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TO: MassCEC (grid@masscec.com and aurora.edington@mass.gov)

November 9, 2022

RE: Massachusetts Long Duration Storage Study

Dear members of the MassCEC and DOER,

We are residents of Massachusetts and professors at UMass Amherst who work on electricity policy, markets, politics, sustainability, and environmental justice. We commend you for engaging with issue of energy storage in Massachusetts, and are grateful for the opportunity to provide comments on this issue. We are providing written comments that summarize and elaborate on our oral comments delivered during the 20 minute office hours meeting on 10/26/22. We organize the following according to your prompts.

- **Do you have feedback on the scope of the final report?**

Our over-all comment is that the study should not limit itself to the enumerated list of topics in the law. The storage section was not as comprehensively addressed as the portions on wind energy, but storage raises issues just as complex as wind. To move forward without considering other alternatives and factors risks overlooking important technological options, jeopardizing ratepayer and taxpayer costs, and negatively impacting ecosystems and EJ communities.

1. **The study must consider new and diverse storage technologies and alternatives, not only medium and long-term energy storage.** As the now 6-year-old [State of Charge](#) report showed, there are many new technologies that offer a wide range of storage options. Additionally, other technologies such as demand response, conservation, and distributed storage (e.g. car batteries) may provide some of the benefits of large-scale and medium- and long-duration storage. Many of these technologies will become even more beneficial in a future of potentially dramatic growth in availability of smaller-scale and distributed energy such as electric cars, busses and transport vehicles, battery walls, and smart grid-enabled metering and price signals. A narrower study focusing on current options and medium- and long-term storage risks recommendations that will keep existing long- and medium-duration storage, which are primarily pumped storage facilities that have dramatically changed the Connecticut and Deerfield Rivers, artificially competitive, possibly obstructing more creative and resilient decarbonization pathways.

2. **The study must consider diverse funding mechanisms, rather than prioritize procurement of long-term contracts.** Long-term contracts may be necessary in some cases for Massachusetts decarbonization policy, but future storage may be incentivized by other mechanisms, including ISO energy markets, even without such subsidies, since growing intermittent renewables will cause daily and subdaily energy price fluctuations from which storage technologies can profit. Long-term contracts ensure long-term costs for ratepayers. The study must consider a full range of funding mechanisms that may provide lower long-term impact on ratepayers.
- Do you have any feedback on the methodology or evaluation necessary to complete the study?
1. **To ensure benefit to the Commonwealth, the study must consider ecosystem impacts and environmental justice implications of all storage options, and include input from stakeholders from local communities.** Different technologies have different impacts on local environments and communities. These significant “costs” (and some benefits) are not included in traditional economic analysis and should be included in the study report. These kinds of interconnections are well recognized in the Act’s provisions on wind energy. In the case of existing storage, these impacts are exemplified by the two pumped storage hydropower facilities in Massachusetts, which cause large fluctuations in depth of rivers and flows, impacting myriad species, adjacent property owners, and recreational river use.
 2. **The study must consider how new incentives and programs may impact existing pumped storage facilities (currently the only medium- and long-term storage) and the rivers and communities they affect. Similarly, consideration of potential future uses of Canadian hydropower or other large hydro as “storage” must be accompanied by analysis of how these uses would impact rivers, ecosystems, river users, and nearby communities.** Analysts must take into account that *new storage incentives* may change the way *existing* pump storage operates, causing wider and more frequent river fluctuations. For example, currently under ISO-NE energy markets, Northfield Mountain Pumped Hydro operates only about 30% of the time, because it does not get extended price differentials between lowest and highest prices of the day that would make it profitable to operate it more. New state incentives could lead the station to pump and generate more hours of each day—meaning larger and more frequent fluctuations in Connecticut River flow and level, with concomitant effects on ecologies and recreation—even when ISO-NE markets would not otherwise make it profitable to operate the station. Further, Northfield Mountain has applied to add a large amount of new storage by increasing its upper reservoir. This could count as new “incremental” storage, and earn incentives, despite the massive new impact it would cause on the Connecticut River. These potential impacts that could be caused because of changes to uses of existing technologies must be studied.
 3. **DOER and MassCEC should facilitate an open and transparent process in which all stakeholders, not just energy or energy storage interests, provide input into who the consultant(s) should be and what they should study.** Part of including these concerns and stakeholders must be to ensure that the consultants chosen for the study are selected in a publicly transparent way; are vetted for their ability to consider diverse future energy scenarios; and are

qualified to evaluate environmental, environmental justice, and ratepayer priorities in addition to economic and technological dimensions of energy storage

➤ Are there any data sets you are aware of that DOER and MassCEC should utilize in the study?

We suggest you consider river flow data at the Montague and Northfield USGS gauges, and review proposed license applications and settlements for Northfield and Bear Swamp pump storage stations.

➤ Are there partners or stakeholders that should be interviewed as part of the study?

Among the stakeholders who should be included in considering potential impacts to Northfield Mountain and Bear Swamp are: local municipalities, local environmental NGOs (e.g. Connecticut River Conservancy, Trout Unlimited, American Whitewater, Appalachian Mountain Club), and Native American tribal groups, both recognized and unrecognized.

➤ Do you have any feedback on potential stakeholder processes to achieve the study objectives?

It is crucial that the study initially develop a list of potential technologies *and likely locations* for development or changed use, provide that information to local stakeholders and EJ groups, and hold hearings that are both local (accessible in person) and have remote options.

- Are there any objectives that the final study should include?

1. Over all the goals should be to

- Contribute to rapid decarbonization in Massachusetts and beyond
- Limit over all ecological and social-justice impacts, in Massachusetts and beyond
- Limit long-term ratepayer and taxpayer cost
- Make tradeoffs visible and comprehensible, and provide for robust participation, to democratize the energy transition
- Ensure that expenditures of ratepayers or taxpayers through storage incentives are accountable to public purposes over time
- Support other energy system goals including resilience (which may be achieved e.g. through diversification and the development of distributed energy)
- Allow for “adaptive management,” i.e. changing programs and incentives as technologies, grids, and other factors change

- Do you have any other additional feedback?

We have embedded all our feedback according to your other prompts.

Thank you very much for your consideration of these recommendations.

Sincerely,



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