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Subject: **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 Clean Energy Technology Center ("MassCEC") to conduct a study on the existing energy storage market in the Commonwealth and the potential role of mid-duration energy storage ("MDES") and long-duration energy storage ("LDES") technologies. RENEW Northeast, Inc. ("RENEW")[1] submits these comments on the study prepared by Energy and Environmental Economics, Inc. ("E3"), "Charging Forward: Energy Storage in a Net Zero Commonwealth," (the "Study") and the report of DOER and MassCEC containing their recommendations on the Study that were submitted to the Joint Committee on Telecommunications, Utilities & Energy submitted in fulfilment of the requirements of the Act (the "Report").

I. Overview

The Act requires DOER to set a procurement target[2] and grants DOER the authority to conduct energy procurements based on the recommendations in the study.[3] RENEW urges DOER to conduct annual procurements for energy storage beginning this year with an RFP for Clean Peak Energy Certificates ("CPECs") and not delay the first procurement until 2030. The Study identified a multitude of benefits from having energy storage, including short-duration energy storage (SDES"), operational before 2030. Massachusetts will be joining other states in the region like Connecticut, Maine, and New York that have set energy storage targets. Each of those states have already procured energy storage or will procure it in the near-term. Even to

[1] The comments expressed herein represent the views of RENEW and not necessarily those of any particular member of RENEW. RENEW Northeast (www.renewne.org) unites environmental advocates with developers and operators of the region's largest clean energy projects to coordinate their ideas and resources with the goal of increasing environmentally sustainable power generation in New England from the region's abundant renewable energy resources.
[2] DOER must recommend to the EEA secretary "numerical deployment targets for both new and existing mid-duration and long-duration energy storage systems, which the secretary shall incorporate into the setting of numerical benchmarks for energy storage capacity pursuant to clause (xi) of section 5 of said chapter 21N."
[3] DOER "shall require solicitations and procurements in accordance with the study recommendations."

capture benefits identified for 2030 and beyond, procurements need to start in 2024 due to the lengthy timelines for projects to be permitted, obtain ISO New England ("ISO-NE") Interconnection Agreements, and complete transmission system upgrades required for interconnections.

The Report proposes a fixed amount of energy storage be deployed in portion to the amount of renewable energy capacity installed in the years 2030 and 2035. Based on the quantity of renewable energy that will be deployed in the Commonwealth according to the Massachusetts Climate Report Card, this formula results in a target of roughly 3 gigawatts of energy storage capacity by 2030.

The Act required the study to consider how to optimize both new and existing MDES and LDES. The Study, however, did not consider how to optimize existing LDES despite the fact "Pumped hydro operators note that their resources run little today (~25% utilization) due to low round trip efficiency and small price spreads."[4] RENEW requests DOER revisit the Study to consider how the benefits of existing LDES could be enhanced.

II. Comments of RENEW

A. The Benefits of Procuring Energy Storage Today

The Study supports issuance of energy storage procurements beginning this year and continuing at annual intervals during this decade with its finding that "4-hour FTM systems show positive social benefits in nearly all installation years" and "Social benefits exceed costs for 8-hour systems starting in 2029."[5] The Report concludes that, "By 2030, like today, SDES can help shave or fill daily peak demand."[6] Not waiting to procurement energy storage "will also ensure that the Commonwealth is able to maximally leverage support from Inflation Reduction Act tax credits that may phase-out in the 2030s (or sooner)."[7] Based on these findings, DOER should front load a procurement program with 2-to-4-hour batteries (SDES/MDES) and include pilot programs for LDES now to advance emerging technologies.

While storage facilities do not take long to construct, which would appear to give DOER ample time to meet 2030 goals, the estimated time to complete the ISO-NE Interconnection Study process and to construct interconnection facilities[8] and network upgrades required by ISO-NE appear to have grown substantially in recent years. Even with an Interconnection Agreement,

[4] Study at 130.
[5] *Id.* at 8.
[6] Report at 11.
[7] *Id.* at 17.
[8] ISO-NE, Interconnection Study Metrics Third Quarter, 2023 Processing Time Exceedance Report 5 (November 14, 2023), https://www.iso-ne.com/static-assets/documents/100005/qtrly_interconnection_metrics_rpt_q3_2023_public.pdf

developers have reported recent timelines for standard upgrades such as reconductoring a short portion of a transmission line have reached five years with little to no explanation from ISO-NE for the extended timeframe. Due to these major delays, having the first of a series of procurements by 2024 is necessary to ensure Massachusetts can meet a 2030 target.

1. More energy storage deployment today can address renewable energy curtailments and lower transmission system costs.

Adding energy storage to key locations on the transmission system can help reduce costs related to transmission congestion and curtailment of existing renewable energy resources.[9] Such congestion if not addressed, according to ISO-NE studies, will significantly reduce the potential value of new energy procured through Massachusetts clean energy procurements and by existing clean energy resources as well as lead to curtailed energy production from these resources. This, in turn, could lessen the greenhouse gas reduction benefits desired from any renewable energy procurement.[10] Strategically located energy storage projects can also minimize transmission and distribution grid costs shouldered by consumers.[11]

2. Energy storage can displace dirty plants and help alleviate winter security challenges.

RENEW agrees with the Study that "currently 2-to-4-hour duration storage can help meet daily peak needs"[12] but disagrees with the Study that it will only have "a negligible impact on emissions" in the near-term.[13] A major benefit from energy storage is its ability to displace dirty and expensive fossil fueled peakers.[14] The Study itself observes how energy storage especially MDES, can likely lower "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."[15]

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[9] Report at 25, 54. *See e.g.*, Energy+Environment Economics, *Maine Energy Storage Market Assessment* 22, 42-43 (March 2022), https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/GEO_State%20of%20Maine%20Energy%20Storage%20Market%20Assessment_March%202022.pdf.

[10] *See e.g.,* ISO New England, 2016/2017 Maine Resource Integration Study 43-45 (March 12, 2018), https://smd.iso-ne.com/operations-services/ceii/cluster-studies/final_maine_resource_integration_study_report.pdf (Critical Energy Infrastructure Information access required); and ISO New England, 2019 Economic Study: Economic Impacts of Increases in Operating Limits of the Orrington-South Interface (October 30, 2020), https://www.iso-ne.com/static-assets/documents/2020/10/2019-renew-es-report-final.docx

[11] *See e.g.*, *Maine Energy Storage Market Assessment* supra note 8 at 44, 46-47 ("storage benefits outweigh costs already in 2023, largely due to avoided T&D costs").

[12] Study at 7.

[13] *Id.* at 7.

[14] *See e.g.*, Strategen Consulting, LLC, *Long Island Fossil Peaker Replacement Study* 39 (2020), https://www.strategen.com/strategen-blog/long-island-fossil-peaker-replacement-study

[15] Study at 82.

This fleet of older fossil-fueled resources are risk of retiring and are high emitters of particulate matter, SOx, NOx, and other EPA-identified pollutants. Energy storage offers health benefits by displacing resources that emit particulate matter, SOx, NOx, and other EPA-identified pollutants. Studies have shown that in the near-term, the benefits of reducing these kinds of pollutants that are associated with carbon emissions, but not captured in the social cost of carbon are significant, because of the benefits to human health resulting from reducing these emissions.[16] The real health benefits of these projects to Massachusetts residents should be considered in evaluating net benefits. Massachusetts should consider avoided pollutants and associated health benefits for all project configurations.

Today, New England is reliant on its aging fleet of fossil-fueled resources with their on-site storage of oil and coal needed to address the region's chronic winter reliability problem.[17] Natural gas pipeline constraints, the requirements of gas local distribution companies ("LDCs") holding firm pipeline capacity, and the physical requirements to maintain reliable pipeline operation critically limit gas supplies available to gas-only resources at critical times. We have seen that natural gas generation and the pipeline system are vulnerable to several winter cold and storms.[18] By accelerating the switch from fossil fuels to energy storage at peak times, Massachusetts can increase reliability by lessening its dependence on these volatile commodities.

B. Procurement Targets

The Report recommends that energy storage targets be tied to renewable deployment:

- Year 2030: 250 megawatts of energy storage in Massachusetts for every 1 gigawatt of deployed renewables; and
- Year 2035: 200 megawatts of energy storage in Massachusetts for every 1 gigawatt of deployed renewables, inclusive of at least 1 gigawatt of MDES or LDES.[19]

According to the Massachusetts Climate Report Card issued in late 2023, which references the Massachusetts Clean Energy and Climate Plan for 2025 and 2030 ("CECP") modeling estimates, the Commonwealth will have these levels of renewable energy in future years:

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[16] *See e.g.*, Collingsworth, Jessica, Steve Clemmer, Paula Garcia, James Gignac, J.C. Kibbey, Sandra Sattler, and Youngsun Baek. 2018. Soot to Solar: Illinois' Clean Energy Transition. Cambridge, MA: Union of Concerned Scientists. http://www.ucsusa.org/resources/soot-solar-0

[17] *Joint One-Time Informational Report of ISO New England Inc. and the New England Transmission Owners*, FERC Docket No. RM22-16 2-3 (October 25, 2023).

[18] North American Electric Reliability Corp., *December 2022 Winter Storm Elliott Grid Operations: Key Findings and Recommendations* (September 21, 2023), https://www.ferc.gov/news-events/news/presentation-ferc-nerc-regional-entity-joint-inquiry-winter-storm-elliott. (highlighting Winter Storm Elliott in December 2022 as the fifth cold-weather outage event in 11 years).

[19] Report at 18.

- 180 megawatts of wind capacity (all onshore) in 2025 and 3,650 megawatts of wind capacity (onshore and offshore combined) in 2030.
- 4,470 megawatts of solar capacity by 2025 and 8,360 megawatts of solar capacity by 2030.[20]

These CECP estimates- about 12,000 megawatts of renewable energy in 2030- result in an energy storage target of 3,000 megawatts according to the Study's formula. While RENEW questions the basis for tying the energy storage target directly to the amount of renewable energy capacity in operation given the host of benefits from energy storage unrelated to supporting the renewable energy buildout, the amount of energy storage proposed under that formula for 2030 represents a significant energy storage buildout comparable, based on electric load, to targets in neighboring states like New York[21] and Connecticut.[22]

In addition to setting a target for energy storage deployment, DOER should also make a distinction between energy storage capacity and duration. "Initially, the major value proposition for energy storage to the grid is peak shaving and energy shifting within a day, which can be best served by high-efficiency energy storage technologies such as lithium-ion. For such a use case, adding storage capacity is more important than duration. However, as renewable penetration and electric sector load growth both increase between now and 2050, the Study found that the resulting reliability gaps increase in duration, necessitating the greater incentivization over time for energy storage technologies with longer durations, such as MDES and LDES technologies."[23] Based on these conclusions, RENEW urges DOER to make the first procurements in 2024 with a focus on SDES and MDES while including pilots for emerging LDES energy storage to advance new technologies so they are commercially competitive in the early 2030s.

C. Overcoming Impediments to Energy Storage Deployment

RENEW offers several recommendations for reducing non-financial barriers to energy storage project development.

DOER can help influence the attainment of reforms that will ensure energy storage is deployed faster and with less cost by supporting legislation this session to give energy storage developers the option to permit projects through the Energy Facilities Siting Board ("EFSB").

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[20] Massachusetts Office of Climate Innovation and Resilience, Massachusetts Climate Report Card - Power Decarbonization, https://www.mass.gov/info-details/massachusetts-climate-report-card-power-decarbonization (last visited January 31, 2024).
[21] New York Public Service Commission, Case 18-E-0130, *In the Matter of Energy Storage Deployment Program*, New York Department of Public Service and NYSERA, New York's 6 GW Energy Storage Roadmap: Policy Options for Continued Growth in Energy Storage (December 28, 2022), https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7D4753BA-916B-483E-9E35-6749B20384A6
[22] Conn. Gen. Stat. § 16-243cc (Connecticut energy storage targets of 300 megawatts by 2024, 650 megawatts by 2027, and 1,000 megawatts by 2030).
[23] Report at 18.

This change would give energy storage developers the ability to resolve challenges related to delays or denials of non-zoning permits by providing them the option to obtain a certificate from the EFSB. RENEW recommends revisions to sections 69K1/2, 69L1/2, and 69O1/2 of Chapter 164 of the General Laws, which address EFSB' authority to grant certificates to generating facilities, to add energy storage to the types of facilities that may apply for a certificate. DOER proposes one alternative method for exploring energy storage siting as a community-initiated and driven process with technical education – consent-based siting. Before RENEW comments further on this proposal, details on the concept need to be provided. As a general principle, though, energy storage should not be held to a higher standard than other forms of lawful development.

DOER should be actively engaged with ISO-NE in advocating for shorter timelines to interconnect energy storage and other interconnection process reforms required by Federal Energy Regulatory Commission ("FERC") Order 2023. RENEW also supports the call in the Study for an investigation of how energy storage deployed at the distribution level can provide reliability improvements through identification of the locations where energy storage is optimally sited.[24] Distribution-scale energy storage presents a distinct set of benefits that should be captured for ratepayer benefit. Several ongoing processes, including the Wholesale Distribution Tariff design effort and the DPU's consideration of operational parameters,[25] are critical to the success of distributed energy storage in the Commonwealth. DOER's active engagement to further these processes has been helpful to attain a resolution. RENEW encourages DOER to remain actively engaged in driving positive outcomes. Nevertheless, DOER's existing authority may not be sufficient to capture the full range of benefits that distributed energy storage has to offer. For instance, no means exists to capture the benefits of reducing distribution peak demand through energy storage, which is separate and distinct from Clean Peak value. A tariff-based program, for example, might be necessary to ensure ratepayer benefits are captured and compensation given to providers.

Massachusetts should establish a working group to explore a statewide uniform municipal property tax rate for energy storage for equitable tax treatment across the state. Today, developers will negotiate Payments in Lieu of Taxes ("PILOT") agreements. Requiring each developer to negotiate with each municipality creates barriers to entry for new development. A municipality could seek a higher tax rate to discourage storage projects. To gain a competitive advantage, it might also lead to developers to site projects in municipalities willing to offer a low tax rate. This could pit municipality against municipality and lead to less optimal locations for storage if tax considerations outweigh grid benefits.

D. Form of Procurement

RENEW supports DOER's plan for a review this year of the Clean Peak Energy Portfolio Standard ("CPS") pursuant to 225 CMR 21.00.[26] The CPS program needs to be reformed with

[24] Study at 11.
[25] D.P.U. Dockets 23-115, 23-117, and 23-126.
[26] Report at 19.

the lack of a CPEC procurement having been its biggest shortcoming. While a procurement program is contained in 225 CMR 21.05(8), the electric distribution company ("EDC") Procurements Straw Proposal considered in 2021 did not lead to the issuance of an RFP. As E3 obverses in the Study, without long-term contractual commitments with creditworthy counterparties, these projects cannot be financed and will not be built.[27] With over 17 gigawatts of new energy storage in the ISO-NE interconnection queue,[28] developers will respond to an RFP. RENEW urges DOER to complete the review in time to issue a CPEC procurement in 2024. According to an estimate from a 2020 analysis, 2 gigawatts of stand-alone energy storage and additional storage paired with wind and solar could meet the 2030 CPS compliance requirement with the higher amounts of energy storage lowering the "need to overbuild renewables."[29]

"The Study recommends that the Commonwealth assess the planned scale of program envisaged over the longer-term to inform the extent to which program reforms are pursued. To the extent alternative programs focused on larger-scale resources (> 20MW) are developed, less reform to the existing CP structure may be necessary."[30] RENEW also supports, in parallel with a CPEC procurement, development of a stand-alone energy storage procurement that could fall under DOER's proposed concept of contracting for energy services. To reach the 3 gigawatts of energy storage by 2030 not met by the CPES procurement, DOER could issue RFPs for energy services. An energy services contract could be tailored to procure storage performance characteristics, including longer durations, not captured by CPEC procurements.

E. Conclusion

Given these overwhelming benefits of storage for consumers, the environment, and reliability that can be realized today, RENEW urges DOER to embrace a target of 3 gigawatts of energy storage by 2030 and to make the first procurements in 2024 with a focus on SDES/MDES while including pilots for emerging LDES energy storage to advance new technologies so they are commercially competitive in the early 2030s.

Sincerely,

Francis E Pullaro

Francis Pullaro
Executive Director

copy: Joint Committee on Telecommunications, Utilities & Energy

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[27] Report at 21-22.
[28] ISO-NE, NEPOOL Participants [COO] Committee Report 45-51 (February 2024), https://www.iso-ne.com/static-assets/documents/100007/feb-2024-coo-report.pdf
[29] BloombergNEF, Clean Peak Standard: Massachusetts (August 13, 2020), https://www.bloomberg.com/netzeropathfinders/best-practices/clean-peak-standard/ (last visited January 31, 2024) (Estimated minimum new capacity needs in Massachusetts to meet compliance target, 2020-2030).
[30] Study at 19.