ABSTRACT/SUMMARY

Considering the Reliability Value of Long Duration Energy Storage when Designing Policy Incentives and Programs

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Energy storage is valuable to achieving near-complete electric sector decarbonization, supporting renewable integration, absorbing and shifting excess solar or wind generation, and contributing to reliability by supporting system needs during high load, low renewable output periods.

To ensure that sufficient storage is online to support renewable energy in the 2030s-2040s, Northeast jurisdictions are setting targets and providing policy incentives to drive deployments. Most energy storage resources being built or planned today are lithium-ion batteries with four hours or less of discharging capacity and thus shift energy around intraday. These best serve use cases such as providing grid stability, shifting solar generation into peak demand in the evening.

Longer duration energy storage (LDES) technologies are emerging and provide an opportunity to support grid reliability as systems decarbonize. In systems that achieve high levels of renewable energy, LDES can offset some amount of dispatchable generation that is otherwise needed in renewable drought periods, most challenging in cold climate winter peaking regions. However, the reliability contribution of LDES will depend on the rest of the renewable portfolio, with its effective capacity value higher and more enduring when significant renewable build-out is achieved. For winter reliability in the Northeast US and Atlantic Canada in particular, offshore wind and long-duration storage have significant complementary effects.

Policy makers designing incentives and programs for storage should consider the evolving economic and reliability value these resources provide, which is directly tied to how the rest of our clean energy goals are progressing.

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