

Via Electronic Filing

November 10, 2022

Patrick Woodcock, Commissioner
Department of Energy Resources
100 Cambridge Street
Boston, MA 02110

Jennifer Daloisio, CEO
Massachusetts Clean Energy Center
294 Washington St., Suite 1150
Boston, MA 02108

Re: Solicitation for a Study of Mid and Long Duration Energy Storage

Dear Commissioner Woodcock and CEO Daloisio,

The Northeast Clean Energy Council (“NECEC”) appreciates the opportunity to provide comments regarding the Mid and Long Duration Energy Storage (“M/LDES”) study to be conducted by the Massachusetts Department of Energy Resources (“DOER”) and Massachusetts Clean Energy Center (“MassCEC”). The study, as mandated, presents an opportunity to make informed decisions on how M/LDES can pave the path to a renewable future in Massachusetts.

NECEC is a clean energy business, policy, and innovation organization whose mission is to lead the just, equitable and rapid transition to a clean energy future and diverse climate economy. NECEC is the only organization in the Northeast that covers all of the clean energy market segments, representing the business perspectives of investors and clean energy companies across every stage of development. NECEC members span the broad spectrum of the clean energy industry, including clean transportation, energy efficiency, wind, solar, energy storage, microgrids, fuel cells, and advanced and “smart” technologies.

In June of 2022, Massachusetts established a sector goal of reducing emission related to energy generation by 70% from 1990 levels by 2030.¹ Based on provided data in the Clean Energy and

¹ Massachusetts Executive Office of Energy and Environmental Affairs, “Determination of Statewide Greenhouse Gas Emissions Limits and Sector-Specific Sublimits For 2025 And 2030”
www.mass.gov/doc/2025-and-2030-ghg-emissions-limit-letter-of-determination/download

Climate Plan for 2025/2030,² the Commonwealth still needs to reduce its emissions in this sector by 35% between 2020 and 2030 (12.9 MMTCO₂e to 8.4 MMTCO₂e)³. Though the state has already made significant progress, it must actively deploy a combination of new and existing technologies to achieve the 2030 target. The 2025/2030 Clean Energy and Climate Plan recognizes the need to make significant progress in the deployment of renewable energy and recognizes a need for “complementary technologies” that balance production and demand cycles.

Both Governor Baker’s Administration and the legislature recognize the important role that M/LDES can play in the clean energy transition by including this study in the recently enacted “Act Driving Clean Energy and Offshore Wind.” NECEC wholeheartedly supports a broad and thorough investigation into the myriad ways that medium and long duration energy storage deployment can enable the Commonwealth to achieve its 2030 targets and beyond. Medium and long duration storage resources not only represent a key component to the clean energy transition, but also provide key opportunities for Massachusetts to reap economic development benefits, job growth, and competitive advantages in the clean energy economy. Below please find specific recommendations and comments related to the pending study solicitation.

SUMMARY

To conduct an effective study, it will be important to be thoughtful in both its structure and contents. NECEC supports the following considerations:

1. Sourcing knowledge: build on past research
2. Timing: set a more ambitious timeline for implementation of M/LDES than mandated
3. Technology: Maintain a technology-neutral approach, where applicable
4. Identify usage scenarios where M/LDES will provide the greatest value
5. Make M/LDES goals that complement renewable development
6. Consider the role of incentives, procurements, targets, and other policy levers to encourage M/LDES development

STUDY STRUCTURE

1. Sourcing Knowledge: Build on Past Research

MassCEC and DOER should leverage existing studies as a basis for this more focused study. To maximize its value, MassCEC and DOER should craft a study that begins with a review of similar studies from across the country, then defines its questions in ways that build on already existing knowledge. The study could expand beyond extant bodies of knowledge to investigate unique regional needs, technological advances, and implementation options not previously studied.

² Table ES.3. “Massachusetts Clean Energy and Climate Plan for 2025 and 2030,” page xiv.
www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download

³ MMTCO₂e - Million metric tons of carbon dioxide equivalent.

By reviewing and incorporating findings from other studies, the study can compare the M/LDES needs and opportunities for Massachusetts with those of California and other states that have similar GHG reduction mandates.^{4, 5} For example, a report in California found that renewable energy goals within the state can only be reached with appropriate investment in storage. Given this finding, the Massachusetts study should expand upon available knowledge and ask more detailed questions regarding the best local approach to implementation and optimal storage goals.

Multiple studies report that M/LDES is a promising tool for turning time- and weather-dependent energy sources, like solar and wind, into stable and demand-responsive solutions.^{6,7} Given that M/LDES includes an emerging set of technologies, the Massachusetts study has an opportunity to fill in knowledge gaps.⁸ For the review of energy storage systems currently in development, the study should provide an overview of which technologies would best suit its current capacities, including geography, locations with greatest need, etc. In this inquiry, MassCEC and DOER should reference studies that analyze M/LDES technologies and work to identify the best options for a given setting and need, including MIT's "The Future of Energy Storage" report.⁹

2. Timing: Set a More Ambitious Timeline for Implementation of M/LDES

Although the Act requires DOER to submit a report and recommendations to the legislature by the end of December 2023, NECEC encourages DOER and MassCEC to move expeditiously with the study and recommendations, if possible.

By condensing its timeline, the Commonwealth could move to the implementation phase sooner, helping Massachusetts advance its goal of a more reliable and resilient grid, and making the state's renewable energy goal a reality. Given the role of Massachusetts as a technology leader in many fields, this will also provide an opportunity for the Commonwealth to demonstrate thought and practice leadership in this emerging space. If appropriate to its goals, the report can also showcase technology companies working in M/LDES that are based in Massachusetts.

3. Technology: Maintain a Technology-Neutral Approach

⁴ "California Releases Report Charting Path to 100 Percent Clean Electricity" 2021.

<https://www.energy.ca.gov/news/2021-03/california-releases-report-charting-path-100-percent-clean-electricity>

⁵ "Massachusetts Gov Baker signs climate legislation, setting net-zero 2050 target." 2021. Utility Dive.

<https://www.utilitydive.com/news/massachusetts-gov-baker-plans-to-sign-sweeping-climate-legislation-setting/592881/>

⁶ "The challenges with long-duration energy storage." 2022. Kelly Ogiesoba, NECEC.

<https://www.necec.org/blog-details/the-challenges-with-long-duration-energy-storage>

⁷ Nate Blair et al. 2022. "Storage Futures Study: Key Learnings for the Coming Decades." 2022. Nate Blair et al, NREL. <https://www.nrel.gov/docs/fy22osti/81779.pdf>

⁸ "Net-zero power: Long-duration energy storage for a renewable grid" 2021. McKinsey & Co.

<https://www.mckinsey.com/capabilities/sustainability/our-insights/net-zero-power-long-duration-energy-storage-for-a-renewable-grid>

⁹ "The Future of Energy Storage" 2022. MIT Energy Initiative. <https://energy.mit.edu/research/future-of-energy-storage/>

As DOER and MassCEC undertake this study, NECEC encourages a broad, performance-based review of M/LDES applications and use cases. Many different M/LDES technologies are being developed to meet the needs of a changing grid and the Commonwealth would be well-served by casting a broad net in this study. The state should be technology neutral, and recommendations should be applicable to all viable technologies that can deliver clean energy benefits to Massachusetts and the region.

Additionally, the study and its recommendations should not feel constrained by the artificial distinction between mid and long-duration but should address all storage that falls within these categories (e.g.: >4 hours of duration). The study should look at how to optimize cost-effective deployment and utilization of mid and long duration energy storage, as required by different use cases.

STUDY CONTENT

In addition to structural planning, NECEC also would like to highlight areas of interest that should be prioritized in the study. Studying the following opportunities will empower the state to find how the technology can be used to maximize resiliency, reliability, and development of M/LDES technologies.

4. Scenarios for Maximized Return on Investment

NECEC encourages DOER and MassCEC to investigate a wide variety of M/LDES use cases and scenarios to identify the full spectrum of applications. While far from exhaustive, the study should examine the use of M/LDES to (a) maximize the utility of offshore wind resources; (b) alleviate load congestion pockets; and (c) improve reliability and cost reductions during winter and summer peaks.

M/LDES can support offshore wind energy, which delivers great amounts of energy during high winds that could be stored and made available during periods of lower generation. The study should seek to identify how these two technologies can work synergistically to maximize the value of future offshore wind projects.¹⁰

In addition, M/LDES could provide a smoother energy delivery system to load congestion pockets: areas whose energy demand lies close to or above grid capacity. The study should seek ways to incorporate M/LDES to serve these load pockets, which would provide greater assurance to energy consumers that they will not lose service when the transmission lines are strained in their area.

The study should also give special attention to how M/LDES will perform and support the energy grid during winter weather and shortened daylight hours. Although winter electricity demand has historically been lower than summer, there is more demand variability, with peaks in the early morning and late afternoon hours. M/LDES could be the on-demand electricity supply to fill these

¹⁰ “Reports & Research” LDES Council, McKinsey, Form Energy. <https://www.ldescouncil.com/insights/>

peak periods, reducing the need for using peaker plants by as much as 83% and curtailing their CO₂ emissions.¹¹

5. Create M/LDES Goals that Complement Renewable Development

A clean energy grid will require a massive change in energy sector systems, and it is unlikely that this future will exist without the wide deployment of M/LDES technologies.¹² The study should aim to define storage goals commensurate with the Commonwealth's clean energy and emissions reduction goals. By doing so, variable renewable energy resources can become part of a reliable base load, rather than only supporting the grid during limited hours.

Storage is a core need in the renewable transition and complements renewable energy in countless ways, including creating a more reliable grid, work opportunities, and possibly even an expanding manufacturing economy in the Commonwealth. The M/LDES study should examine a range of reasonable, but ambitious, storage goals that will support the state's transition to a decarbonized energy grid.

6. Procurements, Compensation, Incentives, and Economic Development

Lastly, the study should also consider policies and programs that will prompt the deployment of M/LDES resources in ways that are consistent with the Commonwealth's targets. We applaud the recognition by Governor Baker and the legislature that procurement strategies are one potential, and perhaps likely, recommendation stemming from this study. NECEC strongly supports the exploration of competitive procurement models in this study.

In addition to procurements, this study should look broadly at policy strategies to stimulate investment in M/LDES deployment that reflect its overall value. Again, casting a wide view of these mechanisms—including direct incentives, rebates, state-level tax credits, and inclusion in existing programs—will serve the overall goals of Massachusetts. By analyzing a creative set of strategies for M/LDES deployment, Massachusetts will pave the way to a more competitive energy market that will allow clean energy development to thrive. As part of this effort, we encourage the study to consider economic development benefits for Massachusetts and the northeast region as part of its scope.

We encourage the study authors to consider a system for making results of this study and any related demonstration projects publicly available. Publishing the study and actively communicating its results will enhance its value and the chances that its recommendations will be implemented.

¹¹ "Solving the Clean Energy and Climate Justice Puzzle." 2020. Form Energy.

https://formenergy.com/wp-content/uploads/2020/08/Form_Energy_NYGasReplaceWhitePaper_V2.pdf

¹² "Long Duration Energy Storage for California's Clean, Reliable Grid" 2020. Strategen.

https://static1.squarespace.com/static/5b96538250a54f9cd7751faa/t/5fcf9815caa95a391e73d053/1607440419530/LDES_CA_12.08.2020.pdf

Conclusion

NECEC appreciates the opportunity to provide comments on the design of the M/LDES study and recommends an accelerated timeline in conjunction with certain areas of special attention to better achieve the state's renewable objectives.

Sincerely,

/s/ Alistair Pim

/s/ Jeremy McDiarmid

Alistair Pim
Vice President, Innovation and Partnerships

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cc: Samantha Meserve, Department of Energy Resources
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