

DOCKETED

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on Workshop on Advancing Non-Lithium-Ion Long Duration Energy Storage Technologies

Additional submitted attachment is included below.

DOCKET: 19-ERDD-01

FROM: Hydrostor Inc.

DATE: April 26, 2022

SUBJECT: Comments on "Workshop on Advancing Non-Lithium-Ion Long Duration Energy Storage Technologies"

Introduction

Hydrostor Inc. ("Hydrostor") is a leader in advanced compressed air energy storage ("A-CAES"), a proprietary emissions-free technology that stores electricity in the form of compressed air. A-CAES is a clean technology solution that will help California achieve its goal of decarbonizing the electricity grid and achieving its renewable energy goals. A-CAES is a compelling bulk-scale (200-500+ MW), long duration (4-24+ hours) energy storage solution. Hydrostor A-CAES is unique amongst long duration energy storage in that it can be sited where needed, including in many urban or semi-urban locations. It is a long lifespan resource, with 30-50+ years of standard operability. Importantly, Hydrostor is actively developing a number of projects in California using its A-CAES technology.

Hydrostor strongly supports the Governor's proposed 2022-2023 Budget allocating \$380 million to advance non-lithium-ion long duration energy storage ("LDES") technologies and projects. We further appreciate the work that the California Energy Commission (the "Commission"), Commission staff and other agencies (e.g. the California Public Utilities Commission ("CPUC"), California Independent System Operator ("CAISO")) undertook related to the workshop held on April 5, 2022. However, Hydrostor has serious concerns regarding the potential program design for the \$380 million allocated for LDES in the Governor's budget. We worry that the resulting program will either be duplicative of the existing Electric Program Incentive Charge ("EPIC") program or it will not be aligned with other key state priorities such as ensuring grid reliability in the mid-decade timeframe. Such outcomes would represent an inefficient and ineffective use of state funds. The Commission has an opportunity now, prior to program launch, to ensure these adverse outcomes are avoided.

Comments

Funding Should Address An Unmet Need

Hydrostor believes that there are already ample program funding opportunities for LDES pilot and demonstration projects through the EPIC program. This was highlighted in the presentation by Mike Gravely, CEC EPIC Team Lead and Supervisor, at the workshop on April 5, 2022 and by the LDES representative companies that have been EPIC recipients.

Consequently, the \$380 million dedicated to LDES funding in the Governor’s Budget (which we shall refer to as the “LDES Commercialization Program”) should be used to address an unmet need and be allocated to projects and technologies that are on the cusp of commercialization.

The LDES Commercialization Program could be directed to both development and capital cost contributions to non-lithium-ion LDES projects in order to level-the-playing field with commercial conventional technologies and assist with the timely adoption of LDES technologies by load-serving entities (“LSEs”). This would directly assist near-commercial projects to hit commercial project financing thresholds and allow for substantial LDES capacity to come-online in time to meet existing Mid-Term Reliability (“MTR”) mandates for LDES by 2026-28 – this will have a direct and significant impact toward ratepayer cost reductions by leveraging the most cost-effective technologies that might otherwise face barriers to adoption in this timeframe. We believe that encouraging technology diversity is especially important given recent issues with lithium-ion supply chains, commodity price increases and tariff issues.

We believe the following cost categories should be eligible for LDES Commercialization Program funding and have included examples of potential eligible cost types in each. While not an exhaustive list, we believe it is indicative of the rationale and type of expenditure that would help to de-risk technologies for commercial application in California and enable ratepayer savings measurable by mid-decade.

Development Expenditures, including:

- First-of-a-kind permitting for LDES resources in California;
- Engineering for design, constructability and de-risking of first-of-a-kind scale LDES resource in California;
- CAISO interconnection pathway for LDES deliverability; and
- Market interfacing for new LDES resource into CAISO markets.

Capital Expenditures, including:

- Technical modifications to enable LDES resource registration into California context;
- Capital modifications required to provide California-specific benefits like flexible ancillary services and Resource Adequacy; and
- Capital modifications required to provide black start capabilities specific to California.

Development and Capital Expenditures to enable additional de-risking required for utility acceptance, including:

- Redundancy in system configuration;
- Expansion capabilities, for future expansion of durations, given regulatory uncertainties in California and first-time design;
- Performance guarantees to enable California-specific backstopping to LSEs;

- California-specific operating protocol and intermediary arrangements;
- Phased facilities to enable de-risked roll-out of larger capacities or support earlier in-service to meet reliability needs;
- In-situ geological testing to ensure performance to utility requirements;
- Shaft advancement for storage systems/cavern testing to de-risk; and
- Specific equipment tests in-shop to de-risk for California utility application.

Projects That Provide Real Grid Benefits Should Be Prioritized

Hydrostor believes that projects that provide real grid benefits including assisting in meeting Mid-Term Reliability needs of LSEs should be prioritized for consideration. We believe that this is consistent with comments from certain CEC Commissioners during the April 5, 2022 workshop.

We understand that the CEC has typically funded EPIC projects through grants equal to 80% of the project cost with 20% project match and staff has indicated that is their thinking on these funds. Utility scale projects, such as Hydrostor's A-CAES projects in California, will be majority funded by the project developer and their financiers. However, the State can get the greatest “bang for the buck” by contributing a modest amount to these projects – which, again, will solve real grid needs – to get them past the cusp of commercialization. These projects will be recovering the majority of their costs through long term contracts to load serving entities and do not need the CEC to be the majority funder as there are actual off-takers who have real reliability needs to address.

Pilot projects, for which funding programs already exist, simply do not provide the same grid benefits. Pilot projects should remain in the current EPIC funding program and not be contenders for these dollars.

Another discrete area where funding from the LDES Commercialization Program could assist and have a real benefit to the grid is through enabling the phasing (which has an added cost) of a larger project to achieve an earlier in-service date for some of the capacity. Given supply chain issues, commodity price increases and tariffs challenging the ability of many lithium-ion projects (LDES or not) to achieve a timely in-service, spending monies on such endeavors would be improve California's reliability outlook.

To the extent that the Commission would like to provide additional funding to LDES pilot or demonstration projects or technologies, we believe that should be done in a separate tranche. However, the tranche of projects that can provide real grid benefits (e.g. will be procured by a LSE to satisfy LDES procurement requirements established by the CPUC or a local publicly owned utility to meet storage, clean energy, climate or other requirements established by the POU's governing board) should be prioritized from a timing standpoint.

Additional Program Considerations

In addition to the key program design elements above, the following are additional LDES Commercialization Program recommendations which the Commission should consider:

- **No Maximum Project Size.** There should not be a maximum project size – either from a capacity or duration perspective – for projects to be eligible. On the contrary, the Commission should consider if there should be a minimum project size (e.g. 100 MW) for particular tranches of funding for the LDES Commercialization Program such as the tranche directed to addressing real grid needs.
- **CEQA Approval Can Be A Condition Precedent.** We understand that CEC grant funding typically requires that projects have already received California Environmental Quality Act (“CEQA”) approval or that qualify for CEQA exemptions, particularly under the current EPIC program. While Hydrostor understands the need to ensure funded projects comply with CEQA, the Commission should consider if a funding commitment can be made prior to CEQA approval (i.e. be a condition precedent to funding). This is consistent with how many federal funding and support programs are structured (e.g. the Department of Energy Loan Program Office’s Loan Guarantee Program). Restricting funding to only projects that have already received CEQA approval or are CEQA exempt would unduly restrict the participation in the program, undermine the benefits the LDES Commercialization Program could provide and potentially jeopardize reliability.
- **Equity, Community and Workforce Benefits Should Be Considered In Evaluations.** In evaluating potential projects and technologies for funding, the Commission should prioritize projects that can support equity objectives including the transition of employees in conventional (e.g. nuclear, thermal) generation, demonstrate the use of a local workforce and / or support local (and state) economic development.

We look forward to working with the Commission as it supports long-duration energy storage technologies and the vital role a range of technologies will play in California’s energy future.

/s/ Jon Norman
Jon Norman
President