

January 31, 2024

Tom Ferguson, Energy Storage Programs Manager
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Subject: FirstLight Comments on “Charging Forward: Energy Storage in a Net Zero Commonwealth”

Mr. Ferguson:

Section 80 of Chapter 179 of the Acts of 2022 (the “Act”) required the Department of Energy Resources (DOER), in consultation with the Massachusetts Clean Energy Center (CEC), to “conduct a study (i) how to optimize the cost-effective deployment and utilization of both new and existing mid-duration and long-duration energy storage systems”¹. FirstLight is submitting these comments in response to the study “Charging Forward: Energy Storage in a Net Zero Commonwealth”, prepared by Energy and Environmental Economics, Inc. (“E3”) and the subsequent report of DOER and MassCEC to the legislature in accordance with the statute.

The critical issue facing Massachusetts is not whether procuring existing and new mid- and long-duration storage will benefit the Commonwealth, it is in fact a question of timing. When will such procurements provide value to ratepayers and when will such procurements help Massachusetts decarbonize the grid. FirstLight contends that the study, which did provide multiple use cases for short-, mid-, and long-duration storage, failed to address critical aspects of the issues facing new developments and in optimizing the usage of existing resources.

Existing Storage

The law affords DOER with the authority to procure energy both new and existing mid- and long-duration energy storage in accordance with the study results. However, the study did not adequately examine “how to optimize the cost-effective deployment and utilization of both new and existing mid-duration and long-duration energy storage systems” as was mandated by the statute. The focus of the study conducted by E3 centered on deployment of new systems in accordance with the statutory requirements, but failed to examine how best to deploy existing storage that is currently underutilized² under current market structures.

As FirstLight pointed out in our previous submission in response to the second stakeholder session held in August 2023, “The core question of this study is to what extent the inclusion of flexible and responsive resources like mid- and long-duration storage under contractual arrangements maximizing the benefit for Massachusetts’ consumers will allow the power system to decarbonize in a more cost- effective way and what procurement requirements DOER should establish for mid and long-duration storage to contribute to greenhouse gas emission limits, promote

¹ Mass. Gen. Laws ch. 179, § 80.

² Fonseca-Guzman, M., Traverso, Z., Agar, E., Niezrecki, C., Mack, H., Smith-Walter, A. (December 2019) *The State of Grid Energy Storage in Massachusetts*, UMass Lowell and AIM Foundation, p. 14



offshore wind energy and other renewables, transport energy from periods of low energy demand to high energy demand and enhance reliability at the minimum ratepayer cost.”³

UMass Lowell cited the very real issue that existing pumped hydro storage is underutilized in their 2019 study “The State of Grid Energy Storage in Massachusetts”, which unfortunately stands true today. For example, under current energy market signals the operation of Northfield Mountain Pumped Storage facility (NMPS), Massachusetts’ largest existing source of energy storage, the result is an underutilization where approximately 75% more storage throughput is possible.

This could be captured by contract terms that incentivize additional electric storage throughput where the savings to consumers exceed the cost of supplying the service. Under existing market rules, the reliance on energy arbitrage pricing often places electric storage at the energy market margin during discharge. Contractual arrangements that meet round-trip electric costs could decrease the marginal cost of electricity during electric storage discharge periods.

The benefits of such an arrangement would be twofold:

1. Integrating large quantities of intermittent renewable generation such as offshore wind. As the study points out: “Fast-responding forms of energy storage can smooth the output of this resource, minimize curtailment, and ensure that clean generation is shifted to periods of peak energy demands. This energy-shifting value is likely to be particularly important in Massachusetts as the state pursues 5.6 GW of offshore wind by 2027, and significantly higher amounts by mid-century.”⁴
2. Reducing “the state’s reliance on “peaker” plants. Peaker plants operate infrequently but provide critical support during hours with the highest customer demand, often at the cost of high amounts of greenhouse gas emissions. In addition to the greenhouse gas benefits, the ability of storage to displace peaker plant generation will create equally and sometimes more valuable local air quality benefits, associated with reductions in particulate matter and its precursors.”⁵

Importantly existing storage can immediately help the Commonwealth without the need to site new developments. It is widely known that there are very real barriers to siting and interconnecting new facilities, which is likely to continue to hinder the buildout of new energy storage in a timely fashion, making it more important that Massachusetts make effective use of our existing facilities. Absent contractual arrangements the existing facilities will continue to operate as they currently do and will continue to be an underutilized source of storage, primarily leveraging financial arbitrage opportunities not directly tied to benefits such as carbon reduction, renewable integration, offsetting of curtailment, and more.

The report fails to mention any potential benefits related to the better optimization and usage of existing storage resources such as pumped hydro storage. The report does not provide an examination of this point, instead pointing out concerns raised by environmental groups without any explanation as to how the study views the future of these resources.

³ FirstLight Power (September 1, 2023) *FirstLight Power Comments: Massachusetts 2022-2023 Energy Storage Study Stakeholder Session Two*, p. 7

⁴ Mettetal, L., DeBenedictis, A., Grady, N., Li, R., de Vasconcellos Oporto, P., Greszczuk, S., Gulian, C., Patel, K., (December 31, 2023) *Charging Forward: Energy Storage in a Net Zero Commonwealth*, Energy and Environmental Economics, Inc., p. 82

⁵ Ibid



It must be noted that NMPS is currently approaching the end stages of an extensive relicensing process and will be subject to state and federal license requirements designed to protect the natural lands and mitigate environmental impacts.

It must also be noted that the other large-scale pumped hydro station located in Massachusetts, Bear Swamp, was recently awarded a new decades long license and will continue to operate under specific conditions designed to mitigate environmental impacts in accordance with state and federal license requirements.

The concerns raised by the environmental groups are and will be largely addressed under these license requirements in both cases. The value that these resources can and do provide to the electric grid should not be ignored when considering energy storage policy initiatives.

Additionally, environmental impacts of any resource must be taken into account, but the report did not include environmental impacts of other technologies, focusing specifically on pumped hydro storage. If such considerations are to be included in the final evaluation of potential policy recommendations, then DOER should account for these issues across all new and existing technologies and provide a full examination of the potential environmental impacts, the real world mitigation of these impacts, and the overall benefits provided by these resources.

New Storage Development

With regard to new storage development FirstLight has concerns over the decision by DOER to simply retain its procurement authority to a later date. The storage study points out numerous benefits that storage can provide, including before 2030, but new storage takes time and financial assurance to develop. Given the current state of siting new developments in Massachusetts and the difficulties associated with them, it can take years to actually build an operational storage facility.

By pushing off the decision to leverage its existing procurement authority DOER is essentially precluding new mid- and long-duration storage from being built within the next several years. We feel that this results in a massive missed opportunity to make progress on the Commonwealth's climate change goals and unfortunately will create additional problems on the grid as more intermittent renewables come online.

Conclusion

We urge DOER to reconsider its decision to reserve its procurement authority to a later date and move forward with a full procurement of both new and existing mid- and long-duration storage. Delaying the procurement carries unnecessary risk for Massachusetts in several areas already mentioned like siting and permitting issues. It is also notable that many states are pursuing ambitious climate goals, and Massachusetts runs the risk of losing new and existing resources to those states prioritizing energy storage, including contract and incentive structures for existing resources.

Such a delay makes even less sense when considering the fact that one of the primary benefits of leveraging existing and new mid- and long-duration storage is to offset dirty peakers, many of which are located within environmental justice communities or within a few mile radius of large population centers.⁶ This procurement is essential to capturing the full value of existing assets and contracted large-scale renewables such as offshore wind,

⁶ Elena Krieger, PhD Ana McPhail, PhD Rachel Blythe, MPH (May 2020) *Massachusetts Peaker Power Plants Energy Storage Replacement Opportunities*, PSE Healthy Energy <https://www.psehealthyenergy.org/wp-content/uploads/2019/12/Massachusetts.pdf>



in addition to actually building new storage assets that are going to be critical to maintaining a clean grid into the future.

About FirstLight

FirstLight is a leading clean power producer, developer, and energy storage company serving North America. With a diversified portfolio that includes over 1.7 GW of operating renewable energy and energy storage technologies and a development pipeline with 4,000+ MW of solar, battery, onshore wind, and offshore wind projects, FirstLight specializes in hybrid solutions that pair hydroelectric, pumped-hydro storage, utility-scale solar, large-scale battery, and offshore wind assets.

Our mission and vision is to accelerate the decarbonization of the electric grid by owning, operating, and integrating large-scale renewable energy and storage assets to meet the region's growing clean energy needs and to deliver an electric system that is clean, reliable, affordable, and equitable.

FirstLight's clean energy 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 clean energy generation facilities, we also own and operate the 1168 MW Northfield Mountain pumped hydro storage station and 29 MW Rocky River pumped hydro storage station, respectively the largest and third largest energy storage facilities in New England. Our facilities represent over a billion dollars of private investment in the region, employ more than 200 people, and support our communities in Massachusetts with more than \$15 million in local property taxes every year.

Thank you for your time and consideration of our comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Len Greene".

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