About Cypress Creek Renewables

Cypress Creek Renewables is a leading renewables developer and independent power producer. It develops, finances, owns, and operates utility-scale and distributed solar and energy storage projects across the United States with a mission to power a sustainable future, one project at a time. Since inception, Cypress Creek has developed 12GW of solar projects. Today it owns 2GW of solar and has a 23GW solar and storage pipeline. Cypress Creek's leading O&M services business, Cypress Creek Solutions, operates and maintains 4GW of solar projects for customers across 24 states. For more information about Cypress Creek, please visit ccrenew.com.

Background

On August 16, 2023, the Massachusetts Clean Energy Center (CEC) and the Department of Energy Resources (DOER) held a stakeholder meeting titled "Charging Forward: Energy Storage Toward A Net Zero Commonwealth" as a part of the mid and long-duration energy storage study mandated by An Act Driving Clean Energy and Offshore Wind, passed on August 11, 2022

We provide below our comments on the information provided during the stakeholder meeting and recommendations for the next steps.

Study Results

- While we understand the rationale behind not employing a capacity expansion model for this analysis, it would be helpful for the report to provide some commentary on the scenarios and drivers for battery storage economic entry into ISO-NE system and timing of the entry.
- The marginal ELCC trajectories for the different durations of storage presented in the presentation are helpful to understand the saturation impacts.
- The study should provide average ELCC trajectories for all short duration, mid duration and long duration energy storage technologies in both 2030 and 2050, as defined in HB5060 since the

analysis assumes that there is no existing storage in the system when presenting the saturation impacts.

- In addition, it would also be helpful to analyze and provide the relative energy arbitrage, ancillary services and ELCC values of each storage type for comparing different durations of storage over the forecast horizon in the E3 study. The reliability value of energy storage will also depend on the amount and type of energy storage deployed.

Next Steps and Recommendations

- Cypress Creek agrees with the study results that current and potential revenue streams from the wholesale markets in 2030 will not be enough to support deployment of mid and long-duration battery storage technology, as defined in HB5060. However, new battery storage additions can accelerate the transition of the grid in line with clean energy targets set by Massachusetts and provide reliability as excess capacity in the ISO-NE system declines with the retirement of older fossil fuel generators. To accomplish the installed energy storage volumes required to enable this transition, the state will need to provide additional incentives through policy and clearly established procurement mechanisms. Ultimately, state-led procurements can provide firmness to revenues and complete the missing money gap currently present in the market. The E3 report should clearly outline recommendation and timing for both policy and future procurements of energy storage resources.
- CCR has worked closely with The Brattle Group to run an analysis using a capacity expansion model to also examine the role of battery storage in the ISO-NE market. According to the draft preliminary results, 3.4 GW of 4-hour, mid-duration energy storage is needed on the system by 2032 to achieve both clean energy goals and meet regionwide resource adequacy requirements, selecting mid-duration storage over both short-duration storage (1-hour and 2-hour) and longer duration storage (8-hour). This need for additional storage by 2032 is comparable to the CECP

study, which projects an estimated 3.3 – 4.0 GW[1] of new electricity storage resources by 2030 to achieve clean energy goals. The CECP does not specify the type of storage or duration added in this timeframe. Massachusetts has the largest share of load in New England, and therefore the majority of this storage is expected to be deployed within the state. Considering the current 7-year[2] development timeline for transmission scale projects, and around a 3.4[3] GW need, Mass CEC needs to send an economic signal to the market, through annual procurement mechanism to enable investment in the development of energy storage resources to hit the required installed capacity of energy storage.

- Given the current lack of commercial viability of various Long- Duration Energy Storage (LDES) technologies, the policy and procurement mechanisms generated from the upcoming Mass CEC report should focus on Mid-Duration Energy Storage technologies (4 hr+ as defined in HB 5060). The Brattle study demonstrates mid-duration storage is the most cost effective through the early 2030s with longer-duration storage needed in the mid- to late-2030s.

Conclusion

Thank you, again, for the opportunity to offer these comments.

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[1] CECP modeling results indicate New England wide total electricity storage of 8.2 – 8.8 GW by 2030 depending on the scenario. Compared to 2020 4.8 – 4.9 GW of reported storage, that is an addition of 3.3 to 4.0 GW of "electricity storage" by 2030. However, CECP includes pumped hydro storage under their "electricity storage" and does not specify duration.

[2] The average development timeline from site origination to in-service is 6-7 years in Massachusetts. In areas of high demand, where energy storage resources are most valuable to the system- the development timeline will exceed 8+ years due to the serial study process currently employed by ISO-NE

[3] 3.4 GW of 4hr duration is from the Brattle study and is within the 3.3 – 4.0 GW range from the five different CECP scenarios.