Market Design Concepts to Prepare for Significant Renewable Generation

Reserve Procurement for Resilience

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Agenda

- Background
- Reserve Procurement for Resilience
- Timeline

Background

Background

- The NYISO conducted a preliminary review of the market design concepts proposed in the Market Assessment with 50% Renewables Report (2017 Market Assessment).
- Concepts were evaluated according to the following criteria:
  - Whether the product or rule change would incentivize performance attributes such as availability, predictability, flexibility, and dispatchability.
  - Need demonstrated by the results of the NYISO's 2017 Market Assessment.
  - Anticipated future system need based on observations from other control areas or other NYISO studies.
- The NYISO recommends that concepts which may offer benefits but are not yet well defined be prioritized as future studies or longer-term market design efforts.

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Reserve Procurement for Resilience

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Reserve Procurement for Resilience

- **Enhancements to the construction of the current operating reserve shortage pricing should be discussed with stakeholders to explore the benefits of procuring additional operating reserves to incent resource performance and promote grid resilience.**
  - Specifically, by using a concept akin to the capacity market approach, which procures excess capacity through the Installed Capacity Demand Curves.
    - The NYISO could similarly procure additional operating reserves above minimum requirements when cost effective.
    - These reserve schedules would enhance grid resilience by recognizing the value of resource availability to be responsive to unanticipated real-time operating needs.
    - The additional financial incentives would incent improved resource performance.
- **Reserve requirements could be increased in response to certain operational conditions.**
- **Including more gradual steps in the demand curves for ancillary services could help to smooth pricing volatility associated with increased renewable generation.**

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Questions for the Market Design Complete Phase

- **The NYISO and its stakeholders should consider a number of additional questions if this project is prioritized for 2019:**
  - How many additional MW of reserve should be procured?
  - Where should the additional reserve be procured?
  - When should the additional reserve be procured?
  - What shortage pricing levels should be used for the reserve demand curves?

Benefits

- **Procuring additional reserve beyond reliability requirements offers three benefits:**
  - Resilience
  - Price Formation
  - Performance

Benefits - Resilience

"The ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover from such an event."

-Federal Energy Regulatory Commission, Grid Resilience in Regional Transmission Organizations and Independent System Operators, January 8, 2018 (AD18-7-000)

- Procuring additional reserve in anticipation of an event could help the NYISO to absorb, adapt to, and/or rapidly recover from a disruptive event.
- Increasing the procurement of reserves will help with uncertainty and variability introduced by increased intermittent renewables.

Benefits – Price Formation

- **Pricing volatility was observed in the 2017 Market Assessment with increased renewable generation.***
  - Generally, quick increases or decreases in price provide a valid price signal reflecting grid conditions.
    - However, procuring more reserve at lower price points could allow a more gradual price signal that still incents appropriate resource behavior.
    - Additionally, including more gradual steps within the reserve demand curves could help to smooth the pricing volatility associated with increased renewable generation, while prices continue to appropriately reflect system conditions.

*See Integrating Public Policy: A Wholesale Market Assessment of the impact of 50% Renewable Generation, page 84, Figure 64: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2017-12-20/2017%20Market%20Assessment%20with%2050%20percent%20Renewables,%20Report.pdf

Benefits - Performance

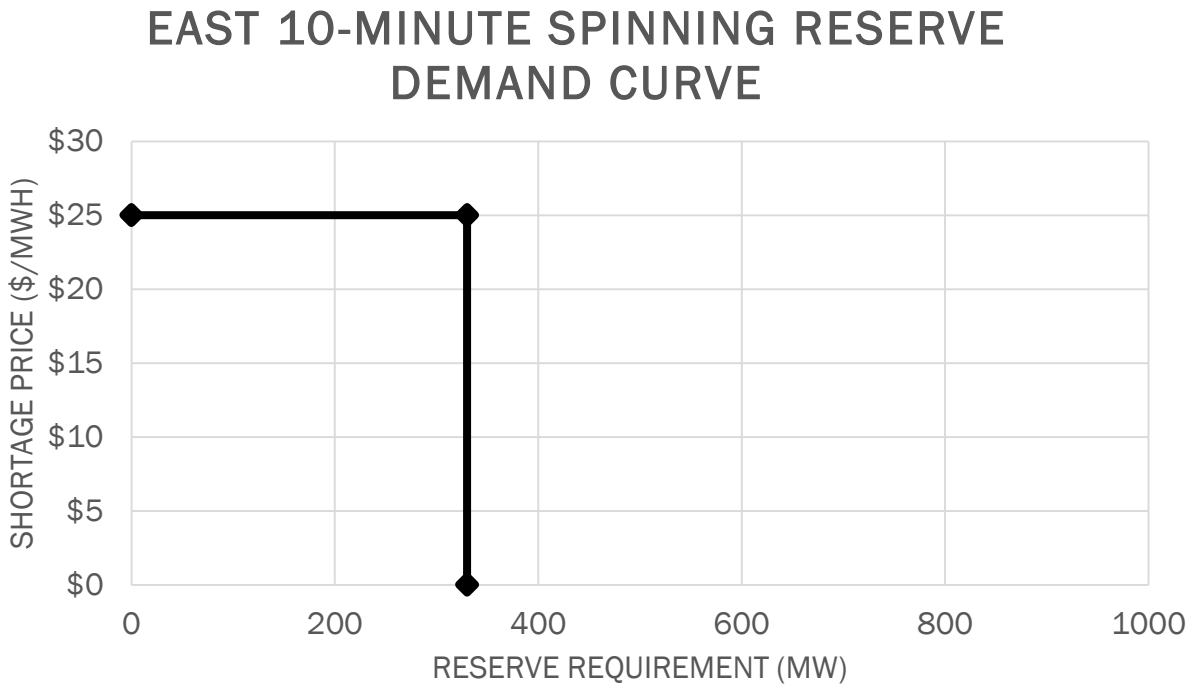
- **Providing resources with a reserve schedule incents those resources to take additional steps to prepare for conversion from reserve to energy.**
  - These steps, such as managing fuel and conducting maintenance, increase the likelihood that resources will be able to perform when called upon.

Example

- **The following example is for illustrative purposes only.**
  - Actual reserve products impacted, resilience reserve requirements, and shortage price values will have to be determined as part of the market design complete phase of this project.

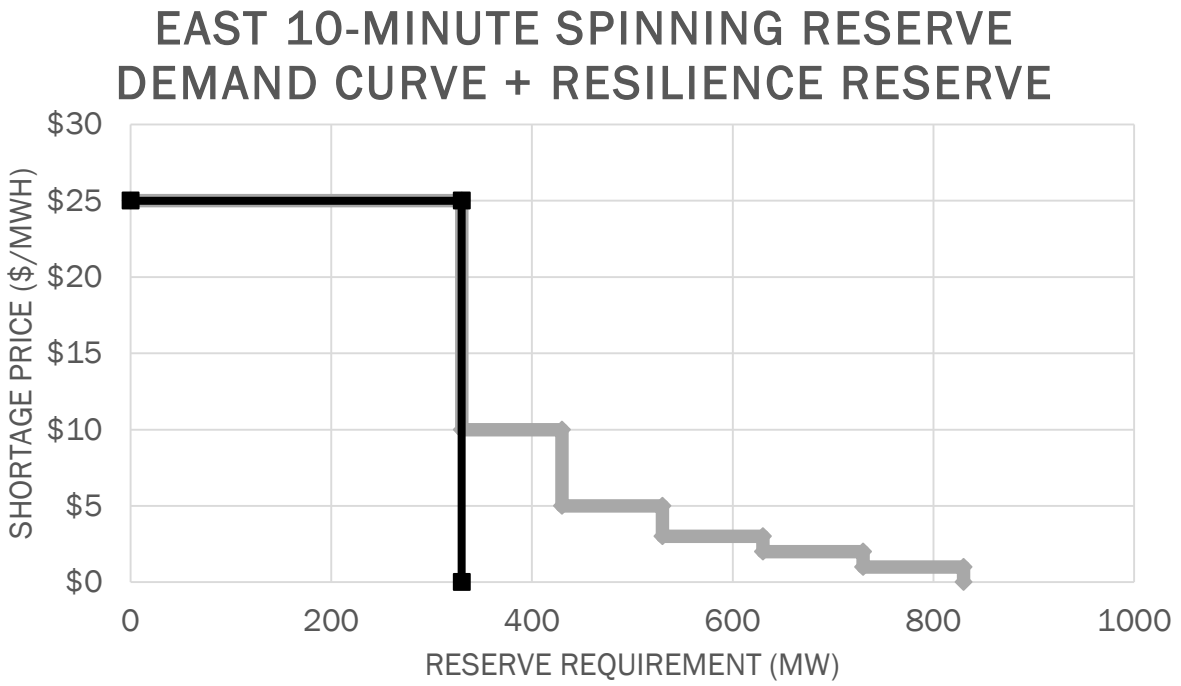
Example

- East 10 Minute Spinning Reserve Demand Curve
  - 330 MW at $25



Example

- East 10 Minute Spinning Reserve Demand Curve
  - 330 MW at $25
  - 100 MW at $10
  - 100 MW at $5
  - 100 MW at $3
  - 100 MW at $2
  - 100 MW at $1



Timeline

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- **May 31, 2018**
  - Continue to discuss Ancillary Services Shortage Pricing with stakeholders
- **June 13, 2018**
  - Continue to discuss Reserve Procurement for Resilience with Stakeholders
  - Present Master Plan

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system

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