

# NYISO/PJM – Market Efficiency Focused Study

Northeast Coordinated System Plan  
IPSAC09  
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# Study Objective

- Complete a focused energy market simulation of the combined NYISO/PJM system.
- Identify areas with the highest Locational Marginal Price (LMP) spreads.
- Identify facilities that are causing congestion.
- Test the market efficiency impact of the potential solutions identified in the reliability analysis

# Market Simulation Input Data

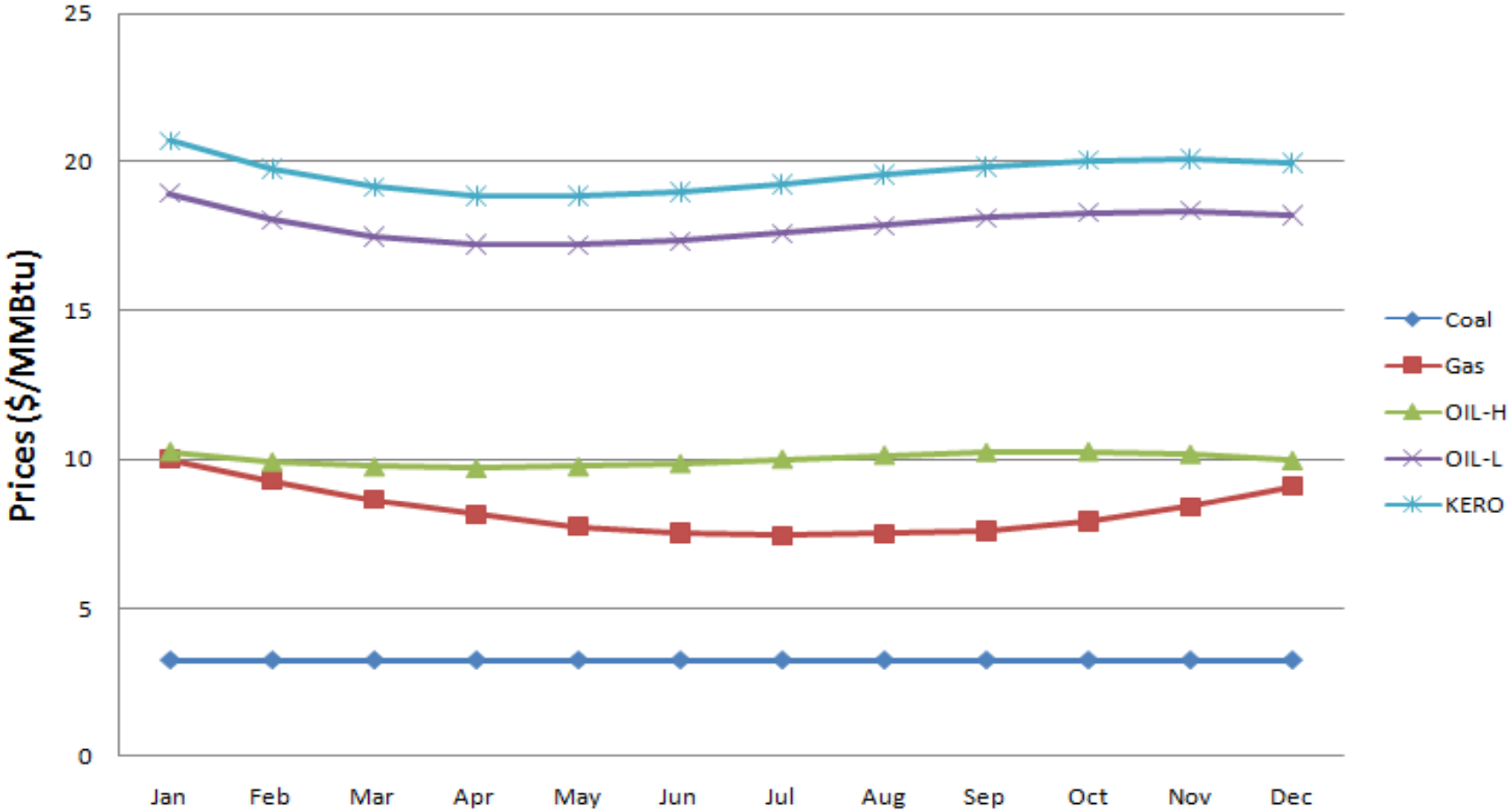
- Study year: 2013
- PROMOD IV model from Ventyx
- Underlying input data contained in PROMOD Powerbase database (February 2009 update) including generating units and unit characteristics, fuel costs and emissions costs

# Key Input Parameters

- Fuel prices
- Load and energy
- Unit capacity
- Emissions prices
- Transmission topology

# Fuel Price Forecasts

## 2013 Average RTO Fuel Price Assumptions



\*Data from EIA forecast for 2013

# Load & Energy Input Data

- 2013 PJM zonal peak and zonal energy forecast from PJM 2009 Load Forecast Report
- 2013 NYISO and ISO-NE load and energy forecast from PROMOD Powerbase database (February 2009 update)

Table 1 – Forecast PJM Peak and Energy

| Load         | PJM     | NYISO   | ISO-NE  |
|--------------|---------|---------|---------|
| Peak (MW)    | 146,467 | 35,661  | 30,409  |
| Energy (GWh) | 778,747 | 179,302 | 151,131 |

# Unit Capacity

- The PROMOD Powerbase database contains unit specific information gathered from various public sources, including EIA, FERC, and RTO websites.
- Total internal unit capacity available for 2013.

Table 2 – 2013 Summer Internal Capacity (MW)

|               | PJM     | NYISO  | ISO-NE |
|---------------|---------|--------|--------|
| Capacity (MW) | 167,137 | 38,203 | 31,460 |

## Emission Prices

- 2013 Emission Allowance Price Assumptions for SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> are assigned to generators based on generator location and release rates

Table 3 – Average RTO Effluent Prices (\$/Ton)

| Year | SO <sub>2</sub> | NO <sub>x</sub><br>Annual | NO <sub>x</sub> Seasonal<br>(May-Sep) | CO <sub>2</sub> |
|------|-----------------|---------------------------|---------------------------------------|-----------------|
| 2013 | 725             | 998                       | 751                                   | 10              |

# Transmission Topology and Constraints

- NYISO/PJM Market Efficiency Focused study – Topology Assumptions
  - Equivalent to the PJM/NYISO reliability focused study
    - PJM topology is a Summer 2013 base case – updated with RTEP upgrades approved as part of the 2008 RTEP plan.
    - NYISO topology is based on 2009 Reliability Needs Assessment (RNA) system model for year 2013
    - ISO-NE topology is based on 2008 Regional System Plan (RSP) system model for year 2013

# Merchant Transmission Projects

- Includes new ties between New York and PJM
  - Neptune project (PJM Queue G07\_MTX) modeled as 685 MW transfer from Sayreville to Newbridge Road.
  - VFT (PJM Queue G22\_MTX) modeled as 330 MW transfer from Linden 230 KV to Goethals.
  - Hudson Transmission Partners (PJM Queue O66) modeled as 670 MW transfer from Bergen to West 49<sup>th</sup> Street Substation.

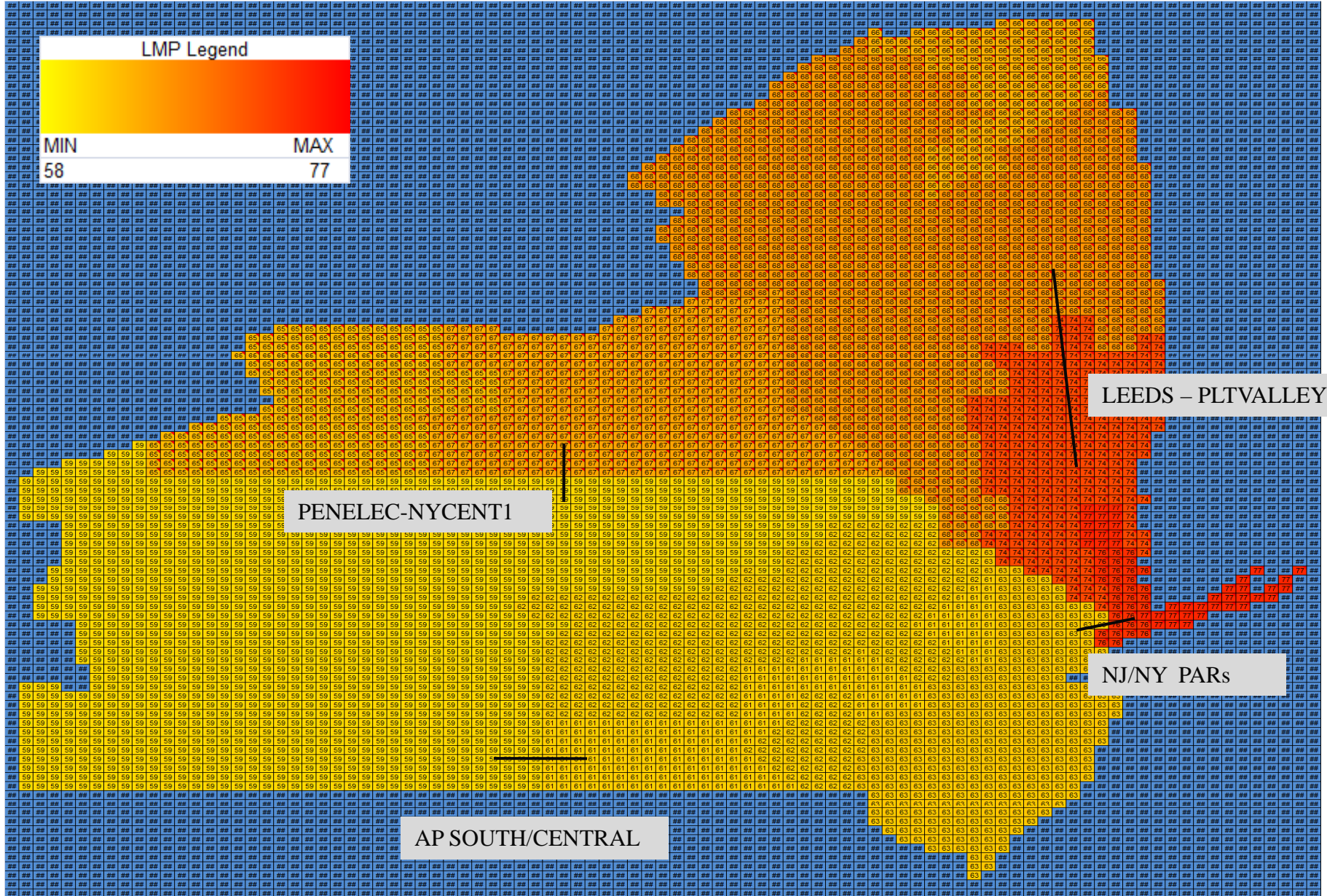
# NYISO/PJM Focused Study – Interchange Assumptions

- Interchange modeled using a \$10/\$5 commitment/dispatch hurdle rate.
- Public Service / ConEd Wheel modeled as 1000 MW total into Waldwick and 1000 MW total out to Hudson and Linden.
- Initial setting of the Ramapo PAR set to 900 MW into NYISO.

## NYISO/PJM Market Efficiency Focused Study – Initial Results

- Congestion LMP Contour Map
- Congestion By Constraint
- Summary

# NYISO/PJM Market Efficiency Focused Study – Initial Results – LMP Zonal Contour Map



# NYISO/PJM Market Efficiency Focused Study – Initial Results

## Congestion Ranking

| Constraint                          | AREA      | Frequency (Hours) | Market Congestion Rank |
|-------------------------------------|-----------|-------------------|------------------------|
| LEEDS- PLTVLLEY CTG                 | NYISO     | 3380              | 1                      |
| INTERFACE AP - SOUTH                | PJM       | 2121              | 2                      |
| INTERFACE PJM-CENTRAL               | PJM       | 5189              | 3                      |
| WALDWICK PARs                       | PJM-NYISO | 8719              | 4                      |
| RAMAPO PARs                         | PJM-NYISO | 7444              | 5                      |
| FARRAGUT PARs                       | PJM-NYISO | 8736              | 6                      |
| ALTOONA - BRRCK N3                  | PJM       | 1171              | 7                      |
| CLOVERDALE - LEXINGTON              | PJM       | 544               | 8                      |
| CLOVER 500/230 KV TX CTG            | PJM       | 1017              | 9                      |
| GOTHLS S - GOWANUSS CTG             | NYISO     | 532               | 10                     |
| INTERFACE Line: 966 PENELEC-NYCENT1 | PJM-NYISO | 5042              | 11                     |
| ELRAMA - MITCHEL CTG                | PJM       | 1879              | 12                     |
| LINDEN-GOETHALS PAR                 | PJM-NYISO | 8721              | 13                     |
| INTERFACE Line: 669 CE GROUP        | NYISO     | 464               | 14                     |
| LINWOOD - CHICHESTER2               | PJM       | 282               | 15                     |

# NYISO/PJM Market Efficiency Focused Study – Initial Results

## Summary

- Total System Congestion is about \$1.2 billion across all RTOs
- Largest LMP spreads in following Areas
  - Western PJM to Eastern PJM
  - Northern/Western NY to South Eastern/Long Island NY
  - NJ/NY PAR facilities
- Congestion facilities within each area is consistent with annual market efficiency analysis
- Currently no reliability based solutions recommended
  - Market Efficiency impact test not required

## NYISO/PJM Market Efficiency Focused Study – Next Steps

- Initial focused Market Efficiency analysis has looked at all study objectives

### Next Steps

- New focused study on NJ/NY PAR Area
  - Modeling assumptions and techniques
- Continued development of joint database
- Incorporate stakeholder feedback