



January 31, 2024

Tom Ferguson, Ph.D.
Energy Storage Programs Manager
Massachusetts Department of Energy Resources
100 Cambridge Street, 9th Floor
Boston, MA 02114
Submitted via email: thomas.ferguson@mass.gov

Form Energy Comments on DOER's *Charging Forward* Report

Dear Dr. Ferguson

Form Energy appreciates the opportunity to comment on the final *Charging Forward: Energy Storage in a Net Zero Commonwealth* Report (the Report) that the Massachusetts Department of Energy Resources (DOER) and the Massachusetts Clean Energy Center (MassCEC) released in compliance with Section 80 of Chapter 179 of the Acts of 2022, *An Act Driving Climate Policy Forward* (the Act). The report is supported by a study of the same name (the Study) conducted for DOER and MassCEC by E3, Inc. These comments focus on the findings and recommendations presented in the report related to long duration energy storage (LDES).

One of the primary purposes of the Study was to inform the design of energy storage procurement programs to help mid- and long-duration energy storage overcome barriers to their deployment and to advance the Commonwealth's progress to achieving a reliable, zero carbon grid. We were encouraged that the results of the Study provide strong evidence about the value of mid- and long-duration storage to achieving these goals and point to the following key conclusions:

- Energy storage supports regional reliability, especially as deployment of renewable resources increases.
- LDES can provide nearly a 1:1 replacement of fossil peakers by 2030, offering both critical grid support and emission reductions in communities where these facilities are located.
- New state procurement or incentive programs are needed to close the gap between the costs of emerging LDES resources and the revenues they can receive from existing state programs and wholesale market services.
- From a reliability standpoint, it is a no-regrets investment to cultivate multi-GW-scale markets of LDES resources by 2030 to advance progress to achieving a reliable zero carbon grid in the long-term

We were disappointed to see that the demonstration of the value of LDES in the Study did not translate into Report recommendations for near term actions that would support adequate commercialization of these technologies in the timeframe in which they will be needed.

DOER recommends reserving its authority to procure MDES and LDES resources because it found “the need is not immediate.” But this runs counter to the findings of significant value and to the many conclusions in the Report that these technologies must be supported now in order to build their commercial availability in a relevant timeframe. For example:

- “The Study demonstrated that the ability of energy storage to provide critical electric grid needs grows over time, meaning that these technologies must be supported now such that when the need arises, there will be commercially deployed, safe, and reliable systems ready to fulfill that need.” Report at 12.
- “...many of these technologies require significant de-risking before commercialization. DOER proposes funding to support these technologies to reach commercial readiness, such that they will be on the grid and ready to provide reliable, safe operation when needed.” Report at 16.

Unfortunately, the funding for LDES Commercialization grants proposed in the Report, while a great idea in concept, is far from enough to support this emerging industry. ***Form recommends that DOER work with MassCEC and the Administration to put forward a more robust LDES Commercialization Grant program as part of the Economic Development Bill that is currently being developed.*** The program could be modeled after California’s programs, which are investing over \$330 million in long duration storage commercialization in the state.

The time to act is now, especially with long lead times for project development due to siting and interconnection challenges. The state cannot wait for these resources to materialize on their own. The near term benefits are significant, and, as the Study itself states: “Given the large anticipated off-shore wind buildout, and the diversity benefits of long-duration storage on a highly renewable grid, the investment in long-duration energy storage at reasonable cost is a no-regrets action for the Commonwealth.” Study at 84.

Form believes that the Report’s recommendation for an interim storage procurement target of 3 GW by 2030 (calculated from the recommendation that the state procure 250 MW per GW of renewable energy anticipated, which is ~12 GW by 2030) is reasonable ***so long as a significant portion of that target is met with MDES and LDES as they provide such important benefits to the region.***

For example, the Report concludes that “[l]ong duration energy storage has the ability to supplant significant quantities of dispatchable, thermal capacity in futures with high renewable deployment.” Report at 13. The Study found that these resources can provide nearly a 1:1 replacement value for up to 10 GW of fossil peaker capacity by 2030. Study at 121. This

suggests a near-term need to deploy these resources in order to reliably reduce emissions, especially in overburdened communities where these peakers are likely to operate.

The Study also concludes that multi-day storage significantly boosts the resource adequacy value of New England's planned offshore wind investments – making offshore wind even more valuable as a reliability asset in addition to being clean, renewable energy. And the Study finds that multi-day storage is essential to maintaining grid reliability in a 2050 net zero future, especially in the winter and during periods of low renewable energy availability.

Unfortunately, the Study did not analyze the benefits of LDES resources on winter reliability needs – a use case that shows tremendous value in the near term for New England. An analysis released by Form Energy in September of 2023 found that deploying 3 GW of multi-day storage in New England by 2030 could avoid winter energy shortages at a cost that is 74% lower than deploying short-duration storage alone.¹ Winter reliability concerns continue to vex state and regional energy planners and temporary solutions have proven costly. ***DOER can start the state on a path to solving these Winter Reliability problems by supporting deployment of LDES now through specific procurements for these technologies.***

Finally, the way the Study modeled LDES (by forcing it into pre-determined portfolios rather than through capacity expansion modeling) fails to capture the optimization value these resources can provide through reduction in overall portfolio buildout. Other studies have shown tremendous cost and land use savings from LDES resources that are not fully captured in the Charging Forward Study. Form's analysis showed that adding 23 GW of LDES in New England by 2050 could help avoid overbuilding 150 GW of new resources, which in turn reduces costs of decarbonization by up to 33%, curbs renewable energy curtailment by 83%, and avoids impacts to hundreds of thousands of acres of land.²

Conclusion

Form appreciates the opportunity to provide these comments and hopes that DOER will consider amending its recommendations to set appropriate interim procurement targets for LDES and to utilize its procurement authority now to ensure these important technologies achieve commercial scale in the timeframe in which they are needed. A robust LDES Commercialization Grant program developed as part of the Administration's Economic Development bill could go a long way toward supporting this emerging industry in Massachusetts.

Sarah Jackson

Policy Manager, Eastern Region

Form Energy

sjackson@formenergy.com

¹ See Form Energy, September 2023: [Clean, Reliable, Affordable: The Value of Multi-Day Storage in New England](#) at 14-18.

² See id. at 7-13.