

Ancillary Services Shortage Pricing

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Agenda

- **Background**
- **Proposed Reserve Demand Curve Enhancements**
- **Overview of Procuring Additional Reserves**
- **Next Steps**

Background

A Grid in Transition – The Plan

- Carbon Pricing
- Comprehensive Mitigation Review
- DER Participation Model
- Energy Storage Participation Model
- Hybrid Storage Model

Aligning Competitive Markets and New York State Clean Energy Objectives



- Enhancing Energy & Shortage Pricing
 - Ancillary Services Shortage Pricing
 - Constraint Specific Transmission Shortage Pricing
 - Enhanced Fast Start Pricing
- Review Energy & Ancillary Services Product Design
 - More Granular Operating Reserves
 - Reserve Enhancements for Constrained Areas
 - Reserves for Resource Flexibility

Valuing Resource & Grid Flexibility



- Enhancements to Resource Adequacy Models
- Revise Resource Capacity Ratings to Reflect Reliability Contribution
 - Expanding Capacity Eligibility
 - Tailored Availability Metric
- Capacity Demand Curve Adjustments

Improving Capacity Market Valuation



Previous Presentations

Date	Working Group	Discussion points and links to materials
12-05-19	ICAPWG/MIWG	<p data-bbox="768 312 1387 339">Ancillary Services Shortage Pricing - Study Report</p> <p data-bbox="768 345 1812 405">https://www.nyiso.com/documents/20142/9622070/Ancillary%20Services%20Shortage%20Pricing_study%20report.pdf/15fb5f26-e1af-fa5a-ee29-3943ab483369</p> <p data-bbox="768 432 1676 459">Ancillary Services Shortage Pricing - Study Report Overview(presentation)</p> <p data-bbox="768 465 1812 558">https://www.nyiso.com/documents/20142/9622070/Ancillary%20Services%20Shortage%20Pricing_study%20overview_12_5_MIWG.pdf/99b7c720-ba5d-f656-01e4-4fd54a930d4b</p>
04-07-20	ICAPWG/MIWG	<p data-bbox="768 585 1715 612">Ancillary Services Shortage Pricing - Reserve Demand Curve Enhancements</p> <p data-bbox="768 618 1812 678">https://www.nyiso.com/documents/20142/11759586/Ancillary%20Services%20Shortage%20Pricing%20MIWG%2004072020.pdf/bf7106a3-c817-db1e-97a2-bf53baa5ad96</p>

Ancillary Services Shortage Pricing

- **This is a continuation of a 2019 project**
 - In December 2019, NYISO published a report that evaluated the appropriateness of revising the structure of the current reserve demand curves (including additional, more granular steps).
- **2020 Project Goal : Market Design Complete- Q2, 2020**

Project Overview

- **This project consists of two primary components:**
 - Revisions to the current reserve demand curves (initially presented on April 7, 2020)
 - Adjustments to shortage pricing values
 - Additional “steps” for a more graduated demand curve for NYCA 30-minute reserves
 - The NYISO’s recommendations for enhancements are addressed in this presentation
 - Procurement of additional reserves beyond minimum reliability requirements
 - This concept was previously discussed as part of the Reserves for Resource Flexibility project efforts
 - An initial overview related to this component will be discussed today, and will be addressed in future presentations
- **This project will also evaluate the structure of the NYCA 30-minute reserve demand curve that applies in real-time during SCR/EDRP activations of less than all zones**
 - This will not be discussed today, and will be addressed in a future presentation

Proposed Reserve Demand Curve Enhancements

Reserve Demand Curve Enhancements

- **Proposed revisions to the values and steps of the current reserve demand curves are intended to:**
 - Ensure continued compliance with applicable reliability requirements
 - Account for more recent data and information regarding resource operating costs
 - Provide targeted market signals that align with actual reliability needs of the NYCA at times when actions are being taken to maintain reliability
 - Provide appropriate locational price signals to incentivize resources to include/maintain capability to provide reserves when and where needed
 - Maintain consistency with actions taken by operators to maintain system reliability

Considerations for Shortage Pricing Values

- Shortage pricing values should be set at levels that are consistent with operator actions to maintain reliability.
- In evaluating the current shortage pricing values, the NYISO has considered the following:
 - Cost of resources capable of providing reserves on peak load days
 - Cost of demand reductions from SCR/EDRP activations
 - Cost of Supplement Resource Evaluation (SRE) commitments
 - Cost of out-of-merit (OOM) actions to commit fast-start resources
 - Re-run of certain Real-Time Commitment (RTC) cases

Overview of Proposed Enhancements (Updated)

Reserve Region	Reserve Product	Reserve Reqt.	Demand curve (\$/MWh)		Rationale
			Current	Proposed	
NYCA	30-minute	2,620 MW	300 MW at \$25/MWh	200 MW at \$40/MWh	Allow a portion of the 30 minute total reserves to be forgone against price volatility
			-	125 MW at \$100/MWh	Facilitate reduction of unnecessary price volatility by further graduation of the NYCA 30-minute reserve demand curve
			355 MW at \$100/MWh	55 MW at \$175/MWh	Consistent with cost of operator actions to maintain 30-minute reserves (GT OOMs)
			-	55 MW at \$225/MWh	Consistent with cost of operator actions to maintain 30-minute reserves (SREs)
			300 MW at \$200/MWh	55 MW at \$300/MWh	Facilitate reduction of unnecessary price volatility by further graduation of the NYCA 30-minute reserve demand curve
			-	55 MW at \$375/MWh	Represents a value aligned with the average cost of 99% of the resource costs observed for historic SRE and OOM commitments
			-	55 MW at \$500/MWh	Consistent with cost of activating SCR/EDRP resources to maintain reserves
			-	55 MW at \$625/MWh	Facilitate reduction of unnecessary price volatility by further graduation of the NYCA 30-minute reserve demand curve
		1,665 MW at \$750/MWh	1,965 MW at \$750/MWh	Consistent with cost of operator actions to replenish by converting 30 min GTs to energy	
NYCA	10 minute total	1,310 MW	\$750/MWh	\$750/MWh	Consistent with cost of operator actions to replenish by converting 30 min GTs to energy
NYCA	10 minute spin	655 MW	\$775/MWh	\$775/MWh	Provide scheduling priority to NYCA 10-minute total and NYCA 30-minute reserves
EAST	30-minute	1,200 MW	\$25/MWh	\$40/MWh	Facilitates distribution of reserves throughout NYCA
EAST	10 minute total	1,200 MW	\$775/MWh	\$775/MWh	Recognizes equal importance with NYCA 10-min spinning reserves
EAST	10 minute spin	330 MW	\$25/MWh	\$40/MWh	Facilitates distribution of reserves throughout NYCA

* Updates from the April 7, 2020 presentation noted in red text

Overview of Proposed Enhancements (Updated)

Reserve Region	Reserve Product	Reserve Reqt.	Demand curve (\$/MWh)		Rationale
			Current	Proposed	
SENY	30-minute	1,800 MW	500 MW at \$25/MWh (proposed)	500 MW at \$40/MWh	Additional reserves to facilitate returning transmission assets to Normal Transfer Criteria following a contingency (see Reserves for Resource Flexibility project)
			1,300 MW at \$500/MWh	1,300 MW at \$500/MWh	Consistent with cost of activating SCR/EDRP resources to maintain reserves
NYC	30-minute	1,000 MW	\$25/MWh	\$25/MWh	Facilitates distribution of reserves throughout NYCA
NYC	10-minute total	500 MW	\$25/MWh	\$25/MWh	Facilitates distribution of reserves throughout NYCA
LI	30-minute	270-540 MW	\$25/MWh	\$25/MWh	Facilitates distribution of reserves throughout NYCA
LI	10-minute total	120 MW	\$25/MWh	\$25/MWh	Facilitates distribution of reserves throughout NYCA

*Updates from the April 7, 2020 presentation noted in red text

Re-run of RTC Cases

- **The 2019 Ancillary Services Shortage Pricing study identified that the highest number of reserve shortages occurred with respect to East spinning reserves**
 - The current demand curve price for East spinning reserves is \$25/MWh
 - The \$25/MWh demand curve price also applies to NYCA 30-minute, EAST 30-minute, NYC 30-minute, NYC 10-minute total, LI 30-minute and LI 10-minute total
- **The NYISO is evaluating RTC re-run cases with different demand curve values from July 2019- March 2020 to determine a pricing level at which re-dispatch occurs to resolve the shortages.**
 - Initial re-run results indicate that a price of \$40/MWh facilitates re-dispatch to resolve or minimize otherwise observed shortages for various products and locations (e.g., East spin, NYCA 30-minute)
 - Results indicate that absent market power/mitigation concerns, it may be appropriate to increase all existing \$25/MWh values to \$40/MWh

Re-run of RTC Cases

- **The NYISO evaluated whether increasing the \$25/MWh value to \$40/MWh would present any market power/mitigation concerns for any of the applicable reserve regions and/or products**
 - This evaluation identified potential concerns for NYC and LI due to limited number of eligible suppliers in these reserve regions
 - As a result, the NYISO does not propose to increase \$25/MWh shortage pricing values for these reserve regions to \$40/MWh
- **The NYISO proposes to increase the current \$25/MWh value to \$40/MWh for all applicable products an reserve regions other than NYC and LI**
 - Existing reserve products to be adjusted: NYCA 30-minute reserves, East spinning reserves, and East 30-minute reserves
 - The NYISO proposes to extend this increase to the additional 500 MW of SENY 30-minute reserves proposed to be procured under the Reserves for Resource Flexibility project (presented on April 22, 2020)
 - The Reserves for Resource Flexibility project proposes an initial \$25/MWh shortage pricing value for these additional SENY 30-minute reserves; this value would be increased to \$40/MWh upon implementation of the enhancements proposed as part of this project

NYCA 30-Minute Reserve Demand Curve Structure

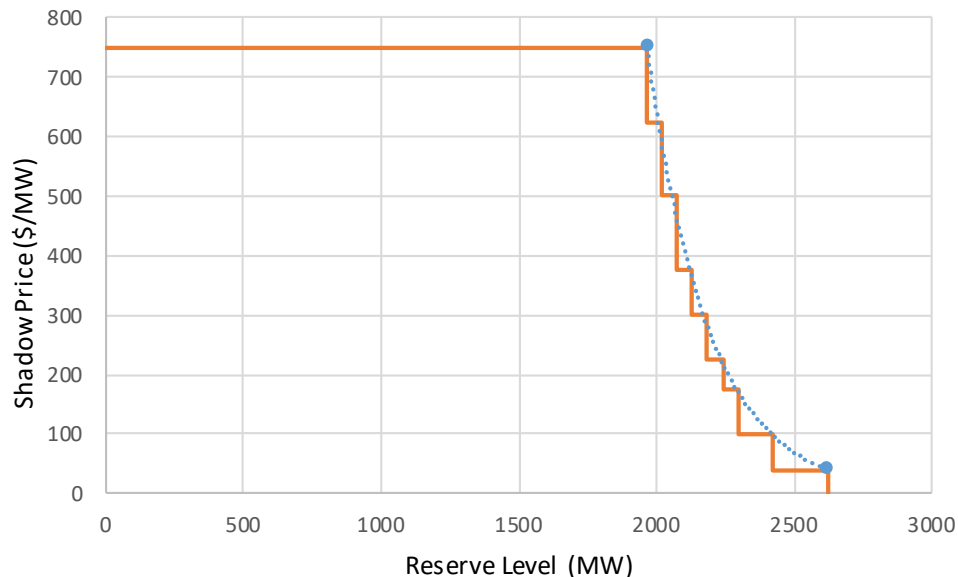
- **The NYISO is proposing to add additional pricing steps based on seeking to smooth the relative magnitude of changes among the various steps**
 - MW quantities assigned to the various price points are based on the overall intent of reducing the magnitude of step changes throughout the NYCA 30-minute reserve demand curve
 - Further graduation of the NYCA 30-minute reserve demand curve could help to reduce price volatility and provide the market software greater degrees of freedom in determining the least cost solution to meet system needs
 - Slides 16-17 provide additional details regarding the NYISO's proposal to revise the current

Proposed NYCA 30-minute Reserve Demand Curve

- **Based on the NYSRC rules, the NYCA 30-minute requirement of 2,620 MW addresses the following:**
 - 1.5 times the single largest contingency ($1.5 \times 1,310 = 1,965$ MW)
 - Following a contingency, 10-minute operating reserve shall be restored within 30 minutes
 - NYCA 10-minute reserve requirement = 1,310 MW.
 - 1965 MW covers a portion of the additional 1,310 MW needed to meet this requirement ($1,965 - 1,310 = 655$ MW)
 - Additional 655 MW is required to address this rule bringing the NYCA 30-minute requirement to 2,620 MW ($1,965 + 655 = 2,620$ MW)
- **The binding NYSRC requirement relates to 1,965 MW. Thus, NYISO operators would seek to avoid reserves falling below the 1.5 x largest single contingency component of the requirement.**
- **Therefore, the NYISO proposes to price this 1,965 MW portion of the total statewide reserve requirement at \$750/MWh**
- **For the remaining 655 MW of 30-minute reserves, the NYISO proposes to utilize a stepped approximation of an exponential curve to help smooth the NYCA 30-minute reserve demand curve**
 - An exponential curve was used because, as available reserves approach 1,965 MW, the operators are more likely to take actions to maintain system reliability
 - The cost of various operator actions that may be taken to maintain reliability were utilized in developing the exponential curve construct

Exponential Curve Construct Analysis

NYCA 30-Minute Reserve Demand Curve



Shortage Price (\$/MW)	Reserve Level (MW)	Demand Curve (MW)
750	$\leq 1,965$ to 0	1,965
625	1,965 to 2,020	55
500	2,020 to 2,075	55
375	2,075 to 2,130	55
300	2,130 to 2,185	55
225	2,185 to 2,240	55
175	2,240 to 2,295	55
100	2,295 to 2,420	125
40	2,420 to 2,620	200

Note:

- Highlighted shortage price cells indicate the values from the costs of operator actions analysis

Considerations for Procuring Additional Reserves

Procuring Reserves Beyond Minimum Requirements

- **The NYISO will discuss procuring additional reserves for system uncertainty within the scope of this project.**
 - Procuring additional reserve beyond minimum requirements should be considered along with the potential adjustments to the existing reserve demand curves.
 - Additional reserve procurements can help provide ready access to capability to account for system uncertainty introduced by weather-dependent resources (distributed and grid-connected), as well as potentially volatile load
- **The NYISO is evaluating the best approach to determine additional reserve procurement requirements**
 - Additional reserve procurement requirements could potentially be informed by evaluating using the “Net Load Forecast” error method to determine these requirements
 - “Net Load Forecast” error evaluation has previously been used to inform regulation service requirements
- **The NYISO is also continuing to evaluate the appropriate timeframe for implementing additional reserve procurement requirements and potentially modifying such requirements over time as the grid evolution continues to unfold**

Next Steps

- **May 2020**
 - Continue to discuss procuring additional reserves proposal
 - Continue to discuss proposed reserve demand curve enhancements
 - Present Consumer Impact Analysis methodology
- **May/June 2020**
 - Continue to discuss proposal
 - Present Consumer Impact Analysis
- **June/July 2020**
 - Seek stakeholder approval of proposal at BIC and MC
- **2021**
 - Currently targeted timeframe to develop the necessary software
- **2022**
 - Currently targeted timeframe to implement the proposed enhancements

Questions?

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit 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 policymakers, stakeholders and investors in the power system

