

# Market-to-Market Coordination with PJM

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# The Roles of the NYISO



## Reliable operation of the bulk electricity grid

- *Managing the flow of power nearly 11,000 circuit-miles of transmission lines from more than 300 generating units*



## Administration of open and competitive wholesale electricity markets

- *Bringing together buyers and sellers of energy and related products and services*



## Planning for New York's energy future

- *Assessing needs over a 10-year horizon and evaluating the feasibility of projects proposed to meet those needs*



## Advancing the technological infrastructure of the electric system

- *Developing and deploying information technology and tools to make the grid smarter*

# Agenda

- ◆ Background
- ◆ Benefits of Market-to-Market
- ◆ Market-to-Market Coordination Overview
- ◆ Examples
- ◆ Market-to-Market Flowgates
- ◆ Market Flows
- ◆ Settlement
- ◆ Tariff Impacts
- ◆ Next Steps

# Background

- ◆ On January 12, 2010, the NYISO filed a report with FERC describing the Broader Regional Markets suite of solutions, including Market-to-Market Coordination, to address loop flows
- ◆ On December 30, 2010, the FERC ordered the NYISO to complete Market-to-Market by Q2 2011
  - *NYISO's request for rehearing of the Q2 2011 implementation date is pending before FERC*
- ◆ On March 31, 2011, the NYISO discussed the status of Market-to-Market Coordination with PJM at the MIWG

# Purpose

- ◆ Market to Market (M2M) provides the ability for the NYISO to request a neighboring market to re-dispatch generation to solve a NYISO constraint at a lower cost, thereby reducing the overall cost of congestion

# Benefits of M2M

- ◆ M2M is an integral element of the BRM initiative
  - *Reduces congestion by expanding the pool of assets that are capable of addressing the region's transmission constraints*
  - *Provides better price convergence at the borders as a collective set of assets are used to resolve system limitations*
  - *Potomac Economics estimates the achievable NY benefits of M2M with PJM to be approximately \$10M annually*

# M2M Coordination Overview

- ◆ Requires manual coordination of NYISO and PJM Operations
  - *M2M activation notifications*
  - *Additional Transmission Outage notifications*
- ◆ Assisted by automated exchange of pertinent data to manage M2M re-dispatch:
  - *M2M Flowgate ID*  
*(Note: A flowgate is also known as a transmission constraint.)*
  - *M2M Flowgate Shadow Cost*
  - *M2M Flowgate Market Flow*
- ◆ Manually invoked when a M2M Flowgate is constrained

# Example 1 without M2M

- ◆ NY Central East interface is constrained
- ◆ NY dispatch moves 200MW of generation to solve the Central East constraint
  - *Western LBMPs move from \$80 to \$40*
  - *Eastern LBMPs move from \$80 to \$240*



# Example 1 with M2M

- ◆ NY Central East interface is constrained
- ◆ NY dispatch moves 200MW of generation to solve the Central East constraint
  - *Western LBMPs move from \$80 to \$40*
  - *Eastern LBMPs move from \$80 to \$120*
- ◆ NY requests M2M relief from PJM
  - *PJM provides 50MW of relief through re-dispatch*
  - *PJM LMPs move from \$60 to \$75*

# Example 1 with M2M (cont.)

- ◆ NY run another dispatch and moves 50MW less generation to solve the Central East constraint
  - *Western LBMPs move from \$40 to \$72*
  - *Eastern LBMPs move from \$120 to \$87*
- ◆ M2M for Central East continues where NY and PJM continue to re-dispatch for Central East until the constraint is no longer active

# Example 2 without M2M

- ◆ PJM East interface is constrained
- ◆ PJM dispatch moves 90MW of generation to solve the PJM East constraint
  - *PJM LBMPs are \$65 due to the PJM East constraint*
  - *NY LBMPs are \$45, no congestion in NY*

# Example 2 with M2M

- ◆ PJM East interface is constrained
- ◆ PJM dispatch moves 90MW of generation to solve the PJM East constraint
  - *PJM LBMPs are \$65 due to the PJM East constraint*
  - *NY LBMPs are \$45, no congestion in NY*
- ◆ PJM requests M2M relief from NY
  - *NY provides 30MW of relief through re-dispatch*
  - *NY LBMPs moves from \$45 to \$51*

## Example 2 with M2M (cont.)

- ◆ PJM run another dispatch and moves 30MW less generation to solve the PJM East constraint
  - *PJM LMPs move from \$60 to \$52*
- ◆ M2M for PJM East continues where PJM and NY continue to re-dispatch for PJM East until the constraint is no longer active

# M2M Flowgates

## ◆ NY Flowgates – Initial Set

- *Dysinger East Interface*
- *West Central Interface*
- *Central East Interface*
- *Leeds - Pleasant Valley Line for the loss of:*
  - Athens – Pleasant Valley Line
  - Leeds – Hurley Avenue Line
  - Athens – Pleasant Valley & Leeds – Hurley Avenue Lines
- *Additional Flowgates may be added in later phases*

# M2M Flowgates

## ◆ PJM Flowgates – Initial Set

- *PJM East Interface*
- *Erie West TX1 for the loss of Erie West-Erie South Line*
- *Erie West TX3 for the loss of Erie West-Erie South Line*
- *Keystone-Juniata & Conemaugh-Juniata Parallel Lines for the loss of:*
  - BlackOak-Bedington Line
  - Conemaugh-Keystone Line
  - Pruntytown-Mt. Storm Line
- *Additional Flowgates may be added in later phases*

# Market Flows

- ◆ Market Flows represent the amount of flow on a flowgate that is caused by generation dispatch to meet internal control area load
  - *The Market Flow Calculation is based on equations contained in the NERC [IDCWG Change Order 283](#) document*



# Market Flows

- ◆ Additionally, the NYISO and PJM Market Flow Calculation will account for the PAR control effects of:
  - *The Ramapo PARs*
  - *The ConEd – PSEG PARs*
  - *The Saint Lawrence PARs*

# Market Flows

- ◆ Finally, the Controllable Ties (DC or VFT controlled) will be modeled in the Market Flow Calculation as follows:
  - *Neptune and CSC imports will reduce LI load*
  - *Linden VFT imports will reduce NYC load, and exports will reduce NYC generation*
  - *HQ Chateauguay and HQ Cedars imports will reduce NYCA load, and exports will reduce NYCA generation*

# Settlement

- ◆ The NYISO is performing the settlement calculations for both NY and PJM
  - *The NYISO will produce invoices for PJM indicating the amount payable to/receivable from PJM*
- ◆ The settlement calculation will be based on interval level data
- ◆ Methodology for establishing entitlements is still in progress

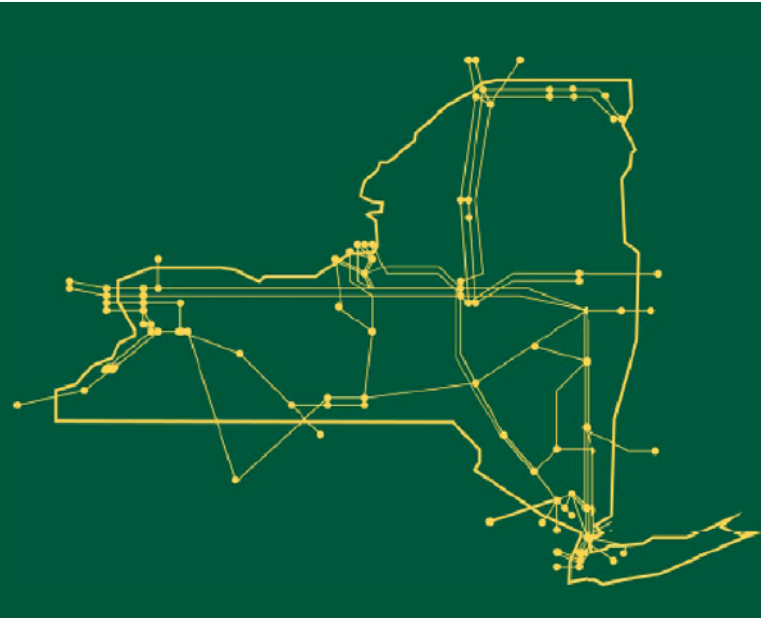
# Tariff Impacts

- ◆ PJM – NYISO JOA
  - *OATT Attachment CC*
  
- ◆ PJM – NYISO Interregional Congestion Management Pilot Program
  - *MST Section 5*

# Next Steps

- ◆ Continue discussions with PJM on M2M software integration and JOA development
- ◆ Joint M2M Stakeholder Meeting on July 21
- ◆ Share additional M2M details with Market Participants as they become available
- ◆ Develop tariff changes

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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