

Comprehensive Shortage Pricing

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MIWG

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Krey Corporate Center*

Agenda

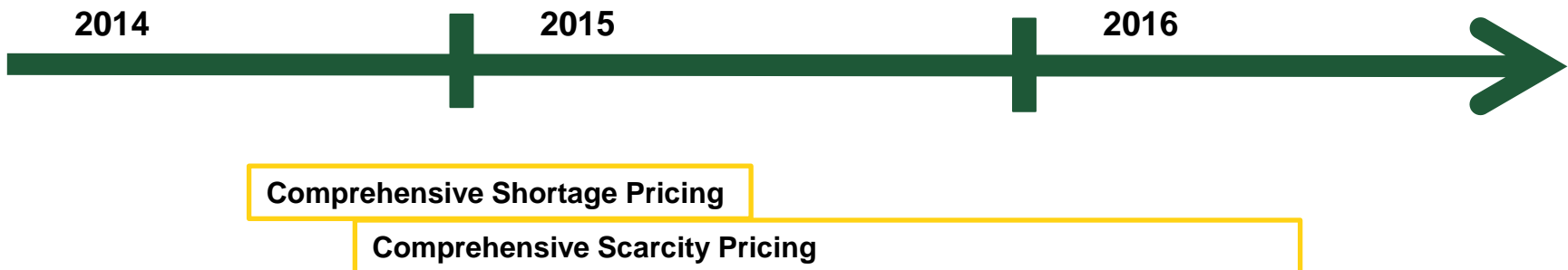
- ◆ **Scarcity & Shortage Pricing**
- ◆ **Comprehensive Shortage Pricing Overview**
- ◆ **Benefits**
- ◆ **SENY and NYCA Reserve Proposal**
- ◆ **Critical Operating Day**
- ◆ **Shortage Pricing**
- ◆ **Existing Shortage Pricing**
- ◆ **Proposed Shortage Pricing**
- ◆ **ISO/RTO Comparison**
- ◆ **Timeline**

Scarcity & Shortage Pricing

- ◆ **Scarcity and Shortage prices should incent the correct short term and long term desired responses from all energy resources, but not to the detriment of regions short on electricity supply when region-wide shortages occur**
- ◆ **Scarcity and Shortage pricing should be coordinated to ensure that the pricing signals align with actions taken to maintain NYCA reliability**
 - *Market prices should reinforce/support operator actions required to maintain reliability*
 - *Resources should be provided the correct incentives to follow NYISO instructions for meeting NYCA reliability*

Scarcity & Shortage Pricing

- ◆ Both the Comprehensive Shortage Pricing and Comprehensive Scarcity Pricing efforts will increase the effectiveness of shortage and scarcity pricing, respectively
 - *Shortage pricing utilizes demand curves to reflect the gradually increasing value of reserves, regulation, and transmission as the grid becomes more constrained*
 - *Scarcity pricing ensures the market reflects the value of EDRP/SCR resources when those resources are necessary to maintain 30 minute reserves*
- ◆ Today’s discussion focuses on the Comprehensive Shortage Pricing effort



Comprehensive Shortage Pricing Overview

- ◆ **Comprehensive Shortage Pricing supports the NYISO’s Fuel Assurance Initiative and includes:**
 - *Modeling a SENY reserve region*
 - *Revising the NYCA Total Reserve procurement*
 - *Defining Critical Operating Day(s)*
 - *Revising reserve, transmission, and regulation shortage pricing*

Fuel Assurance Initiative

Incent
Intra-day
Operational
Flexibility

Promote
Increased
Resource
Availability
and
Performance

The NYISO’s Efforts

Capacity Market

- *Ways to better incent and reflect performance*
- *Possible Summer/Winter EFORd*
- ...

Energy Market

- ***Comprehensive Shortage Pricing***
- *Comprehensive Scarcity Pricing*
- *RLS Changes*
- ...

Gas-Electric Coordination

- *EMS Visualization of Gas System*
- *Gas Operational Information Sharing*
- *Fuel Availability Self Reporting project*
- ...

Benefits

- ◆ **Properly designed Scarcity and Shortage pricing rules will allow the New York energy markets to:**
 - *Provide targeted market signals that align with actual reliability needs of the NYCA at times when actions are being taken to maintain reliability*
 - *Create incentives for investment in the areas that need it most, including fuel assurance investment*
 - *Reduce the “missing money” covered by capacity payments*
 - This facilitates a more level playing field for resources that are more dependent on energy revenues to compete in the New York electricity markets
 - *Promote additional response from demand response and distributed energy providers*

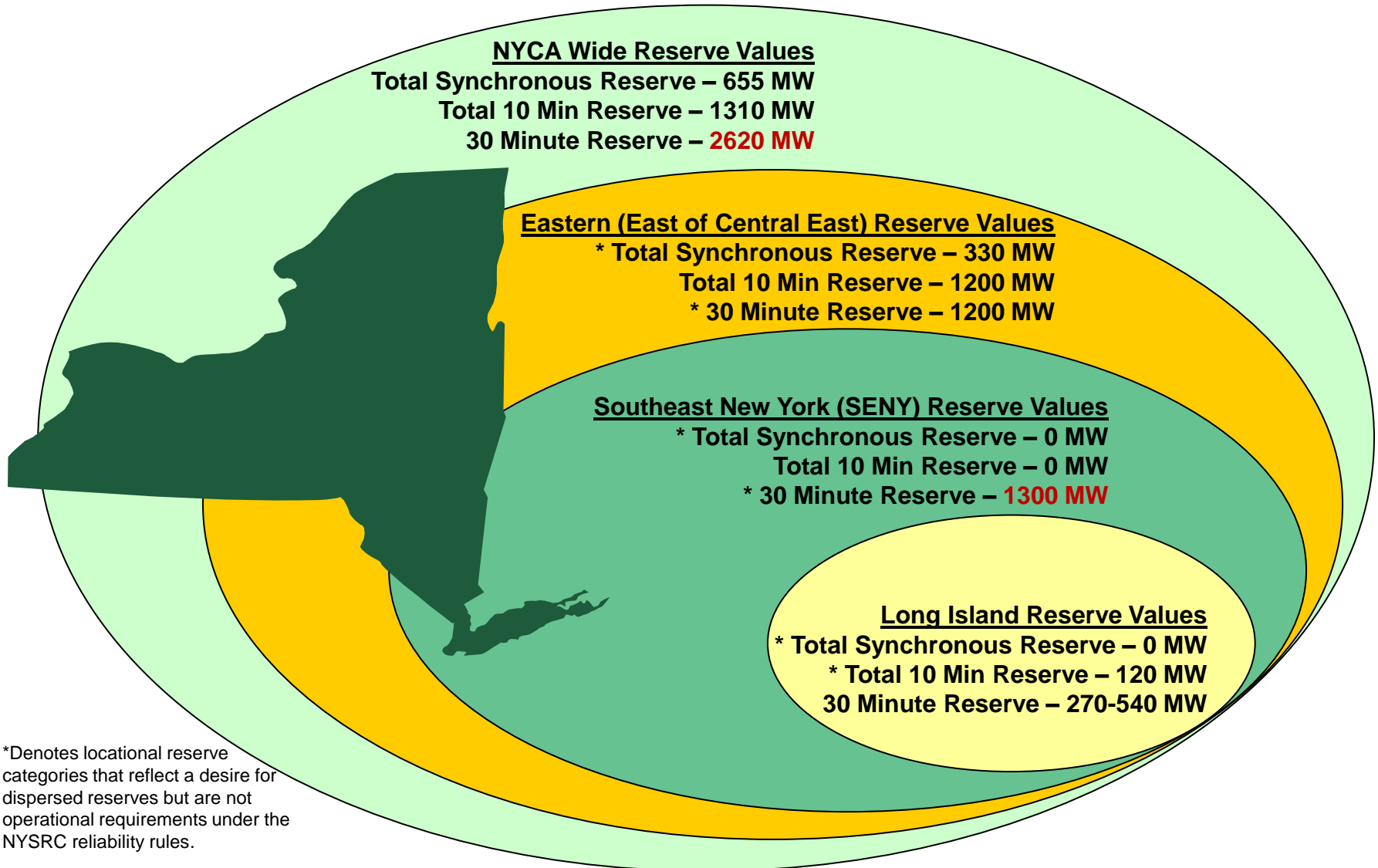
SENY and NYCA Reserve Proposal

- ◆ Properly defined reserve regions increase the likelihood reserves will be deliverable when needed, thus increasing system reliability
 - *Reserves should be available in the area of need*
 - *Appropriate price signals are sent to incent reserve availability within the defined reserve region*
- ◆ Southeast New York (SENY) constraints can prevent eastern operating reserves from being available in the southeast New York load centers
 - *Additional reserve areas and reserve quantities need to be considered to address this reliability need*
- ◆ Potomac Economics supports a market requirement to reflect SENY's 30-minute reserve needs (Q3 2013 SOM)

SENY and NYCA Reserve Proposal

- ◆ Keep current NYCA, East, and LI regions
- ◆ Define SENY reserve region within East due to Hudson Valley transmission constraints that often bind separately from Central East interface constraints
- ◆ The SENY reserve region would include zones G-K with a 30 Minute Total Reserve requirement of 1300MWs
 - *Requirement is based on the amount of reserves necessary to restore SENY power flows to within applicable transmission limits following a contingency event*
 - *SENY reserves will be procured every market day*
- ◆ Additionally, the NYCA 30 Minute Total Reserve requirement will be updated to 2620MWs
 - *This adjustment ensures NYCA reliability to re-establish 10 minute operating reserves following the loss of single largest supply contingency*
 - *The additional NYCA reserves will be procured every market day*

NYCA Reserve Regions



*Denotes locational reserve categories that reflect a desire for dispersed reserves but are not operational requirements under the NYSRC reliability rules.

Critical Operating Days

- ◆ On a best efforts basis, NYISO Operations will declare Critical Operating Days two days prior to the Operating Day
 - *Should system conditions warrant, Critical Operating Days may be declared day ahead or in real-time*
 - *The NYISO will notify the marketplace when Critical Operating Days are declared*
- ◆ Conditions which may be considered to identify a critical operating day
 - *Forecasted load levels*
 - *Forecasted reserve deficiencies*
 - *SCR Day -Ahead Advisories*
- ◆ When Critical Operating Days are declared the NYISO will adjust the NYCA and SENY 30 minute reserve shortage pricing levels to be consistent with the actions that NYISO Operations anticipates will be needed

Shortage Pricing

- ◆ **Scarcity and Shortage pricing should be coordinated to ensure that the pricing signals align with actions taken to maintain NYCA reliability**
 - *Market prices should reinforce/support operator actions required to maintain reliability*
 - *Resources should be provided the correct incentives to follow NYISO instructions for meeting NYCA reliability*
- ◆ **EDRP/SCR resources are used to protect Operating Reserves**
 - *Shortage Pricing of Operating Reserves should account for this market action*

Shortage Pricing

Elements Driving Shortage Pricing Updates

- ◆ **Potomac Economics recommends adjusting the 30 minute reserve shortage prices to better align with the cost of operator actions**
- ◆ **The SCR Obligation Proposal to increase the largest Minimum Payment Nomination of a SCR from \$500/MWh to \$750/MWh**
- ◆ **EDRP/SCR activations are often used to protect reserves**
 - *Therefore the current reserve demand curve prices should be updated to ensure that Operating Reserves are properly aligned with scarcity pricing*

Existing Shortage Pricing

◆ The current* demand curve prices will need to be updated to reflect the following:

- *Addition of a SENY reserve region*
- *Definition of Critical Operating Days*
- *SCR largest Minimum Payment Nomination*

Current Demand Curve Prices	
Reserve Region	10 Min Synch
NYCA	\$500
EAST	\$25
LI	\$25
Reserve Region	10 Min Total
NYCA	\$450
EAST	\$500
LI	\$25
Reserve Region	30 Min Total
NYCA	200 MW at \$50
	200 MW at \$100
	200 MW at \$200
EAST	\$25
LI	\$25
Reserve Region	Regulation
NYCA	<=25 MW at \$80
	>25 and <=80 MW at \$180
	>80 MW at \$400
Reserve Region	Transmission Shortage
NYCA	<=5 MW at \$350
	>5 and <=20 MW at \$1,175
	>20 MW at \$4,000

* The Transmission Shortage Costs are effective Q4 2014 pending FERC approval

Proposed Shortage Pricing

- ◆ Reserve demand curve prices in **red** apply only during critical operating days

Proposed Reserve Demand Curve Prices		
Reserve Region	10 Min Synch	Rationale
<i>NYCA</i>	\$775	10 Min Synch reserves are equally important to maintaining 10 minute reserves in the EAST
<i>EAST</i>	\$25	Facilitates distribution of reserves throughout NY
<i>SENY</i>	\$25	Facilitates distribution of reserves throughout NY
<i>LI</i>	\$25	Facilitates distribution of reserves throughout NY
Reserve Region	10 Min Total	Rationale
<i>NYCA</i>	\$750	Cost to replenish by converting 30 Min GTs to energy, consistent with operator actions
<i>EAST</i>	\$775	10 Min reserves for Central East post-contingency voltage IROL exceedence
<i>SENY</i>	\$25	Facilitates distribution of reserves throughout NY
<i>LI</i>	\$25	Facilitates distribution of reserves throughout NY
Reserve Region	30 Min Total	Rationale
<i>NYCA</i>	300 MW @ \$25/ \$125	Allow a portion of the increased 30 Min Total reserves to be forgone to protect against price volatility
	355 MW @ \$100/ \$300	Consistent with operator actions to maintain 30 minute reserves (GT OOMs)
	300 MW @ \$200/ \$750	Consistent with operator actions to maintain 30 minute reserves (SREs)
	355 MW @ \$750	Consistent with operator actions to maintain 30 minute reserves (SCRs)
<i>EAST</i>	\$25	Facilitates distribution of reserves throughout NY
<i>SENY</i>	\$25/ \$750	Facilitates distribution of reserves throughout NY and maintains consistency with operator actions to maintain 30 minute reserves during SCR activations
<i>LI</i>	\$25	Facilitates distribution of reserves throughout NY

Proposed Shortage Pricing

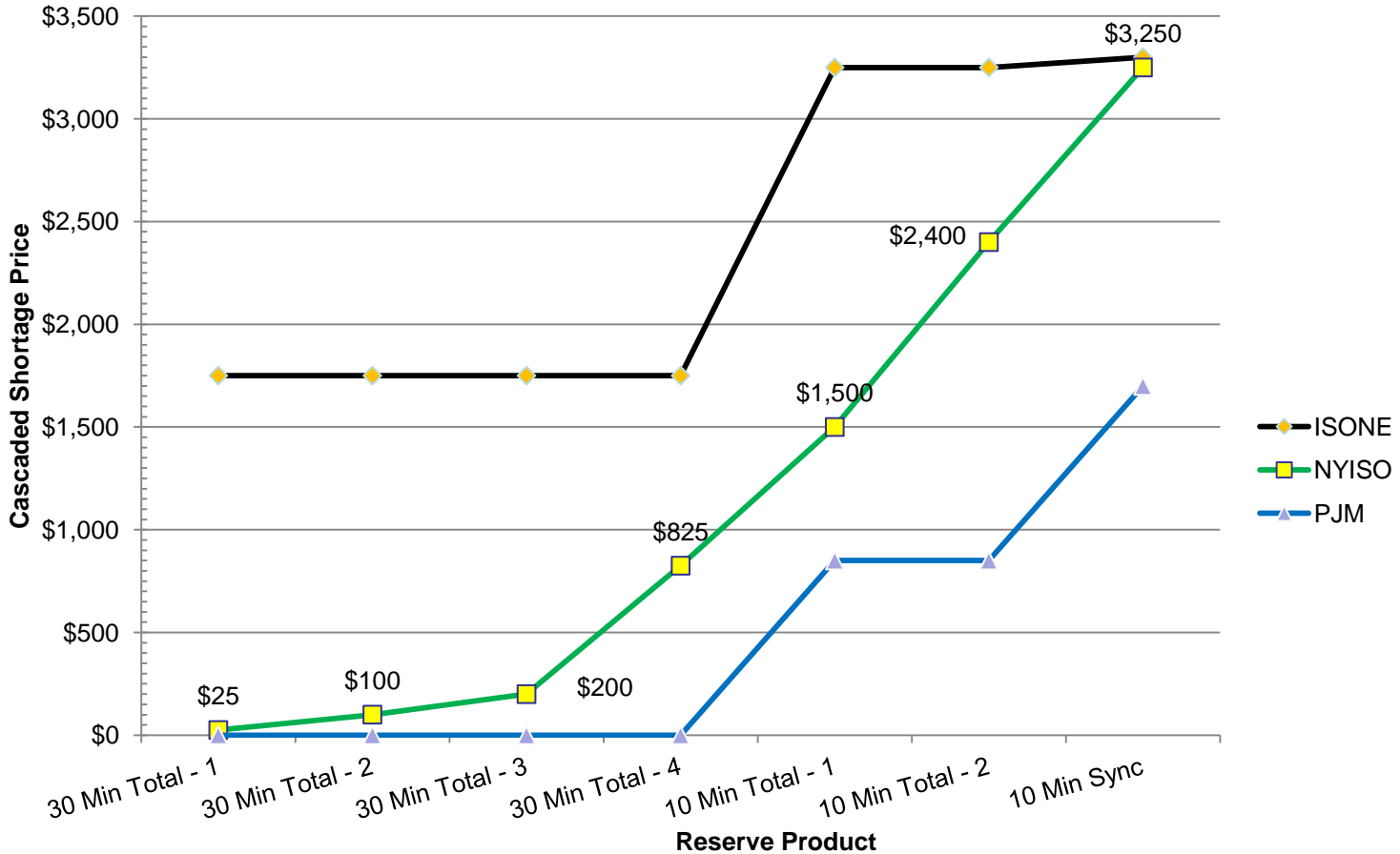
- ◆ Proposed Regulation Service Demand Curve and Transmission Shortage Costs

Proposed Regulation Service Demand Curve Prices		
Reserve Region	Regulation	Rationale
NYCA	<=25 MW @ \$25	Provide additional ramp flexibility for meeting gen-load balance and operating reserve constraints
	>25 and <=80 MW @ \$400	Maintain Regulation during small 30 minute reserve shortages; Regulation is more valuable than 30 minute reserves
	>80 MW @ \$775	Valued as much as 10 Min Synch to ensure some Regulation Service is procured because any unused Regulation Capacity can be counted as 10 Min Synch

Proposed Transmission Shortage Costs		
Reserve Region	Transmission Shortage	Rationale
NYCA	<=5 MW @ \$350	Approved for implementation in Q4 2014
	>5 and <=20 MW \$2350	Cascaded cost of going short East & SENY 10 Min Total
	>20 MW @\$4000	Approved for implementation in Q4 2014

ISO/RTO Comparison

Reserve Shortage Pricing Comparison



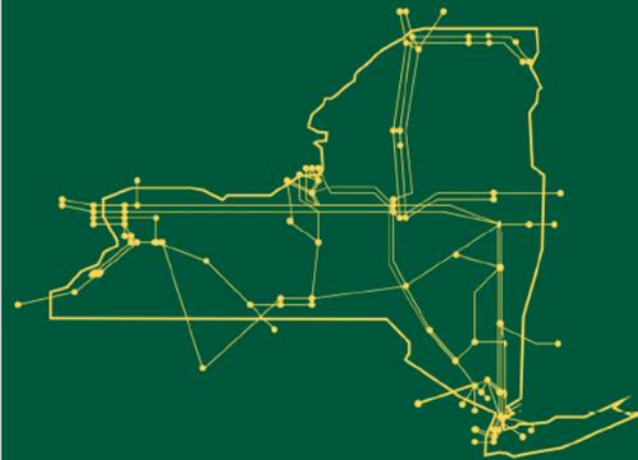
Note: NYISO Shortage Prices Reflect Normal Operating Day Levels

Timeline

- ✓ **June 2014 BIC**
 - ✓ *BIC endorsed the NYISO's proposal to continue review and further define recommendations*
- ◆ **August 26, 2014 MIWG**
 - *Propose SENY and NYCA Reserves*
 - *Define Critical Operating Day Usage*
 - *Propose revised shortage prices*
- ◆ **September 19, 2014 MIWG**
 - *Address questions/concerns raised by stakeholders*
 - *Propose scarcity pricing mechanism changes*
- ◆ **October – November 2014 MIWG**
 - *Continue to address questions/concerns raised by stakeholders*
 - *Work through tariff changes*
- ◆ **Fall/Winter 2014 BIC/MC – Request Endorsement**
- ◆ **Q2 2015 – Implement Comprehensive Shortage Pricing Changes**
- ◆ **Spring 2016 – Implement Comprehensive Scarcity Pricing Changes**

Comments and feedback are requested throughout this review process

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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