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By email to Thomas.Ferguson@mass.gov

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Subject: **83E Round 1 Comments**

Mr. Ferguson:

On February 21, 2025, the Massachusetts Department of Energy Resources ("DOER"), the Massachusetts Electric Distribution Companies ("EDCs"), and the Attorney General's Office ("AGO") (collectively "RFP Drafting Parties") issued a request for public comments on a first-round solicitation for mid-duration energy storage projects under Section 83E ("83E Round 1"). FirstLight Power ("FirstLight") appreciates the opportunity to submit these comments on 83E Round 1. FirstLight owns and operates existing pumped-hydro projects and is developing new energy storage systems in the Commonwealth.

Comments

FirstLight lauds the RFP Drafting Parties for pursuing a procurement of energy storage. A well-crafted procurement can deliver significant benefits and contribute to meeting the Commonwealth's clean energy and affordability goals. The benefits energy storage provides or could provide to consumers are not fully captured in current markets. This procurement should be aimed at incentivizing the operation of energy storage resources to better utilize their full capabilities to advance the Commonwealth's goals.

Energy storage, particularly existing pumped hydro storage, currently provides the region with substantial benefits, improving clean reliability and flexibility in the system. However, it does so based on market pricing and revenues in the ISO New England (ISO-NE) wholesale electric markets that are not targeted at achieving clean energy goals or reducing carbon emissions. While Massachusetts has made some progress toward achieving the Commonwealth's 2050 net zero mandate, more progress could be made by leveraging existing and new storage resources through the planned energy storage procurement.

ISO-NE operates the wholesale electric markets using bid-based economic energy dispatch. Its objective is to achieve the least production cost of energy schedules. It is agnostic to fuel type, meaning it does

not weight clean energy attributes in determining when resources are called upon. While consumers in the Commonwealth receive some benefits from the operation of energy storage under that fuel-agnostic market design, consumers are not getting the full extent of benefits that existing and new energy storage resources could provide if they were incentivized to deliver additional clean energy value.

Under the economic incentives of these ISO-NE markets, resources like the Northfield Mountain pumped hydro storage facility provide benefits but their ability to contribute to meeting the Commonwealth's clean energy objectives is substantially underutilized. For instance, Northfield Mountain is currently dispatched at approximately 25% of its overall throughput capability on an annual basis, meaning it could do far more to reduce the carbon intensity of Massachusetts's electric supply. Procurement arrangements that incentivize operation of storage resources to advance the Commonwealth's objectives to increase clean energy content could leverage this latent capability to deliver benefits to consumers and maintain affordable electricity prices.

For example, in some high-price hours, energy storage resources may not be incentivized to operate because the energy price in the market does not cover the cost to replace the stored energy that would be used or otherwise cover the lost opportunity of selling that stored energy in other hours. A carbon-intensive resource may be called on instead based on a small difference in price offers because the value of displacing dirtier generation in such an hour is not reflected in the wholesale energy price.

An explicit compensation provided through the forthcoming solicitation that is aligned with the Commonwealth's objectives could overcome these circumstances and support shifting away from carbon-intensive resources during such hours. Similarly, the ability to charge storage using very low or even negatively priced energy (e.g., high PV output periods) is only possible if the physical storage inventory level leaves sufficient headroom to seize those opportunities. But resources will not leave headroom to capture these opportunities if there is a financial penalty to doing so that is not balanced by potential benefit. From the perspective of the Commonwealth's consumers, more value can be captured through better coordination of existing storage resource operation and the Commonwealth's clean energy and affordability objectives.

A procurement under Section 83E could capture the savings possible from greater utilization of existing storage while simultaneously encouraging the buildout of new storage resources. Additionally, the ability to capture excess renewable energy and store it for future peak periods will be critical to meeting climate goals, and ensuring strong renewables contributions like solar and offshore wind are either not curtailed or otherwise do not increase the Massachusetts' program costs. As the electric grid shifts more toward renewable energy each year, energy storage resources, and their efficient utilization, will become an even more critical component to ensuring reliability and affordability.

The underutilization of existing storage assets is well known. A2019 study from UMass Lowell, "The State of Grid Energy Storage in Massachusetts," identified that existing pumped hydro storage is underutilized,[1], and that remains true today. The underutilized capability of storage resources could be captured by contract terms in the forthcoming solicitation that incentivize additional electric storage

[1] Maria Fonseca-Guzman, Zachary Traverso, Ertan Agar, Christopher Niezrecki, Hunter Mack, Aaron Smith-Walter, *The State of Grid Energy Storage in Massachusetts* (December 2019), 14.

throughput where the savings to consumers exceed the marginal cost of storing (i.e., charging) and releasing (i.e., discharging) energy.

The available savings are significant. A study published by Energyzt, LLC in June 2020 (included below) concluded that operating just two of Northfield Mountain's four units more frequently would produce more than $410 million in consumer savings between 2022 and 2030.[2] Additionally the same regimen would reduce carbon emissions by an average of 180,000 metric tonnes annually.[3] These values account for only a portion of Northfield's potential and do not account for an increased use of the other existing energy storage facilities located in New England. With more than 1,800 MW of installed energy storage capacity that is similarly underutilized, the potential value for optimization is compelling.[4]

Better utilization of existing and new storage resources are also going to be critical to achieving a decarbonized economy. New storage technologies are becoming more and more viable each year. Existing and new energy storage resources can be particularly valuable in displacing generation at older fossil peaking facilities, which are not only some of the dirtiest and most expensive resources in the New England fleet but are also often located in disadvantaged communities. Offsetting the need for operation of the region's dirtiest fossil peaking facilities, which often account for a disproportionate amount of regional carbon emissions despite their infrequent dispatch, is critical to achieving Massachusetts' ambitious climate goals.

Forthcoming procurements should include opportunities for existing storage resources. As described above, even though these resources are in place, they lack incentives for optimal operation in conjunction with the Commonwealth's clean energy goals. This makes them low-hanging fruit for achieving significant benefits in an affordable manner. Further, new resources face well-known challenges associated with siting, permitting, and interconnecting new infrastructure in Massachusetts. Existing resources can be available immediately if the right incentives are provided, while new resources come with permitting and timeline risk.

Responses

1) Procurement Schedule:

Section 83E requires that 1,500 MW of energy storage be procured by July 31, 2025. To the extent achieving this timeline is not possible, the RFP Drafting Parties should make every effort to issue and execute on a solicitation as expeditiously as possible. Falling behind on the Section 83E schedule at the start could cause a chain reaction and foil the purpose of the statute, which calls for annual procurements to be concluded by July every year from 2025 through 2027. As described above, the potential benefits of a solicitation are significant, and delaying implementation of the statue has costs to consumers.

2) Environmental Attributes:

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[2] Energyzt, LLC, *Northfield Mountain Pumped Storage: Assessment of Contract Benefits in an Increasingly Renewable Region* (June 2020), 35.

[3] Ibid. 34.

[4] Maria Fonseca-Guzman, Zachary Traverso, Ertan Agar, Christopher Niezrecki, Hunter Mack, Aaron Smith-Walter, *The State of Grid Energy Storage in Massachusetts* (December 2019)

In accordance with the express language of the statute, "existing energy storage systems shall be eligible to participate in any procurement issued under this section." Accordingly, it is critical that the design of each solicitation enable the participation of existing storage resources, including those that do not qualify for Clean Peak Energy Certificates (CPECs). These resources can provide substantial value to the Commonwealth and its ratepayers—indeed the same type of benefits that are recognized through CPECS—if they are incentivized to do so through a Section 83E procurement. Increasing the utilization of these resources through contractual terms will assist Massachusetts in its efforts to reduce carbon emissions in the most cost-effective manner.

Under current law, Massachusetts recognizes environmental attributes produced by only certain energy storage facilities with CPECs. However, most existing energy storage systems are not eligible to qualify for the Clean Peak Standard (CPS), even if they provide the same benefits of displacing carbon-intensive electricity supply during peak periods, due to vintage constraints present in the legislation that established the Clean Peak Standard (An Act to Advance Clean Energy, St. 2018, c. 227), a constraint intentionally omitted from the legislation prompting the enactment of the 83e legislation.[5]

Given the statutory constraints on the CPS, DOER may consider alternative options for environmental attributes. A CPEC-like attribute otherwise representing the same attributes as CPECs but excluding eligibility restrictions based on the timing of the facility's first commercial operations could be considered for existing resources under this procurement alone, avoiding direct impacts on the CPEC market given the substantial size of existing resources. That is, while existing storage facilities that do not meet CPS eligibility requirements because they began operating before 2019 do not generate CPECs under the CPS, they can perform the same functions and provide the same operational benefits, thus creating the same environmental benefit or "environmental attribute." That benefit or attribute is not currently recognized in a state-sanctioned certificate that can be traded for value, but is not different in nature.

The forthcoming solicitation could recognize and procure this "environmental attribute" even if it is not recognized through minting of a CPEC. An example would be through a specific subset of the Midwest Renewable Energy Tracking System's (M-RETS) Alternative Energy Credit (AEC). M-RETS supports Alternative Energy Certificates (AEC) to track generation (MWh) from approved sources of clean energy resources that are not otherwise eligible for renewable energy credits under state programs . AECs have been approved by the M-RETS Administrator as having an environmental benefit that should be tracked in M-RETS despite not being considered as a renewable source (e.g., Pumped Hydro) in many jurisdictions. The forthcoming solicitation could include these AECs.

3) Clean Peak Qualification:

Barriers do exist for energy storage assets to participate in the Clean Peak Standard. The program provides vintage limitation on electric storage resources that can qualify for the Clean Peak Standard. Electric storage resources that achieved commercial operation before January 1, 2019 are excluded from

[5] The constraints present in the original CPS legislation were likely driven, at least in part, out of concern that inclusion of existing energy storage resources might overwhelm the level of demand for CPECs, diluting the intended price signals. The same concern is not present in the proposed procurement. For example, the procurement could require the same level of performance required of existing storage resources in return for CPEC-like compensation that newer storage resources currently get through CPECs.

qualification as a CPS resource. As FirstLight understands it, part of the reasoning for that initial exclusion was to prevent a dilution of value offered to new energy storage resources through CPECs. The proposed RFP offers the Commonwealth an opportunity to get additional value for ratepayers from the electric storage capability excluded from CPS (but not excluded from 83e legislation) without adversely impacting CPECs. The operation of the CPS-excluded resources in the clean peak hours similarly offers the opportunity to reduce electricity prices for Massachusetts consumers while reducing the need for fossil-fired peaking generation. Moreover, existing resources can likely provide the same benefits to consumers at lower cost than new resources: providing a cost effective means for the Commonwealth to advance its clean energy and affordability goals. Consumers lose out if resources that could otherwise provide the same benefit are excluded from a competitive solicitation simply because they began operating prior to 2019.

The legislation authorizing the solicitation presents the opportunity for the Commonwealth to seize the value of pre-2019 energy storage resources by contracting for services similar to what is valued by the CPS.

4) Eligible Bids:

All electric storage technologies should be eligible to bid into the RFP without minimum or maximum bid sizes.

There should be sufficient flexibility in the periodicity of minimum CPEC (or as stated above, CPEC equivalent service) to accommodate resource forced outages, transmission outages and unforeseen system conditions that may warrant a departure from the planned charge/discharge schedule. However, the discharge schedule, consistent with the intent of the CPS/CPEC program should be designed to deliver the greatest energy price and emissions savings for consumers.

Beyond hard-wired minimum delivery requirements from the specific contracted resource, an alternative method of encouraging performance could be a requirement to provide replacement CPEC (or CPEC-equivalent) service. That is, the contracted resource would need to contract the replacement service to honor the contract it has with the Commonwealth and its consumers if it fails to deliver itself.

FirstLight recommends stronger maturity requirements to mitigate the risk associated with the high attrition rates for storage projects (even for contracted projects). There should be no maximum maturity requirements given the statutory requirement that allows for the inclusion of existing resources in all procurements.

5) Facilitating the Financing of Projects:

The RFP should presume that contracts with existing projects facilitate the financing of energy storage systems. Existing projects often have ongoing financing arrangements that were set up to support initial construction or acquisition, and support ongoing operations and maintenance of the facility, including capital reinvestment. Projects with contracted revenues will generally be able to secure lower interest rates and more attractive financing terms than those without contracted revenues. Existing debt arrangements which later receive contracted revenues may be able to refinance that debt with more favorable terms, reducing the cost to ratepayers. As a result, contracts with existing projects resulting from this solicitation would facilitate financing for the continued operations of and improvements to the

project. Further, the procurement will provide financial support to allow existing projects to change their operations to deliver or maximize the procured services.

How a project's participation in the ISO-NE market affects its bid. Please specifically comment on how any ISO-NE operational obligations will impact the creation of CPECs.

Whether it is new or existing electric storage, participation in the ISO-NE market does affect a project's bid. The creation of CPECs (or CPEC-equivalent service) relies on the ability to achieve sufficient state of charge to support the expected operational schedule to reach the desired CPEC (or CPEC-equivalent service) level and the ability to convert that storage into generation (storage discharge) in the desired hours. Charging of grid-connected electric storage is subject to ISO-NE dispatch decisions, which include the ability to interrupt charging load as necessary to avoid adverse reliability situations, which could include local transmission limitations when local transmission facilities are taken out of service for maintenance. Resources with more stored energy relative to their contracted output (i.e., storage duration) are better positioned to deliver their expected discharge schedule in the CPEC (or CPEC-equivalent service) hours than those with less storage duration.

Further, in real-time operation, under Section III.1.10.3 of the ISO-NE market rules, Fast Start resources (i.e., resources that can achieve output from an offline state in 10 or 30 minutes and whose minimum run time is no greater than 60 minutes) are permitted to request self-commitment. This provides certainty on the real-time scheduling up to the resource's Economic Minimum Limit ("EcoMin"). Inverter-based battery energy storage resources are considered as synchronized to the grid in all real-time intervals (unless on outage) and effectively have an EcoMin of zero. They would need to bid their energy low enough for the ISO-NE to dispatch them in the Real-Time Scheduling, Pricing and Dispatch (RT-SPD) model or otherwise request intra-day self-scheduling under Section III.10.9(f) of the ISO-NE market rules. Under Section III.1.10.9(f), "the Market Participant may request that a Generator Asset be dispatched above its Economic Minimum Limit at a specified output. The ISO will honor the request so long as it will not cause or worsen a reliability constraint. If the ISO is able to honor the request, the Generator Asset will be dispatched as though it had offered the specified output for the hour in question at the Energy Offer Floor."

This generally should permit self-scheduled pumped storage or BESS operation, subject to its potential for impact on a reliability constraint. If the set of performance hours under the contract are designed appropriately, adapt to changing grid conditions and assuming location of the pumped storage or BESS at a point with good transmission delivery, the Energy Offer Floor price aspect of the provision should not present meaningful risk to the pumped storage or BESS seller for such operation.

Here too, encouraging performance while permitting (or more aptly, requiring) replacement CPEC or CPEC-equivalent service can assure consumers get what has been contracted on their behalf even where such self-scheduling request might require procurement of replacement service.

How a project and potential awarded contract will contribute to short- and long-term affordability for ratepayers in the Commonwealth.

In the short term, a resource awarded a contract for CPEC (or CPEC-equivalent service) is contracted to provide electric storage discharge of energy at the strategic times of day specified in the contract or as coordinated with the respective EDCs to displace more expensive fossil-fired generation. Achieving

certainty of delivery in those periods will require the electric storage facility to either request self-commitment (a zero priced block of energy) or bid their energy price low enough to provide the energy throughout the hour (a sub-marginal price of energy). In both cases, the consumers receive less fossil-fired generation in the peak hours and lower energy prices (or, in the case of charging/pumping, mitigating the Massachusetts program costs that might be increased by deeply negative wholesale energy prices). That is, the insertion of zero or lower priced energy changes the marginal energy supply curve to yield a lower marginal energy price at the respective real-time loads than would otherwise occur absent the contract award. The contract award price would essentially provide the premium to cover the lowered energy dispatch price needed to assure CPEC (or CPEC-equivalent) service. This is true for both new and existing electric storage facilities.

6) Commercial Operation Date:

If the contracted award requires the resource, if not yet commercial by the start of the contract, to themselves contract for replacement supply, there is no need for a cutoff commercial operation date. Consumers get what they contracted, at the price they contracted it, and the burden is appropriately placed on the contract seller. Including CPEC-equivalent service from resources left outside the CPS would increase the supply of eligible replacement supply. As ISO-NE's Forward Capacity Market design has revealed, it is incredibly difficult for third parties to accurately evaluate critical milestone progress. That is, it is challenging to evaluate how close a project is to being commercial, until it has achieved commercial operation. All existing storage should be eligible for contract.

7) Resource Types:

This procurement should allow for both transmission and distribution connected resources.

8) Contract Length and Form:

The contract length, for a period of up to 30 years, that should be considered under Section 83E Round 1 and associated reasoning, including how the contract term will facilitate the financing of the project, how the term aligns with useful life, augmentation schedules, etc.

As noted above, financing terms are generally more favorable for those with contracted revenues, and longer contract terms that are more consistent with the useful life enable better financing terms and lower costs to ratepayers. Shorter contract terms will be harder and more expensive to finance as they introduce risk, which will then be priced into the financing terms. As a result, the best pricing will be obtained with longer contract terms.

Given the degradation of battery performance over time, how contractual provisions for operational security should be constructed to assure optimal/maximum performance for the duration of the contract.

While lithium ion BESS does face degradation in battery cell performance over time, pumped storage hydro generally maintains a stable capability to provide its electric storage performance with normal equipment maintenance (i.e., standard maintenance of individual parts with periodic need to refurbish or replace specific components versus outright replacement of the entire energy storage vessel and equipment to convert to/from stored energy). If the contract seller is obligated to buy replacement CPEC (or CPEC equivalent as recommended above) service, the most cost effective decision will be made

by the contract seller to either replace battery cells (in the case of BESS) or contract with a third party to deliver the service. In both cases, consumers get what they contracted, at the price they contracted it.

9. Safety:

Safety protocols should be included as a minimum baseline in accordance with federal, state, and local guidelines and best practices associated with the technologies imposed.

10. Project Viability and Other Qualitative Factors:

Outside factors such as federal tariffs, supply chain disruptions, and limitations on manufacturing may impact new storage development. Existing resources, such as pumped hydro storage, are not subject to project viability risks.

11. Grid Resiliency and Transmission Needs:

Bids should receive points under the qualitative scoring criteria for benefits associated with grid reliability and resiliency.

12. Economic Development, Workforce, and Diversity, Equity & Inclusion (DEI):

Bids should receive points under the qualitative scoring criteria for benefits associated with DEI, workforce, and economic development benefits.

13. Environmental Justice:

Bids should receive points under the qualitative scoring criteria for benefits associated with environmental justice benefits, particularly the bidder's ability to displace fossil peaking generation.

14. Energy Storage Industry:

No comments at this time.

15. Future RFPs:

Contractual arrangements leveraging storage for energy services, including existing storage resources, will help offset the need for additional fossil peaking dispatch as described above, particularly during periods of winter seasonal natural gas constraints, and dispatch of storage to further improve affordability. For example, contractual arrangements for energy services will also assist with reducing consumer costs on the non-supply side of the bill by balancing the benefits of lower spot electricity market prices to the supply side of ratepayer bills with benefits of avoiding larger increases in the delivery side of electric bills (e.g., storing energy to avoid deeply negative spot energy prices that increase the cost of state incentives for offshore wind procurements, net energy billing for behind-the-meter solar, etc.). During periods of high concentrations of net-metered solar production, producers receive retail rate credits for the energy provided in hour X toward customer electric consumption in hour Y regardless of wholesale real-time hourly market rates. For example, during periods of high solar production real-time prices may reflect negative hourly pricing in the wholesale electric market (i.e., too much supply relative to demand). Storage, particularly large-scale storage, if properly incentivized for these supra-market objectives, can absorb the excess electricity, moderate the system-wide congestion

and thereby help to lower the additional costs associated with such market disconnect (i.e., better converge hour X and hour Y prices in the example above).

16. Other:

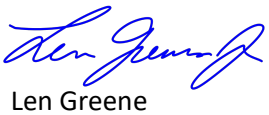
a. Any additional comments that you believe should be known by or would be helpful to the RFP drafting team.

No comments at this time.

Conclusion

Thank you for your consideration of FirstLight's recommendations and comments on the Section 83E procurements. We believe that these procurements will help to ensure that Massachusetts can meet its climate change goals into the future.

Sincerely,



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