Market Design Concepts to Prepare for Significant Renewable Generation

Ancillary Services Shortage Pricing

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Market Issues Working Group

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Agenda

- Background
- Ancillary Services Shortage Pricing at Neighboring ISOs/RTOs
  - ISONE
  - PJM
- Capacity Market Performance Incentives at Neighboring ISOs/RTOs
  - ISONE
  - PJM
- Looking to the Future
- Timeline
- Appendix: Previous Presentations for the Integrating Public Policy (IPP) Initiative

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.

Background

- Ancillary Services Shortage Pricing incents market participants to offer more flexibility and responsiveness in RT.
  - In response to the anticipated increases in future system volatility and importance of ancillary services, as well as recent capacity market performance rules in other ISOs/RTOs, the NYISO and its stakeholders should consider:
    - A re-evaluation of shortage pricing values for each product relative to other products
    - The potential need to increase certain shortage pricing values
    - The potential implementation of more gradual steps in the demand curves for ancillary services

Ancillary Services Shortage Pricing at Neighboring ISOs/RTOs

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ISONE – Reserve Shortage Pricing

- **If all four reserve constraints were violating in the system and reserve zone, then the maximum reserve price would be $2,800/MWh**
  - Local 30-Minute Operating Reserve (TMOR)
    - $250/MWh
  - System 30-Minute Operating Reserve (TMOR)
    - Minimum TMOR $1,000/MWh
    - Replacement Reserve $250/MWh (does not cascade with other reserve shortage prices)
  - System 10-Minute Nonsynchronized Reserve (TMNSR)
    - $1,500/MWh
  - System 10-Minute Spinning Reserve (TMSR)
    - $50/MWh

PJM- Reserve Shortage Pricing

- **If short of both Synchronous and Primary Reserve, the maximum reserve price would be $1,700/MWh**
  - Primary Reserve (10 minute synchronized and 10 minute non-synchronized reserve)
    - $850/MWh
  - Synchronous Reserve (10 minute spinning)
    - $850/MWh
  - 190 MW (plus optional additional reserves for reliability) at $300/MWh applies to both synchronized reserve and primary reserve

NYISO – Reserve Shortage Pricing

- NYISO's highest reserve demand curve values

Reserve Product	NYCA	EAST	SENY	LI
Spin	S.P. 3 = $775	S.P. 6 = $25	S.P. 9 = $25	S.P. 12 = $25
10-Minute Total	S.P. 2 = $750	S.P. 5 = $775	S.P. 8 = $25	S.P. 11 = $25
30-Minute	S.P.* 1 = $750	S.P. 4 = $25	S.P. 7 = $500	S.P. 10 = $25

- NYISO's highest cascaded reserve clearing prices

Reserve Product	NYCA	EAST	SENY	LI
Spin	$2,275	$3,100	$3,650	$3,725
10-Minute Total	$1,500	$2,300	$2,825	$2,875
30-Minute	$750	$775	$1,275	$1,300

*S.P. stands for "Shadow Price" in this table

Regulation Service

- ISONE Regulation $100/MWh
- PJM Regulation $100/MWh
- NYISO Regulation
  - 25 MW at $25/MWh
  - 80 MW at $525/MWh
  - Remainder at $775/MWh

Capacity Market Performance Incentives at Neighboring ISOs/RTOs

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Capacity Market Performance Incentives

- Neighboring ISOs/RTOs have introduced capacity market performance incentives that are expected to financially reward resource performance during critical operating periods
  - Shortage pricing for ancillary services performs a similar function in the NYISO markets

Capacity Market Performance Incentives - Summary

	Capacity Market Performance Incentives	
	ISONE	PJM
Start Date	June 2018	June 2016
Effective	During operating reserve shortages	During emergency conditions
Price incorporated into LMP?	No	No
Load directly charged?	No	No
Who pays?	Under-performing capacity market resources	Under-performing capacity market resources
Who is paid?	Any over-performing resource	Any over-performing resource*
2017/2018 performance $/MWh rates	$2,000/MWh	$2,420.23/MWh

*Effective 2018/2019

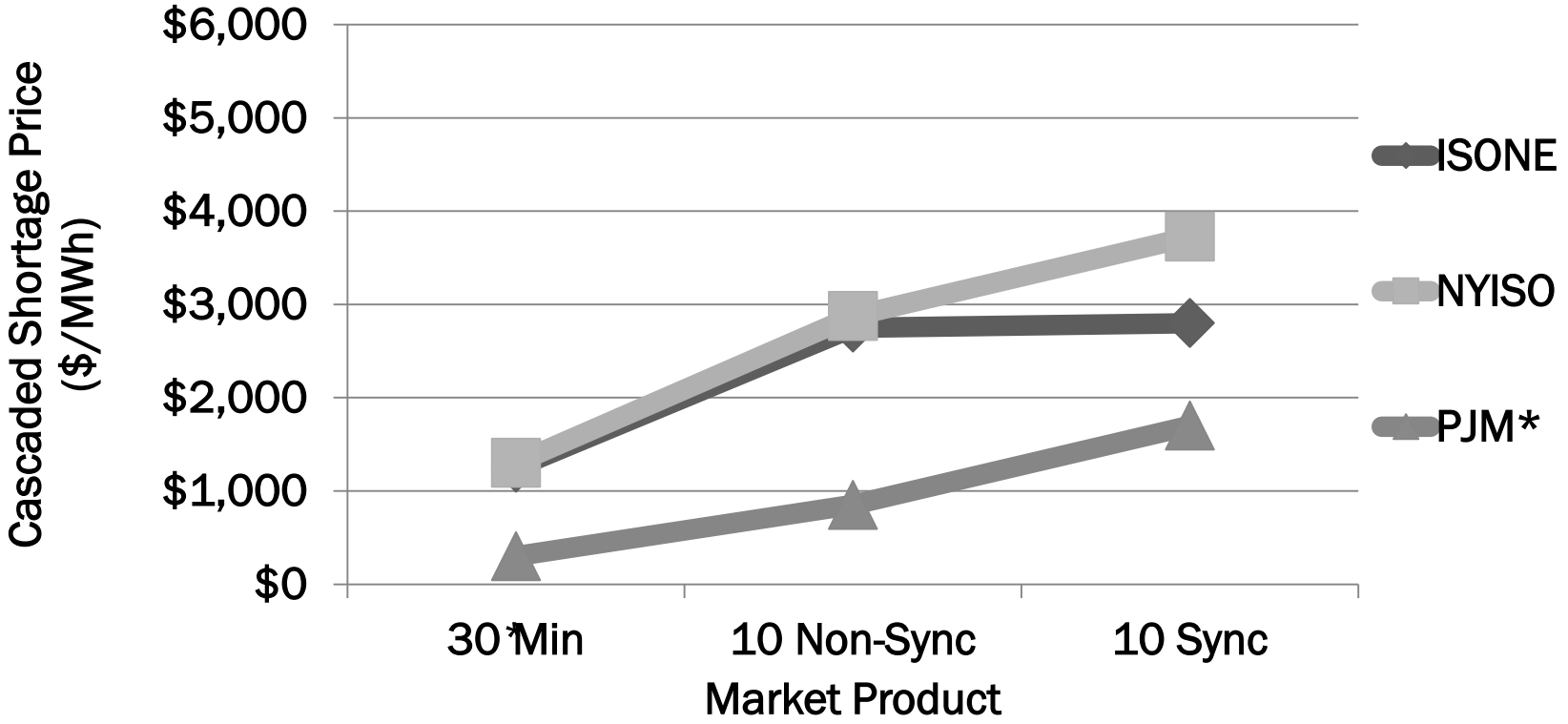
PJM Capacity Market Performance Incentives

- **Winter generator performance in 2014 highlighted a potentially significant reliability issue for PJM.**
  - Resource retirements expected in PJM were cause for concern.
- **PJM created the Capacity Performance product to ensure resources are available during emergency conditions.**
  - Resources are compensated or charged for their performance during these conditions.
  - Performance Shortfall MW are assessed when emergencies are declared by PJM.
  - Performance charge and payment rules were effective June 2016.
- **PJM Non-Performance Charges are assessed for the amount of Performance Shortfall MW.**
  - Non-Performance Charges in PJM are allocated to resources that have over-performed (pro-rata share of the total over-performance).
    - For the 2018/2019 years and beyond, all resources are eligible for payment (even if not a Capacity supplier).
  - Load is not charged or credited directly.

ISONE Capacity Market Performance Incentives

- **ISO-NE will also implement resource incentives during stressed system conditions through their Pay for Performance mechanism.**
  - Mechanism will be effective during operating reserve shortages.
  - Pay for Performance will be effective June 2018.
- **During a reserve shortage:**
  - A resource's capacity performance score will be calculated.
    - Score could be positive or negative.
  - This score and the Performance Payment Rate in effect will be used to compensate or charge resources.
    - Charges and credits are determined using the same Performance Payment Rate.
- **Capacity suppliers receive performance payments and pay performance charges separate from their energy market settlements.**
  - Suppliers not providing Capacity are only eligible to receive payments, and will not be obligated to pay performance charges.
  - Charges are collected from under-performers and used to pay over-performers.
  - Load is not charged or credited directly.

Reserve Shortage Pricing Comparison



*Price shown at 30 Minute for PJM is the first step of the Primary Reserve product

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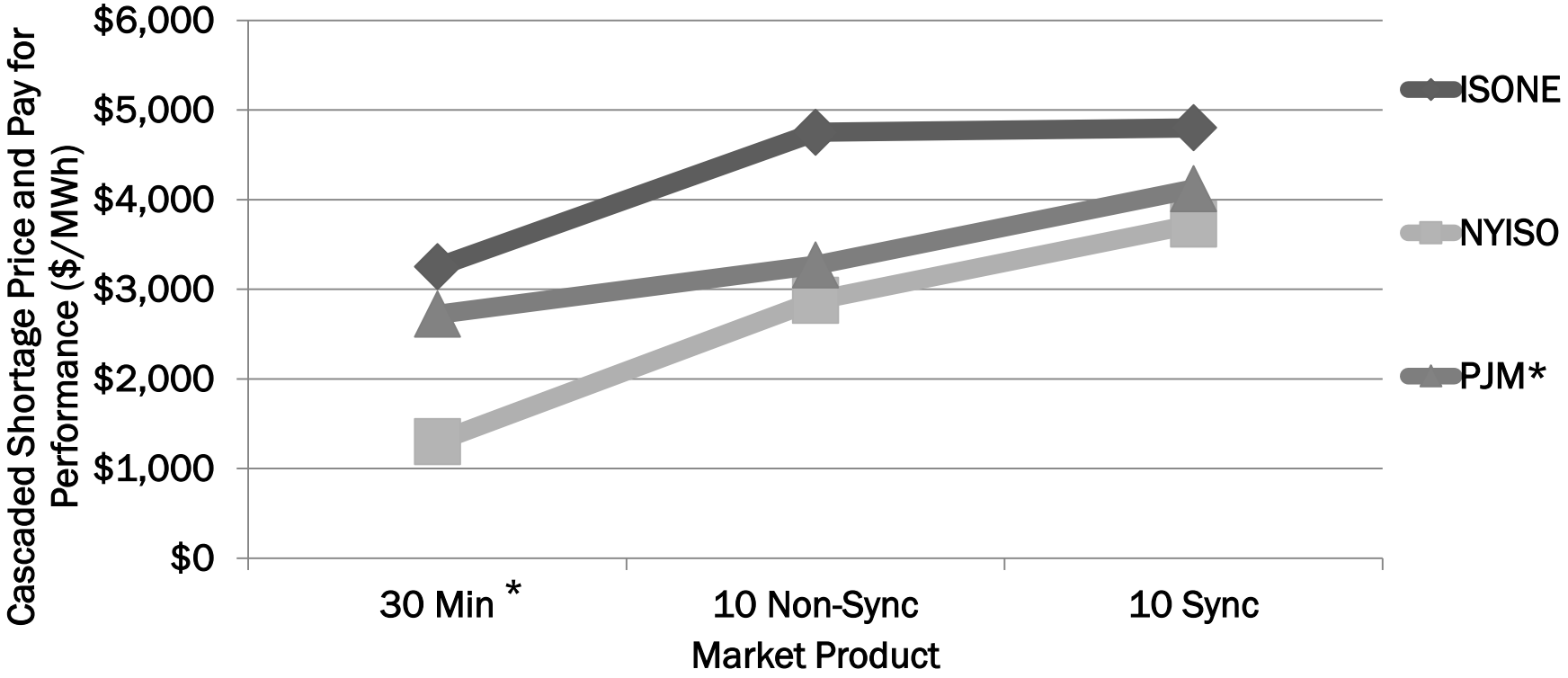
Reserve Shortage Pricing and Pay for Performance Comparison (2017/2018)



*Price shown at 30 Minute for PJM is the first step of the Primary Reserve product

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Pay for Performance at Other ISOs/RTOs

- **ISO-NE will use a Performance Payment Rate that is gradually raised until 2024:**
  - 2018-2021: $2,000/MWh
  - 2021-2024: $3,500/MWh
  - 2024 onward: $5,455/MWh
- **PJM will use a calculation to determine a Non-Performance Charge Rate (NPCR) that is distributed from non-performers to performers.**
  - For 2017/2018, the NPCR is $2,420.23/MWh

Looking to the Future

Looking to the Future

- **Ancillary service shortage pricing incents availability of resources in preparation for increased renewable generation.**
  - Resources are incented to provide reserve and ultimately energy if necessary.
- **Capacity market performance incentives at neighboring ISOs/RTOs will become more inconsistent with the NYISO's current shortage pricing levels in the future.**
  - Potomac Economics is supportive of the NYISO evaluating ancillary services shortage pricing due to ISONE and PJM's capacity market performance incentives.
  - Further experience with capacity market performance incentives at ISONE and PJM are necessary to inform the prioritization of this effort.
- **The NYISO recommends that its stakeholders consider evaluating ancillary services shortage pricing after 2019 to maintain resource availability.**
  - The NYISO looks forward to stakeholder feedback regarding the Ancillary Services Shortage Pricing project.

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Timeline

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- **May 23, 2018**
  - Continue discussions regarding the draft outline of the Master Plan with stakeholders
- **May 31, 2018**
  - Continue to discuss Ancillary Services Shortage Pricing initiative with stakeholders
- **June 13, 2018**
  - 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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