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Preparing for Extreme Weather Challenges in an Evolving Power System

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ISO New England's *Mission and Vision*

Mission: *What we do*

Through collaboration and innovation, ISO New England plans the transmission system, administers the region's wholesale markets, and operates the power system to ensure reliable and competitively priced wholesale electricity

Vision: *Where we're going*

To harness the power of competition and advanced technologies to reliably plan and operate the grid as the region transitions to clean energy



*The ISO's new **Vision** for the future represents our long-term intent and guides the formulation of our Strategic Goals*



Two Core ISO-NE Strategic Objectives to Support the Transition to Clean Energy

- **Enact Responsive Market Designs**
 - Improve the current market structure and continue to evolve and reposition the market design **to accommodate the states' objectives and the transition to high levels of renewables** and distributed resources
 - **Maintain a robust fleet of balancing resources** and preserve the ability of the market to attract new entry
- **Progress and Innovation**
 - **Evolve capabilities to support the grid as the region transitions to clean energy**, including improved power system and market modeling
 - Support investments in **transmission infrastructure to enable renewable energy**
 - Facilitate the integration of distributed energy resources
 - Provide data and information-based services



Understanding and Communicating the Risks to Electric Reliability

- **Energy security risks** in New England are well-documented
 - These risks are exacerbated as large, fuel-secure resources retire and new resources are delayed
 - Concerns are heightened this winter due to sharp increases in global energy demand and supply chain contraction
 - **Unpredictable and extreme weather** exacerbates the reliability risk, as highlighted in the Winter 2017/18 Polar Vortex and Winter Storm Uri in February 2021
 - ISO-NE has initiated a project in the NEPOOL stakeholder process to conduct a probabilistic energy security study under various simulated extreme weather events. We are partnering with EPRI to develop the modeling tools.
- Fuel constraints increase the importance of **situational awareness** of available LNG and fuel-oil, and replenishment plans for those inventories are essential to understanding regional energy availability
- **ISO's winter preparations and Energy Emergency procedures** will aid in proactive and effective communication with stakeholders
 - If we experience an Energy Emergency, it may be a multi-day event. The ISO and resource owners will need assistance from state and federal governments, including well-coordinated public appeals for conservation



Identification of Key Issues

- A reliable power system depends on **two critical inputs: electric transmission and the energy supply chain** (including adequate “on call” access to significant volumes of stored energy)
 - New England has a **robust transmission system** and cost allocation methodology
 - **Fuel supply chain:** Shared by multiple industries, prioritizes heating needs, and has significant challenges during extreme weather
 - Unlike with transmission, FERC/state regulators/ISO **have no regulatory/reliability oversight over the fuel supply chain**
 - Market participants are unlikely to collectively hedge tail risks without a regulatory requirement. Further, generators do not currently have adequate incentives/cost recovery mechanisms to make long term investments in a robust fuel supply chain (since these become sunk costs and cannot be recovered).
 - Severe weather will curtail renewable energy production
 - Decarbonization will increase demand for electricity, **increasing the need for regional access to adequate volumes (i.e. days/weeks) of balancing energy**
 - The prior two decades demonstrate that wholesale electricity market design solutions to this problem are at best elusive, or at worst, unattainable



Identification of Key Issues, *cont'd*

- Reliability Standards, Regulatory Authority, and the Market Design will have to evolve
 - New England, as a region, needs to **evaluate the amount of risk** we can live with, and whether and how to mitigate those risks
 - Market design needs to **attract and retain** adequate resources to balance the variability of renewable energy throughout the clean energy transition
 - Regulatory authority, and/or reliability standards, should evolve to address these risks
 - The ISO will propose expanded ancillary services. These will provide system operators with more tools to manage uncertainty, but **are unlikely to fully remediate the fragile energy/fuel supply chain problem**
 - How will the region ensure an adequate source of **clean, firm, long-duration, balancing-energy?**



Key Takeaways

- The clean energy transition is underway and we need to discuss and craft appropriate solutions to the challenges that have been identified
- However, there are no quick fixes for the coming winter
 - Regional collaboration is essential, within the industry and with regulators and policymakers, to be prepared for the possibility of extreme weather, particularly given the constrained global energy supply chain upon which we are dependent
- Mitigating regional energy adequacy risk is critical to a successful clean energy transition. Successfully addressing this risk will be a collaborative effort by regional stakeholders, the states, ISO-NE, and FERC



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