just being realized, as it emits zero GHG's and is extremely reliable. All existing and new nuclear energy contracts should meet CES obligations.

Creating a CES-E would strengthen the value of energy from these clean energy sources. The CES-E would allow MLPs to create new and additional contractual obligations for CES-E qualified energy to incentivize the long-term economic value of these sources and ensure they operate through their entire lifecycles.

Options for Expanding the CES: Municipal Utilities

MassDEP requested comments on whether the originally proposed CES standard for MLPs should be discounted by the RPS obligation.

The proposed CES standard for MLPs should be discounted by the RPS obligation. MLPs are specifically exempted from the RPS requirement and legislative authority would be required to remove this exemption. If MassDEP removes the RPS component, the actual CES obligation would be 35% by 2050. WBMLP already exceeds this obligation through its exiting clean energy supply and our long-term energy supply planning would ensure continued compliance beyond 2050.

Is not allowing the use of pre-existing contracts for which REC's have been sold to third parties correct?

Municipal light plants should be able to count all purchases from renewable energy sources regardless of whether they retained the RECs. WBMLP had, and still has no RPS obligation and would have made other business decisions related to PPAs had we known that retaining the RECs would impact us today in our ability to meet CES obligations. WBMLP was instrumental in expanding renewable energy sources and creating a supply of RECs throughout Massachusetts and the ISO-NE control area. WBMLP's actions to foster renewable energy development occurred prior to the development of a proposed MLP CES. WBMLP's existing PPA's for both wind and hydroelectric projects provided a supply of RECs that are assisting the Commonwealth in reaching its renewable goals. Because of this supply of RECs, the price per REC is held to its lowest possible level and therefore minimizes the impact on ratepayers. WBMLP's ability to contractually purchase unit-contingent, long-term energy from renewable sources made those projects financeable in the first place.

What is best way to include MLPs in the CES?

The best way to include WBMLP in any CES is to recognize the statutory and regulatory governance of municipal light plants. Accordingly, municipal light plants should be excluded from a mandatory CES and they should continue to be regulated at the local level with the flexibility to develop their own programs to reduce GHGs. Local control provides the greatest investment and flexibility allowing us to best meet clean energy objectives locally. The local control approach has already proven to be successful. WBMLP and other MLPs already have made the decision locally to invest in renewable and clean sources. Some MLPs are already choosing to purchase 100% of the entire power supply from renewable and clean sources. MassDEP should exclude WBMLP from all CES obligations because, through local control, our

local officials will make decisions that promote and provide incentives for renewable and clean energy resources.

If MassDEP does include municipal light plants in the CES, as noted above, all existing renewable and clean energy purchases should be counted. In addition, the collection and use of any CES alternative compliance payments (ACP) should remain with each municipal light plant and these funds should be used solely for new renewable and clean energy generation projects. Projects built by WBMLP would ensure least cost generation and each municipal light plant could invest in the most appropriate clean energy technologies best suited for their communities and supported by their ratepayers.

MassDEP and DOER's August 2017 *Analysis of Massachusetts Electricity Sector Regulations*[2] (authored by Synapse, SEA and ERG) finds that there is no significant difference in emission reductions as a result of the CES compared to doing nothing. For this reason, the CES ACP for MLPs should be set at a low rate. The ACP should be determined by calculating the shortage of CES MWh's to meet the annual CES obligation, multiplied by the CES ACP rate of 0.10 (10%) times rate calculated annually by DOER pursuant to 225 CMR 14.08(3)(a)2 for that compliance year.

MassDEP designed the IOU CES obligations to increase in small annual increments. If MLPs are included in the CES, the timeframe for initially meeting a CES obligation should start in 2030 to allow most preexisting emitting and non-emitting contracts for energy to end. WBMLP also suggests an annual MLP CES obligation should be staged in blocks to reflect the larger impact that clean and renewable projects have as a percentage of our annual requirements. Because of our extensive contractual obligations, annually increasing 1-3% is not practical for WBMLP especially in the short term. It would make more sense for WBMLP to meet the obligation in 10-year stages, *e.g.*, 15% for 2030-2039; 30% for 2040 – 2049.

What are the legal and contractual issues faced by MLPs?

The application of a CES obligation on municipal light plants is not supported by the plain language of the Global Warning Solutions Act (GWSA) or mandated by the Supreme Judicial Court's "Kain" decision. The Massachusetts Department of Environmental Protection (MassDEP) lacks the legislative authority to regulate municipal light plant generation and power purchases as GWSA does not specifically authorize and never intended to impose CES requirements on municipal light plants. GWSA only imposes a reporting requirement on MLPs.

In addition, GWSA legally requires the Secretary of the Executive Office of Energy and Environmental Affairs (EEA) to "evaluate the total potential costs and economic and noneconomic benefits of various reduction measures[3]". Electricity Bill Impact studies prepared

[2] http://www.mass.gov/eea/docs/dep/air/climate/3dapp-study.pdf

[3] https://malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter298

for EEA only address the cost impact on IOU ratepayers. The exclusion of municipal light plants from any of MassDEP's cost impact studies to date supports our position MLPs were not intended to be included in a CES. If a CES is imposed on municipal light plants, WBMLP requests that EEA prepare a cost impact study for WBMLP's ratepayers in advance of requiring CES purchases or contracts on their behalf.

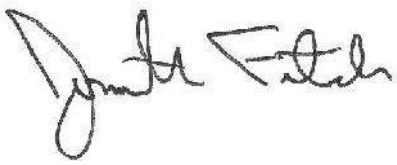
WBMLP is contractually obligated to purchase through ownership contracts and long-term PPAs a volume of generation that represents a majority of our annual energy supply. More than 62% of WBMLP's long-term energy portfolio is composed of existing clean energy supply obligations that extend beyond 2030. Only a small percentage of our annual energy supply is fulfilled through ISO-NE day-ahead and real-time energy market purchases. The ability to own generation and execute long-term energy supply contracts is one of many distinct features that differentiate municipal light plans from distribution companies or IOUs.

Because of our long-term power supply contracts, it is not fair to our ratepayers to impose a CES on WBMLP or to exclude WBMLP's existing low and zero GHG emitting generation assets from qualifying under a CES program. If CES regulations apply to municipal light plants and CES regulations exclude existing clean energy generation, WBMLP would be forced to either purchase additional volumes of CES qualified energy, purchase CEC's, or, make alternative compliance payments. Either option will significantly increase the cost of electricity to our ratepayers.

Conclusion

On behalf of WBMLP's ratepayers and for the various reasons outlined in this letter, please consider our concerns and requests regarding the proposed CES regulations.

Sincerely,



General Manager

FW: Clean Energy Credits must not be provided for Pilgrim Nuclear

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Wed 10/25/2017 11:32 AM

CES and Auction Comments

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Wednesday, October 25, 2017 10:54 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: Clean Energy Credits must not be provided for Pilgrim Nuclear

---

From: David Agnew
Sent: Wednesday, October 25, 2017 10:54:14 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Cc: GOffice@state.ma.us
Subject: Clean Energy Credits must not be provided for Pilgrim Nuclear

Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I have heard that MassDEP is reconsidering it's decision to exclude generators which began operation prior to 2010 from receiving clean energy credits. I don't know if this is true or if another year is under consideration for a cut-off.

I am writing to urge that you reject any proposal which might allow Pilgrim Nuclear to receive CECs. As you know, Fitzpatrick Nuclear in upstate New York, owned at the time by Pilgrim's owner, Entergy Corp, was scheduled for permanent closure when New York began giving it CECs; this suddenly made it desireable, Entergy sold it and it may operate for many more years.

Nuclear power IS NOT CLEAN ENERGY, it never has been. All commercial nuclear reactors release dozens of carcinogenic radionuclides to the air and water daily, and generate the most hazardous waste known to man (waste for which no satisfactory disposal method has been found over 70 years). This is true even with a perfect record of operational safety record, and Pilgrim's is one of the worst safety records of any U.S. reactor.

Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one´s lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Thank you for your consideration.

Sincerely,
David Agnew
18 Marthas Lane
Harwich, MA 02645

FW: comments

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Fri 10/27/2017 12:31 PM

CES and Auction Comments

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Friday, October 27, 2017 12:29 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: comments

From: michelearmour@aol.com
Sent: Friday, October 27, 2017 12:29:17 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: comments

To climate.strategies@state.ma.us
Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we need not prop up polluting

technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Thank you for your consideration.

Sincerely,
Michele Armour
P.O. Box 543
West Falmouth, MA 02574

FW: Pilgrim Power Plant

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 10/30/2017 8:48 AM

CES and Auction Comments

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Saturday, October 28, 2017 9:24 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: Pilgrim Power Plant

From: Melissa Bird
Sent: Saturday, October 28, 2017 9:23:47 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: Pilgrim Power Plant

Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I too am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Thank you for your consideration.

Sincerely,

Melissa Bird

Harwich

FW: No Clean Energy Credits for Pilgrim Nuclear

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 10/30/2017 8:48 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Sunday, October 29, 2017 12:24 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: No Clean Energy Credits for Pilgrim Nuclear

From: S LAWRENCE DINGMAN
Sent: Sunday, October 29, 2017 12:24:15 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: No Clean Energy Credits for Pilgrim Nuclear

Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one´s lights go out. In other words, we need not prop up polluting to insure an essential power supply!

Larry Dingman

670 Massasoit Road
Eastham, MA 02642
508-240-3986

FW: No Clean Energy Credits for Pilgrim Nuclear

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Wed 10/25/2017 11:32 AM

Inbox

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Wednesday, October 25, 2017 11:18 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: No Clean Energy Credits for Pilgrim Nuclear

From: S LAWRENCE DINGMAN
Sent: Wednesday, October 25, 2017 11:17:36 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: No Clean Energy Credits for Pilgrim Nuclear

Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

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Thank you for your consideration.

Sincerely,

Larry Dingman

670 Massasoit Road
Eastham, MA 02642
508-240-3986

FW: No Clean Energy Credits for Pilgrim

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Tue 11/14/2017 10:38 AM

CES and Auction Comments

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Tuesday, November 14, 2017 10:29 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: No Clean Energy Credits for Pilgrim

From: Jim Garb
Sent: Tuesday, November 14, 2017 10:28:55 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: No Clean Energy Credits for Pilgrim

To climate.strategies@state.ma.us
Martin Suuberg, Commissioner Mass DEP

Dear Commissioner Suuberg,

I am writing to urge that Mass DEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

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Thank you for your consideration.

Sincerely,

James R. Garb, MD
Yarmouth Port, MA

FW: CES-E Comments

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Tue 10/17/2017 11:48 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Tuesday, October 17, 2017 8:55 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: CES-E Comments

From: Jim Garb
Sent: Tuesday, October 17, 2017 8:54:30 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: CES-E Comments

Martin Suuberg
Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP does not reverse its regulation limiting eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power plant, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim can hardly be considered emissions free. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer when everyone is running their air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we would have ample time to take Pilgrim offline and continue to aggressively develop solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without the potential for devastating hazards.

Thank you for your consideration.

Sincerely,

James R. Garb, MD FACOEM
Occupational & Environmental Medicine Consultant
Yarmouth Port, MA
jimgarb@comcast.net

FW: No Clean Energy Credits for Pilgrim Nuclear

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 10/23/2017 8:42 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

-----Original Message-----
From: Strategies, Climate (DEP)
Sent: Sunday, October 22, 2017 8:24 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: No Clean Energy Credits for Pilgrim Nuclear

From: Laurie Gates
Sent: Sunday, October 22, 2017 8:24:06 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: No Clean Energy Credits for Pilgrim Nuclear

Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.
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Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one´s lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Thank you for your consideration.

Sincerely,
Laurie Gates

FW: No Clean Energy Credits for Pilgrim Nuclear

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 10/30/2017 8:43 AM

CES and Auction Comments

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Friday, October 27, 2017 3:46 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: No Clean Energy Credits for Pilgrim Nuclear

From: Richard Guernsey
Sent: Friday, October 27, 2017 3:45:14 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: No Clean Energy Credits for Pilgrim Nuclear

Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one´s lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

I really do not see why anyone would even think of reversing this regulation to the advantage of Pilgrim’s owner!

Thank you for your consideration.

Sincerely,

---Richard M. Guernsey
rmguernsey@me.com
130 Paine Hollow Road
Wellfleet, MA 02667

FW: comment

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Wed 10/18/2017 3:23 PM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Wednesday, October 18, 2017 3:23 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: comment

From: bennyg576@aol.com
Sent: Wednesday, October 18, 2017 3:22:54 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: comment

Martin Suuberg

Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP does not reverse its regulation limiting eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power plant, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim can hardly be considered emissions free. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim received clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue generating electricity, polluting, and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer when everyone is running their air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we would have ample time to take Pilgrim offline and continue to aggressively develop solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without the potential for devastating hazards.

Thank you for your consideration.

Sincerely,
Alvan Hathaway

FW: CES-E Comments

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Tue 10/17/2017 11:48 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Tuesday, October 17, 2017 10:43 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: CES-E Comments

From: Sheila Kane
Sent: Tuesday, October 17, 2017 10:43:18 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: CES-E Comments

Martin Suuberg
Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP does not reverse its regulation limiting eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power plant, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim can hardly be considered emissions free. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer when everyone is running their air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we would have ample time to take Pilgrim offline and continue to aggressively develop solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without the potential for devastating hazards.

Thank you for your consideration.

Sincerely,
Sheila Kane
Yarmouth Port, MA

FW: No Clean Energy Credits for Pilgrim Nuclear

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 10/23/2017 8:43 AM

CES and Auction Comments

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

-----Original Message-----
From: Strategies, Climate (DEP)
Sent: Monday, October 23, 2017 6:11 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: No Clean Energy Credits for Pilgrim Nuclear

From: Jan Kubiac
Sent: Monday, October 23, 2017 6:10:56 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: No Clean Energy Credits for Pilgrim Nuclear

Thanks Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing this In addition to the following letter. I would like to add that the many graphs of the trajectory of extreme weather events should give us all a sense of urgency to close the unsafe Pilgrim plant and it's release of 500 million gallons of heated water into the bay daily. We shouldn't think that Pilgrim can safely operate in a major storm, especially a storm whose intensity may be exacerbated by the warming of Cape Cod Bay by The plant itself.
Thank you, Jan

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one´s lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Thank you for your consideration.

Sincerely,

Sent from my iPhone

FW: Keep clean energy credits only for generators 2010 and later

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 10/23/2017 8:42 AM

CES and Auction Comments

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Sunday, October 22, 2017 10:14 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: Keep clean energy credits only for generators 2010 and later

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From: nikos
Sent: Sunday, October 22, 2017 10:14:02 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: Keep clean energy credits only for generators 2010 and later

Martin Suuberg
Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP does not reverse its regulation limiting eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power plant, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim can hardly be considered emissions free. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim received clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue generating electricity, polluting, and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer when everyone is running their air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we would have ample time to take Pilgrim offline and continue to aggressively develop solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without the potential for devastating hazards.

Thank you for your consideration.

Sincerely,

John Nichols

October 25, 2017

Martin Suuberg, Commissioner Mass DEP
100 Cambridge St.
Suite 900
Boston, MA 02114

Dear Commissioner Suuberg,

I am writing to urge that Mass DEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019, because of its terrible track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod Bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. If Pilgrim received clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Sincerely,

Marge Piercy

Marge Piercy
PO Box 1473
Wellfleet, MA 02667

FW: No Nuke Comment

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Mon 10/30/2017 8:44 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Friday, October 27, 2017 4:19 PM
To: Garfinkle, Jordan (DEP)
Subject: FW: No Nuke Comment

From: Lee Roscoe
Sent: Friday, October 27, 2017 4:19:24 PM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: No Nuke Comment

Martin Suuberg, Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

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summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Thank you for your consideration.

Sincerely,

Lee Roscoe

33 D Frederick Ct.

Brewster, MA. 02631

5088963510

Christopher R. Roy

221 Stow Road • Harvard, MA 01451 • (978) 831-3214 • Christopher.Roy@ieee.org

November 28, 2017

Massachusetts Executive Office of Energy and Environmental Affairs
Massachusetts Department of Environmental Protection

RE: 310 CMR 7.75: Clean Energy Standard; Review of Options for Expanding the CES; Stakeholder Discussion

Dear Climate Strategies Team,

Drawing on my professional experience working for both an investor owned utility and a municipal utility, I would like to offer the following input as a private citizen to make implementation of the clean energy standard as successful as possible. In summary the basic philosophy is to preserve the current utility governance structure and leverage the existing policymaking authority of MassDEP.

It has been clear in recent months that different perspectives over who has governing authority over local issues and local utilities has proven to be a challenge for the CES. To resolve this obstacle I propose that the current governance structure be clarified and communicated as simply as possible. In other words, it would be helpful to publicly clarify that the DPU has regulatory authority over investor owned utilities (IOU), Municipal Light Plant Boards/Commissions have regulatory authority over municipal light plants (MLP) and MassDEP has full environmental authority over all entities within the Commonwealth. Rather than targeting individual industries, this approach would set the stage for MassDEP to regulate GHG emissions in Massachusetts as it does all other toxic substances. For example, no entity in the commonwealth (residential, commercial, industrial, municipal etc.) is allowed to dump toxic waste in wetlands per MassDEP regulations so we should translate this same authority to regulating GHG emissions for everyone as well. By including the GHG emissions with all other toxic substances it would preserve MassDEP's broad regulatory authority and place compliance with individual institutions the same way hazardous waste handling is currently structured. This should also eliminate the conflicts with local decision-making or regulatory authority since MassDEP would not be setting the compliance strategy but rather setting the maximum allowable limits.

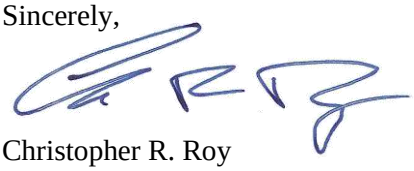
How does this translate to local action? The subsequent policy from MassDEP should specify that GHG emission compliance will incorporate the energy used by consumers. Thus this will put pressure on all governing bodies and regulators of municipalities, MLPs and IOUs to provide non-emitting energy options for their residential, commercial and industrial constituencies. Initial compliance must be achievable by all consumers through their electric and gas consumption alone. Ultimate responsibility for compliance should fall to each city and town since they have full control over the power supply portfolio either through a Municipal Light Plant or Community Choice Aggregation (CCA). This would also lend itself to rolling this responsibility and enforcement into existing Natural Resources Commissions that each city and town already has. Also noteworthy is that many municipalities default to the IOU power supply option where compliance must be regulated by the State. Historically this has resulted in much higher rates and much lower commitment to local issues. Moving forward it will be important to support empowerment of cities and towns to take control of their energy and emissions portfolio. This could be

through enhancing the CCA program to allow long term non-emitting contracts or the formation of new MLPs. It will certainly be important to assure immediate IOU compliance but their business structure continues to cost Massachusetts citizens and business millions of dollars each year through rates well above MLPs and CCAs. This will make any additional compliance costs much more difficult to add to consumer bills likely slowing the transition to CES compliance. One model worth exploring is the Concord Municipal Light Plant where their recent energy procurement strategy will provide Concord citizens and businesses 100% non-emitting electricity by 2021 at a price equal to or lower than current Massachusetts IOUs today. This lays the foundation for a transition from fossil fueled heating and transportation to non-emitting electric equivalents and further progress toward matching the GWSA goals.

In conclusion this approach will remove the MassDEP from localized strategy and decision-making and preserve their broad scope of environmental protection over all members of the Commonwealth.

I look forward to any further opportunities to discuss this topic with the climate strategies team and to add additional detail to my proposed approach. Please do not hesitate to contact me at 978-831-3214 or by email at Christopher.Roy@ieee.org.

Sincerely,



Christopher R. Roy

FW: no clean energy credits to old nuclear plant, Pilgrim

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Wed 10/25/2017 11:32 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

From: Strategies, Climate (DEP)
Sent: Wednesday, October 25, 2017 10:34 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: no clean energy credits to old nuclear plant, Pilgrim

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From: Shira
Sent: Wednesday, October 25, 2017 10:33:36 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: no clean energy credits to old nuclear plant, Pilgrim

Martin Suuberg, Commissioiner Mass DEP100 Cambridge St., Suite 900, Boston,MA 02114

Dear Commissioner Suuberg,

I am writing to urge that MassDEP not reverse its regulation which limits eligibility for clean energy credits only to

newer generators. Massachusetts has one nuclear power station, Pilgrim, which should not be allowed to continue

operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim cannot be considered emissions free; it emits dozens of radionuclides daily, and there is no safe dose of radiation. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas. And if Pilgrim were to receive clean energy credits, they could sell the credits to coal, oil and gas powered generators, allowing them to continue emitting greenhouse gasses and thereby defeating the purpose of the CES.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer with maximum use of air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we need not prop up polluting technologies in order to take Pilgrim offline and continue the development of solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without heating Cape Cod Bay or the potential for devastating hazards.

Thank you for your consideration.

Sincerely,

Shira Sands

Wellfleet, Ma.

FW: CES-E Comments

Garfinkle, Jordan (DEP) <jordan.garfinkle@state.ma.us>

Tue 10/17/2017 11:48 AM

To: Opatovsky, Danielle <Danielle.Opatovsky@icf.com>; Segal, Katie <Katie.Segal@icf.com>;

-----Original Message-----
From: Strategies, Climate (DEP)
Sent: Tuesday, October 17, 2017 10:53 AM
To: Garfinkle, Jordan (DEP)
Subject: FW: CES-E Comments

From: Donald Segal
Sent: Tuesday, October 17, 2017 10:52:56 AM (UTC-05:00) Eastern Time (US & Canada)
To: Strategies, Climate (DEP)
Subject: CES-E Comments

Martin Suuberg
Commissioner MassDEP

Dear Commissioner Suuberg,

I am writing to urge that MassDEP does not reverse its regulation limiting eligibility for clean energy credits only to newer generators. Massachusetts has one nuclear power plant, Pilgrim, which should not be allowed to continue operation beyond June 1, 2019 because of its frankly abysmal track record of mechanical failures and safety violations. Pilgrim can hardly be considered emissions free. The goal of the CES is to slow the rate of global warming. In this light, Pilgrim is a huge violator due to the nearly 500 million gallons of heated sea water it dumps into Cape Cod bay every day. Additionally, the mining, refinement and transport of the nuclear fuel used by Pilgrim does generate considerable greenhouse gas.

Massachusetts is part of ISO New England, and there is enough excess power in the New England power grid so we do not need Pilgrim's power, even on the hottest day of the summer when everyone is running their air conditioning. When Pilgrim goes down, which it does all too frequently, no one's lights go out. In other words, we would have ample time to take Pilgrim offline and continue to aggressively develop solar, wind, hydro, and tidal energy sources, which are truly green and sustainable without the potential for devastating hazards.

Thank you for your consideration.

Sincerely,
Donald Segal
Sent from my iPad