SUBMITTED ELECTRONICALLY

December 8, 2023

Caroline Colan
Maine Governor's Energy Office
Caroline.colan@maine.gov

Re: Request for Information (RFI) Regarding the Development of the Maine Energy Storage Program Pursuant to P.L. 2023, ch. 374 (LD 1850)

Dear Ms. Colan:

The staff of the Clean Energy States Alliance (CESA), a national nonprofit organization, is pleased to submit these comments in response to Maine Governor's Energy Office (GEO) Request for Information, Maine Energy Storage Program Development Pursuant to P.L. 2023, ch. 374.

The Clean Energy States Alliance is a leading bipartisan coalition of US state energy agencies working together to advance the rapid expansion of clean energy technologies and to bring the benefits of clean energy to all. CESA's members include many of the nation's most innovative, successful, and influential leaders of clean energy market development, bringing the benefits of clean energy to millions of homes and businesses across the country. CESA supports its members in the development and implementation of innovative state clean energy policies and programs, with an emphasis on renewable energy, energy storage, energy equity, and resiliency. CESA and its members perform an essential role in transitioning the nation to affordable, clean energy technologies. Since its creation in 2002, the members of CESA have led transformational change in energy generation in the US, providing leadership and funding to establish clean energy markets across the country. The comments do not necessarily represent the views of individual CESA member organizations or of CESA's funders.

Energy storage procurement for fossil fuel peaker plant replacement

One of the prominent markets for today's commercialized lithium-ion batteries is providing capacity services – essentially, competing with traditional fossil fuel peaker plants. Batteries can provide these services quite competitively, both in technical and economic terms – and they are doing so, across the US and around the globe. Given the fact that Maine has only a handful of fossil fuel peaker plants, this seems to present an opportunity target for energy storage procurement in Maine. Therefore, CESA proposes that Maine include peaker plant replacement/displacement as a central goal of its energy storage procurement program.

Replacing fossil fuel peakers with battery storage has many benefits, including the following:

- Batteries ramp up and down instantaneously, providing faster and more accurate signal-following services than gas and oil peakers

- Batteries are pollution-free and can be charged from renewable sources. Fossil fuel peakers not only emit greenhouse gases, but they also emit local pollutants such as SOx, NOx, and fine particulates, which pose human health threats as well as causing environmental damage
- Because they are usually sited close to load, peaker plants can often be found in highly populated areas. This increases the health impacts of their emissions, and also creates environmental equity challenges, since low-income populations are more likely to bear the brunt of health impacts, such as asthma, that result from fossil fuel air emissions
- As opposed to fossil fuel peakers, which typically operate only a small fraction of the time, batteries can provide additional community benefits – for example, they can provide clean back-up power when sited behind customer meters or on an islandable distribution circuit
- Adding batteries and renewable generation, which are often developed in tandem, will help Maine reach state policy goals, such as its 100% clean energy goal

CESA's sister organization, the nonprofit Clean Energy Group (CEG), has done a lot of work on the subject of batteries for fossil fuel peaker replacement. CEG's Phase Out Peakers project provides free resources on this topic that may be of value to the Maine GEO, including:

- Phase Out Peakers webpage: https://www.cleanegroup.org/initiatives/phase-out-peakers
- The Peaker Problem (report): https://www.cleanegroup.org/publication/peaker-problem
- Peaker plant mapping tool: https://www.cleanegroup.org/initiatives/phase-out-peakers/maps

In addition to these existing free resources, CESA, with foundation support and in partnership with a well-known energy analytics firm, is in the process of producing analysis specific to Maine, with recommendations on how a modest procurement program could result in the development of energy storage systems capable of displacing fossil fuel peaker services in the state. CESA anticipates having this analysis complete by early February 2024, and we will be happy to provide it to GEO at no cost, to help inform the design of a new Maine energy storage procurement program.

In short, fossil fuel peaker plants, typically the most costly and polluting power sources on the grid, are often located in populated areas where they create environmental and human health impacts – and these impacts are disproportionately borne by low-income and underserved communities. Lithium-ion batteries are a proven, cost-effective clean resource that can replace fossil fuel peaking services and out-compete fossil peakers in wholesale energy markets. With the right procurement program design, Maine could displace a significant portion of its fossil fuel peaker plant fleet. CESA urges the Maine GEO to pursue a peaker replacement strategy, and to consider CESA's forthcoming analysis and policy recommendations when designing Maine's energy storage procurement program.

In addition to our comments on peaker replacement above, CESA would like to offer the following stakeholder input on questions presented in Maine's energy storage procurement RFI. CESA's comments follow the numbered questions from the RFI. Not all questions are being addressed in these comments.

1) Maine law requires greenhouse gas emission reductions of 45 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. Comment on how the Maine Energy Storage Program could be designed to support deployment and operation of front of the meter energy storage resources in a manner that enables reductions in greenhouse gas emissions?

Energy storage is a multi-use resource. Therefore, obtaining specific outcomes from energy storage procurement requires either A) performance mandates or B) performance-based incentives directing specific storage performance to support the desired outcomes. In other words, some sort of legal/regulatory requirement or incentive payment will be needed to make sure the procured resources are dispatched in such a way that greenhouse gas emissions reductions result.

Other state programs have used various methods to align energy storage use with GHG emissions reduction goals. Maine GEO should look at the following programs:

a. California SGIP program – initially, SGIP incentivized storage installation without regard to how the installed resources would be used. After analysis shows that GHG emissions actually increased as a result, the program was amended to make half the incentive dependent on storage being dispatched on a California ISO emissions signal. This ensured that batteries incentivized under the program would charge during low emissions hours (or from renewable sources) and discharge during high emissions hours, thus displacing the most polluting generators. Subsequent analysis showed that emissions rates decreased once this program amendment was made.
b. Massachusetts Clean Peak Standard – this program is set up much like a traditional renewable portfolio standard, but is focused on the peak demand hours. The intent is to use renewable generation and energy storage to displace dirty peaker plants. Utilities are required to procure an increasing percentage of peaking power from clean resources each year. NOTE – the MA CPS is a "passive dispatch" program, meaning that participants are only required to charge and discharge during defined hours, not in response to a signal in real time, and batteries are not required to charge from renewables in order to qualify. Because of this, some critics have charged that the program is not as effective as intended. This is due to the fact that natural gas is usually on the margin in New England, so much of the time stand-alone storage in the CPS is merely shifting gas generation from one time of day to another. A better-designed clean peak program might be more effective.

In general, the "low hanging fruit" for GHG emissions reduction is peaker plant replacement, and batteries are ideally suited to achieve this. Fossil fuel peakers are among the dirtiest generators on the grid, and also the most expensive. Maine should design a procurement program that mandates or incentivizes new energy storage resources to provide peaking services, in competition with fossil fuel peakers. More details on this recommendation appear above.

2) The State of Maine has significant clean energy goals, including an 80 percent renewable portfolio standard by 2030 and a goal of 100 percent clean energy by 2040. Comment on how the Maine Energy Storage Program could be designed to encourage the development of front of the meter energy storage resources in a manner that supports incremental delivery of renewable electricity to customers, or otherwise supports the achievement of these goals?

One way to support renewable and clean energy goals in an energy storage procurement program is to offer incentive adders for storage co-located with renewable generation (or storage contractually purchasing renewable generation). The Massachusetts SMART solar incentive has a similar design, offering an incentive adder for energy storage developed with eligible solar PV. Offering an adder for storage to charge from renewables encourages the development of renewable generation, and ensures that the stored power is "clean." This can increase its value, for example in a REC or clean peak program.

As discussed above, stand-alone storage charging from the grid does not necessarily support or promote renewable generation. However, there may be specific times when standalone storage could support renewables – for example, if there is excess wind power at night in some areas, which would otherwise be curtailed, storage charging during those hours could reduce the need for wind curtailment. This may be worth investigation, but it would likely be a relatively small market opportunity.

3) How should the Maine Energy Storage Program value and prioritize net benefits to the electric grid and to ratepayers to "provide one or more net benefits to the electric grid and to ratepayers?"

> **a) What inputs or data sources should the GEO prioritize, if any, in implementing any cost-benefit test or tests? 3 38 M.R.S. §576-A. 4 35-A M.R.S. §3210.**
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> **b) Comment on cost-benefit test or tests (e.g. ratepayer impact measure test, societal cost test) that the GEO should utilize in developing the Maine Energy Storage Program.**

Clean Energy Group, in collaboration with the Applied Economics Clinic, has recently published a report advancing a framework and best practices for states engaged in benefit-cost analysis for energy storage. In general, we suggest that states use the SCT as the main test, with the UCT and RIM as supplemental tests. In this scenario, the SCT is used to establish basic cost effectiveness; the UCT establishes whether utility cost recovery is sufficient; and the RIM establishes whether benefits are coming at the expense of cost-shifting between stakeholder groups. For more information, see our report, *Energy Storage Benefit-Cost Analysis: A Framework for State Energy Programs*, at https://www.cleanegroup.org/publication/energy-storage-benefit-cost-analysis-a-framework-for-state-energy-programs.

4) Comment on how the Maine Energy Storage Program could enable improved electric reliability in Maine and how the Maine Energy Storage Program should define and operationalize "improved electric reliability."

See response to #5 below

5) Comment on how the Maine Energy Storage Program could enable improved electric resiliency in Maine and how the Maine Energy Storage Program should define and operationalize "improved electric resiliency."

Without knowing whether utilities in Maine will be able to own energy storage, it is difficult to answer the reliability question. Energy storage for increased grid reliability is often placed on utility substations where, for example, additional hosting capacity is needed to accommodate a large amount of variable generation. Third party storage developers could theoretically provide reliability benefits, but it is unclear how they would be compensated for that service. If the state and the utilities were to publish maps showing where storage for reliability services should be placed on the grid, and incentivize storage developers for doing this, there might be some storage assets developed as a result – but there would likely be siting issues (are utilities able to have privately owned storage assets on their substations?).

Resiliency is a different matter. Distributed storage behind customer meters often provides a resilience benefit to the host facility. It is also possible for front-of-meter storage to provide resilience benefits, but this is again easier if the utility can own the storage asset and use it to island distribution grid circuits that are prone to outages. For examples of this, see Green Mountain Power's Resilience Zones program at https://greenmountainpower.com/news/green-mountain-power-microgrid-in-panton-vermont-featured-on-pbs-nova.

12) Comment on barriers to deployment of utility-scale energy storage systems that should be considered in the design of the Maine Energy Storage Program, and any recommended solutions or mitigating measures that could be incorporated into the program design.

There are many barriers to deployment of energy storage. One notable barrier is the interconnection process, which may result in high costs, long wait times, and delays during interconnection studies. While interconnection barriers may apply to all kinds of distributed energy resources, there are particular interconnection barriers that specifically impact energy storage. Clean Energy Group has recently published a report on this topic, *The Interconnection Bottleneck: Why Most Energy Storage Projects Never Get Built,* available at https://www.cleanegroup.org/publication/the-interconnection-bottleneck-why-most-energy-storage-projects-never-get-built. The report explains the interconnection barriers affecting energy storage and makes recommendations for states to help reduce those barriers.

14) Comment on any utility-scale energy storage systems or procurement systems in other jurisdictions that may have relevant considerations for the Maine Energy Storage Program.

In designing its energy storage procurement, Maine should look at California's energy storage procurement. There are a number of elements of California's program that are worth emulating:

a. Storage is required to be procured in different locations on the grid (each regulated utility must procure a specific amount of transmission-sited, distribution-sited and customer-sited storage). This ensures that energy storage as a resource will be used in a wide variety of applications in various locations on the grid, and that customers will be able to participate. It also makes a space for aggregators to enter the market.
b. Utility ownership of storage is limited to a percentage of the total procurement target. This ensures that third parties can own storage.
c. Large hydroelectric storage (greater than 50 MW) is not eligible. This prevents one or two big pumped hydro projects from fulfilling the procurement mandate, to the exclusion of other technologies and applications.

As mentioned above, Maine should also consider adopting some version of the Massachusetts Clean Peak Energy Standard, in order to focus new energy storage assets on providing peak demand capacity services.

Clean Energy States Alliance appreciates this opportunity to submit comments in response to Maine's energy storage RFI. We will be happy to answer any questions and can provide additional resources as needed.

Respectfully submitted,

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Clean Energy States Alliance