Conservation
Law Foundation

For a thriving New England

CLF Massachusetts 62 Summer Street
Boston, MA 02110
P: 617.350.0990
F: 617.350.4030
www.clf.org

VIA ELECTRONIC DELIVERY
Thomas Ferguson, Ph.D., Energy Storage Programs Manager
Massachusetts Department of Energy Resources
100 Cambridge Street, 9th Floor
Boston, MA 02114
thomas.ferguson@mass.gov

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Subject: MA Dept. of Energy Resources Storage Study "Charging Forward: Energy Storage in a Net Zero Commonwealth"
Comments of Conservation Law Foundation

Dear Dr. Ferguson,

In response to the Massachusetts Department of Energy Resources' ("MA DOER") request for comments regarding its energy storage report "Charging Forward: Energy Storage in a Net Zero Commonwealth" ("the Report"), please find comments of Conservation Law Foundation ("CLF") below. In general, CLF agrees with the findings set forth in the Report, but we would like to see more aggressive deployment targets and earlier action to procure mid- and long-duration energy storage ("MDES" and "LDES") to help mitigate winter price spikes and winter peak emissions.

Massachusetts' Current Climate Law and Policy Landscape

As Massachusetts moves towards its clean energy future, battery storage will play a significant role in ensuring a reliable electric grid. Achievement of Massachusetts net-zero greenhouse gas emissions mandate requires a transition to electrification and conversion of our electric power supply to clean generating resources. As wind and solar energy generation are non-dispatchable resources which rely on resources beyond our control, battery storage is needed to fill in the gaps when these resources are not available. Storage technologies are rapidly changing, incorporating more readily available materials and lowering the costs of production and operation.

In recent years, Massachusetts climate law and policy has been strengthened significantly. In March 2021, the Global Warming Solutions Act ("GWSA") was updated by the enactment of An Act to Create a Next-Generation Roadmap for Massachusetts Climate Policy ("Roadmap Law"), under which the Commonwealth is mandated to achieve net-zero GHG emissions, or an 85% reduction below 1990 emissions levels, by the year 2050.[1]

[1] 2021 Mass. Acts Chapter 8.

In December 2020, Massachusetts' Executive Office of Energy and Environmental Affairs ("EEA"), in collaboration with Massachusetts Department of Environmental Protection ("MassDEP") and Massachusetts Department of Energy Resources ("DOER") released its 2050 Decarbonization Roadmap,[2] as well as its Interim Clean Energy and Climate Plan ("CECP") for 2030.[3] A final Clean Energy and Climate Plan for 2025 and 2030 was released on June 30, 2022 and included sublimits by sector for the first time as required by the Roadmap Law[4] and a Clean Energy and Climate Plan for 2050 ("2050 CECP") was released in December 2022.[5] Pursuant to the 2050 CECP, because it achieves Massachusetts' GHG emissions reductions mandate at the least cost, "[t]he dominant strategy to decarbonize transportation and buildings is electrification."[6]

Massachusetts began its review of the potential use and value of energy storage in 2015, conducting a study and report process under the title "State of Charge: Massachusetts Energy Storage Initiative".[7] Since then, significant advancements have been made which make energy storage more cost-effective and efficient; in addition, development of non-lithium battery materials has the potential to reduce the environmental justice impacts of lithium mining.[8] In the Climate Act of 2022, Massachusetts' Legislature directed DOER to conduct a study reviewing the current and potential future status of energy storage markets in the Commonwealth, including potential benefits for consumers, and role in achievement of Massachusetts climate mandates.[9] The resultant study and report "Charging Forward: Energy Storage in a Net Zero Commonwealth" are the subject of these comments.[10]

DOER's Storage Report: "Charging Forward"

The Report provides eight conclusions arising from the Study:

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[2] Mass. Exec. Office of Energy and Env't. Affairs, Massachusetts's 2050 Decarbonization Roadmap (2020), Available at https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download.
[3] Mass. Exec. Office of Energy and Env't. Affairs, Clean Energy and Climate Plan for 2030 (2020), Available at https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download
[4] Mass. Exec. Office of Energy and Env't Affairs, Massachusetts Clean Energy and Climate Plan for 2025 and 2030 (Jun. 30, 2022); available at: https://www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download.
[5] Mass. Exec. Office of Energy and Env't Affairs, Massachusetts Clean Energy and Climate Plan for 2050 (Dec. 2022); available at: https://www.mass.gov/doc/2050-clean-energy-and-climate-plan/download.
[6] 2050 CECP at xiv.
[7] MA. Dept. of Energy Res., et al. "State of Charge: Massachusetts Energy Storage Initiative" (2016) available at: https://www.mass.gov/doc/state-of-charge-report/download.
[8] Balkan Green Energy News, "Iron-air batteries are 10 times as cheap as lithium, and will be produced from 2024" (Jan. 24, 2023) available at: http://tinyurl.com/bdh59nsu; Hoffs, Charlie "Challenges and Opportunities in Mining Materials for Energy Storage Lithium-ion Batteries" (Dec. 22, 2022) available at: https://blog.ucsusa.org/charlie-hoffs/challenges-and-opportunities-in-mining-materials-for-energy-storage-lithium-ion-batteries/.
[9] St. 2022, c. 227, section 20.
[10] Dept. of Energy Res., "Charging Forward: Energy Storage in a Net Zero Commonwealth", (Dec. 31, 2023) available at: https://www.mass.gov/doc/charging-forward-energy-storage-in-a-net-zero-commonwealth-report/download.

1) The deployment and use of energy storage systems is a critical and cost-effective strategy for the Commonwealth to encourage in meeting its goals under the 2050 CECP.
2) Increasing renewable generation is key to unlocking environmental, economic and, and reliability value propositions for energy storage.
3) Financial siting, permitting, interconnection, operational, technical, and supply chain barriers must be overcome to allow for the deployment and use of energy storage systems to the level needed for the Commonwealth to meet its goals under the CECP.
4) Energy storage can provide high resiliency value at the distribution circuit level and for end-use customers, particularly critical facilities. Determining the value of resiliency for an energy storage use case requires site-specific investigation.
5) Energy storage of varying duration can help the Commonwealth's grid reliability risks as it decarbonizes out to 2050.
6) While there are some commercially available MDES and LDES technologies, more technology options will be needed. A variety of MDES and LDES technologies are under development but require further de-risking in order to achieve commercial scale.
7) Due to their complementary nature, energy storage systems when paired with renewables can exhibit diversity benefits, where the paired capacity values exceeds the sum of the individual capacity values.
8) Long duration energy storage has the ability to supplant significant quantities of dispatchable thermal capacity in futures with high renewable deployment.

The Report then offers recommendations regarding financing, procurement, targets, rate design, and more.

Comments

In general, CLF agrees with the findings set forth in the Report. The benefits of storage technologies can be generally grouped into three categories: emissions, reliability, and costs. CLF encourages DOER to recognize the near-term benefit of the winter peak reduction of multi-day storage ("MDS") and to adjust the prospective timeframe for procuring energy storage resources to better support achievement of Massachusetts' climate goals. DOER should also set more aggressive MW targets for energy storage.

Storage technologies have and will continue to have an important role in Massachusetts' energy transition and clean energy future. The benefits of storage technologies will be amplified by careful planning, including co-locating energy storage with clean generation technologies. Indeed, as noted in the Report, charging storage resources using fossil generators does not yield significant emissions benefits because the emissions profile of a storage resource is based on the source of charging.[11] Pairing energy storage with non-dispatchable clean resources such as wind and solar will increase the availability of zero-emissions energy in Massachusetts and New England.

[11] Report at 4-5.

MDES and LDES may be capable of replacing dirty peaker plants – a function of energy storage technologies that provides both emissions and reliability benefits. Storage technologies which can store energy for up to one or more days will be able to provide energy when wind and solar generation is unavailable or insufficient to meet demand. Dispatching energy generated by clean resources and stored in MDES and LDES batteries will reduce, and potentially eliminate, the need for dirty fossil fuel powered peaker plants, eradicating a significant amount of emissions from the regional electric grid and ensuring the lights stay on without the use of resources that emit greenhouse gases.

The Report notes the long-term reliability benefits of MDES and LDES technologies, but fails to acknowledge the short-term benefits in the form of winter reliability. The issue of winter reliability has concerned the states, consumers, advocates, and the grid operator. In fact, the matter has been so persistently discussed that the Federal Energy Regulatory Commission ("FERC") held two fora in New England to discuss the issue.[12] When deployed, multi-day Storage ("MDS") can reduce the cost of winter reliability measures by 74% in comparison to shorter duration storage technologies and reduces the total storage capacity needed to achieve a reliable system during cold periods.[13] Whereas New England's current winter reliability efforts are heavily reliant on fossil fuels (e.g. the Inventoried Energy Program[14]), deployment of MDS offers the short-term benefit of winter reliability while advancing progress toward Massachusetts' net-zero emissions mandate.

Energy storage technologies also have a role to play in keeping the cost of electricity in the Commonwealth affordable. By carefully siting energy storage resources to aid in interconnection of clean energy generators, especially offshore wind, energy storage can help to streamline energy infrastructure, thereby reducing costs.[15]

Despite the many benefits of MDES and LDES, including MDS, and the value these technologies would provide in Massachustts' efforts to decarbonize, DOER asserts the need to procure these technologies is not immediate.[16] This is a mistake. With only twenty-six years left to achieve net-zero greenhouse gas emissions, it is important that Massachusetts act on reasonable opportunities to advance the Commonwealth's clean energy future. In the near-term, that means procurement of commercially viable energy storage resources, but DOER should plan to procure LDES and MDS as well, due to the significant value these technologies can provide. Procurements of energy storage under the 2022 Massachusetts Climate Act would also significantly amplify the benefits of offshore wind, further advancing the goal of achieving net-

[12] https://www.ferc.gov/news-events/events/new-england-winter-gas-electric-forum-09082022 and https://www.ferc.gov/news-events/events/2023-new-england-winter-gas-electric-forum-06202023
[13] Wilson, Rachel, et al. "Clean, Reliable, Affordable: The Value of Multi-Day Storage in New England" at 4, 18(Sept. 2023) available at: https://formenergy.com/wp-content/uploads/2023/09/Form-ISO-New-England-whitepaper-09.27.23.pdf.
[14] ISO-NE "Inventoried Energy Program", available at: https://www.iso-ne.com/markets-operations/markets/inventoried-energy-program.
[15] Report at
[16] Report at 17.

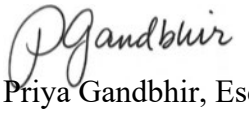
zero emissions.[17] CLF understands and accepts that DOER is also planning to look into alternative strategies for procuring energy storage resources[18], but encourages DOER to utilize all reasonable and available avenues for integrating this valuable resource into Massachusetts' energy systems.

In addition to acting as soon as practicable to begin procurement of energy storage in Massachusetts, CLF recommends setting aggressive targets for energy storage. DOER's current strategy is to tie energy storage targets to deployment of other clean energy resources, e.g. solar and offshore wind.[19] For 2030, DOER recommends procuring 250 MW of energy storage for every 1 GW of deployed renewables; for 2035, the recommendation is 200 MW of energy storage for every 1 GW of deployed renewables, including at least 1 GW of MDES or LDES.[20] CLF asserts that the target should not drop in 2035, but remain the same as the 250 MW storage/GW renewable generation target recommended for 2030. Additionally, the 2030 target should encourage procurement of MDES and LDES as well.1

Energy storage will prove to be a valuable resource in Massachusetts' energy transition and clean energy future. The benefits of these resources, especially mid- and long-duration energy storage as well as multi-day storage, can be amplified through careful planning and siting. Massachusetts can and should be aggressive with procurements and targets to advance progress toward net-zero emissions.

Thank you for your time and attention to this matter. Please do not hesitate to contact CLF at pgandbhir@clf.org with any questions.

Very truly yours,



Priya Gandbhir, Esq.
Senior Attorney

With support from:

Amy Boyd Rabin
Vice President of Policy
Environmental League of Massachusetts

Sarah Krame
Staff Attorney
Sierra Club Environmental Law Program

Kyle Murray
Director, State Program Implementation and Massachusetts Program Director
Acadia Center

[17] Report at 18.
[18] Id.
[19] Id.
[20] Id.