

2020 Economic Study Request



MC/RC Joint Meeting
July 1, 2020

nationalgrid

Motivation

- **Drivers**

- States are increasingly procuring and assigning value to clean resource production
- NESCOE 2019 Offshore Wind study showed high levels of renewable spillage
- MIT's "Deep Decarbonization of the Northeastern U.S. and the Role of Canadian Hydropower" 2020 study demonstrated bi-directional transmission with Quebec complements high intermittent resource mixes in New England

- **Purpose**

- Identify a potential pathway, leveraging transmission and battery storage, to meet state clean energy goals
- Evaluate use of large scale, dispatchable reservoir hydro in fully integrating large penetrations of intermittent renewables cost-effectively
 - Scale of storage needs at high intermittent penetration likely to be met by a diversity of resources
 - Seasonal and resource diversity between New England and Quebec may be leveraged to the more effective achievement of state policy goals and benefit of customers

Study Overview

■ High-level Assumptions

- 2035 Study Year
 - Demand extrapolated from 2020 CELT
 - Heating load of ~9,500 GWh
 - EV load of ~7,000 GWh
 - 2015 weather year for wind and PV profiles

■ Scenarios

- Incremental resources: beginning with “base case”, varies offshore wind, solar and thermal retirements
- Bi-directional: varies use of existing ties and additional ties to explore potentially up to 3,600MW of export capability to Quebec
- Battery Storage: varies the amount of in-region battery storage with the lowest at 2,000MW as used in the NESCOE study

■ Deliverables

- Economic: Production cost, marginal prices, load-serving entity energy expenses, congestion, spillage, emissions, exchange with Quebec
- Ancillary Services: load following/ramping, operating reserves, regulation

Status and Next Steps

- **Previous PAC presentations by National Grid and ISO-NE**
 - April 23, 2020 – National Grid request
 - May 21, 2020 – ISO-NE Assumptions Part I
 - June 17, 2020 – ISO-NE Assumptions Part II

- **Study will continue to progress at the PAC**
 - July 22, 2020 – ISO-NE Assumptions Part III
 - Q3 2020 – draft results expected and sensitivities identified
 - Q4 2020 – sensitivity results and draft ancillary services results expected
 - Q1 2021 – draft and final reports expected

Supporting the Future Grid Initiative

- **Carbon compliant resource mix**
 - “Base Case” meets 2035 legislated targets for the New England states, interpolating midpoints for target dates beyond 2035
- **Pathway with a focus on storage**
 - Provides a pathway emphasizing role of exchange with Quebec
 - Previous studies indicate Quebec may be utilized as a balancing resource, complementing intermittent renewables
 - Important to include this pathway option when analyzing operational issues as part of the Future Grid Initiative
 - Includes various levels of in-region battery storage for short-term storage
 - In combination with the long-term storage option provided by bi-directional exchange with Quebec, spillage may reduce, more effectively using renewables at all hours

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