

# MISO-PJM Interchange

## July 6<sup>th</sup>, 2012

September 20<sup>th</sup>, 2012  
JCM Meeting



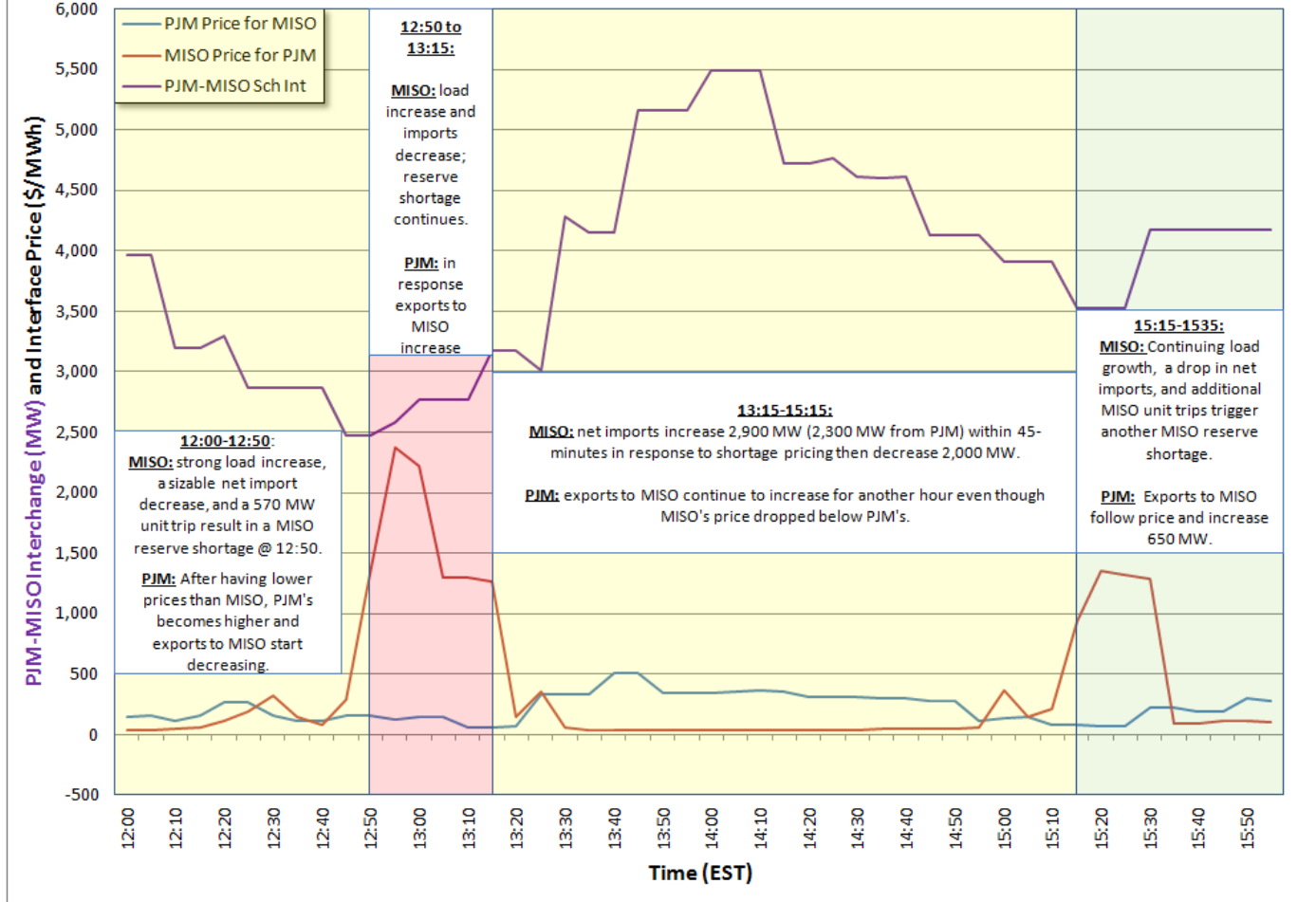




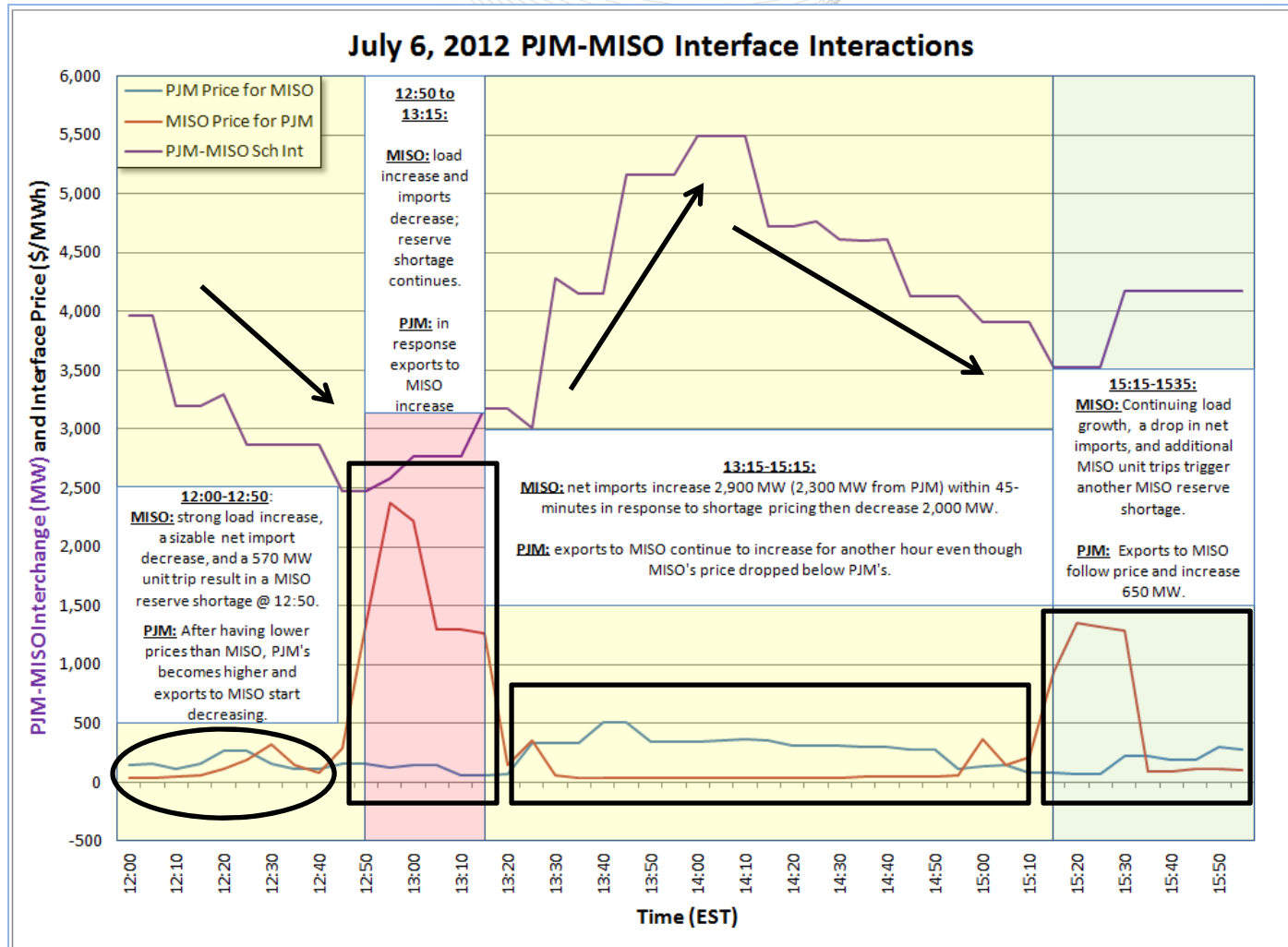
- MISO and PJM Organized a team
- Data Analysis
  - Net Scheduled Interchange
  - Price Formation
  - Reserves
  - Regulation
- Dispatch Tools
- Prioritization of JCM initiatives

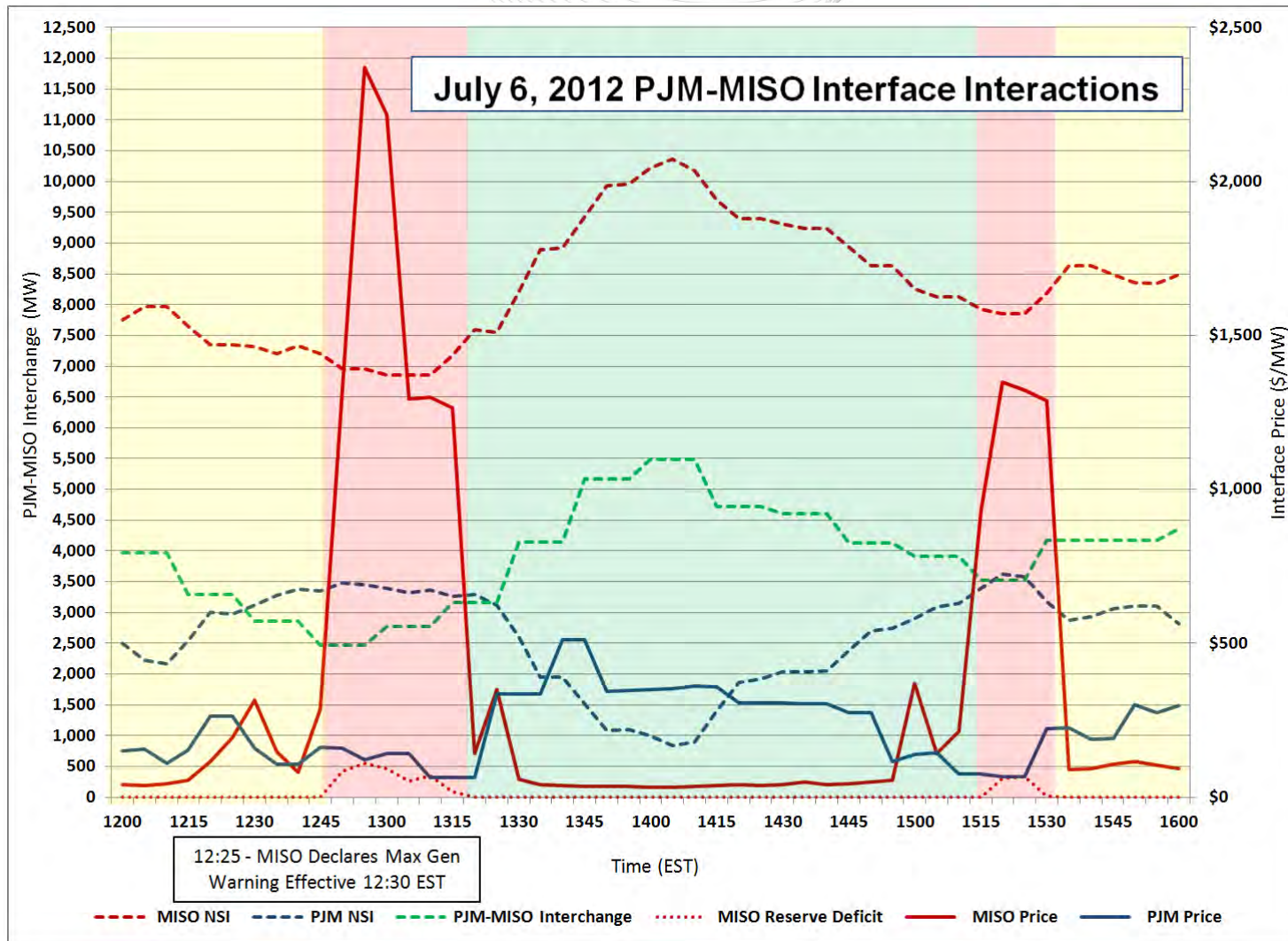
- Price Volatility
- Markets Design
- Ongoing Market Initiatives
- Net Scheduled Interchange
- JCM Analysis
- Market Analysis July 2013

### July 6, 2012 PJM-MISO Interface Interactions

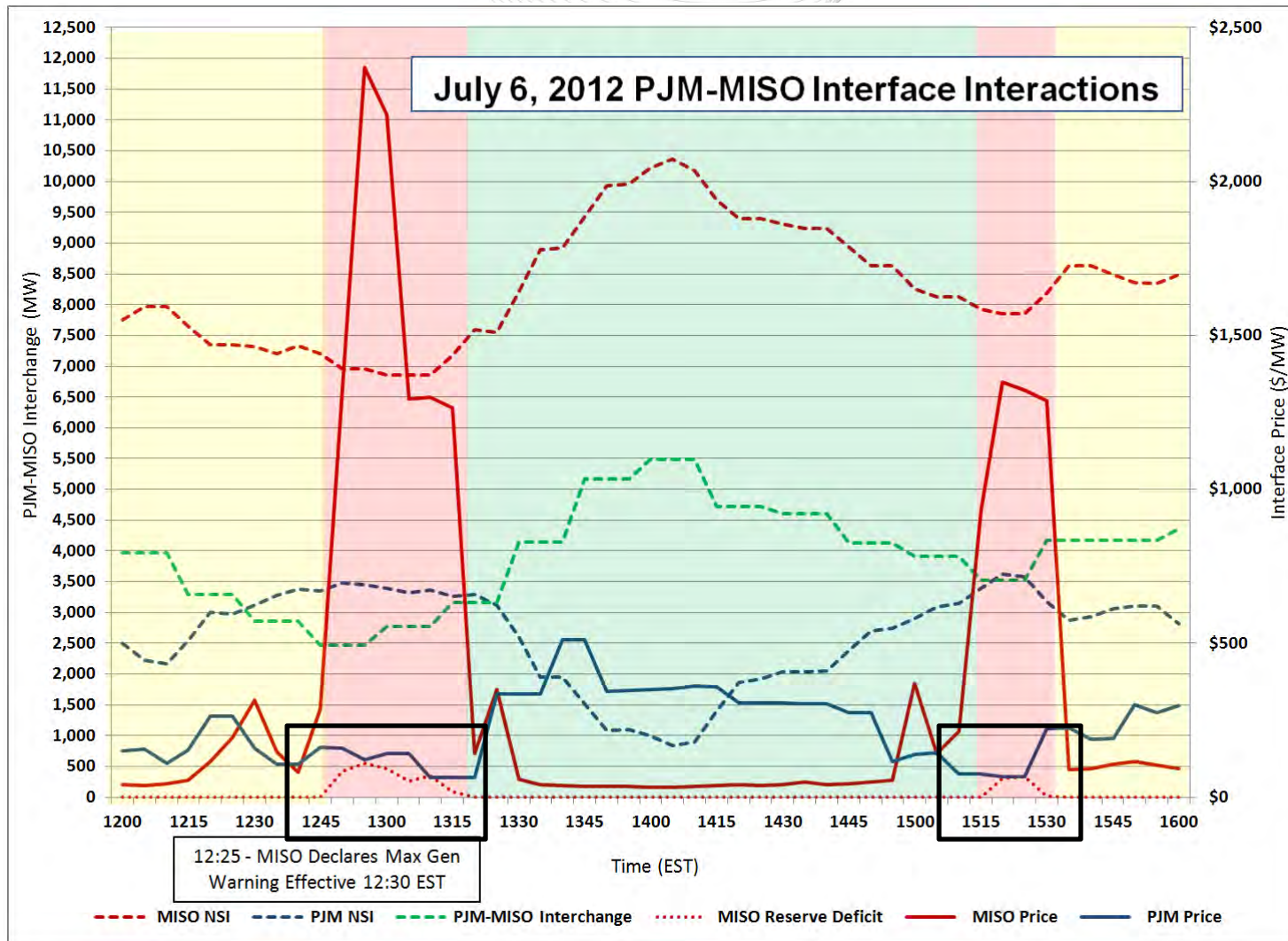














## Market Comparison

- CT Pricing
- Import/Export
- Look Ahead Commitments
- Co-optimization
- Reserves/Regulation

## Next Steps

- Review hot weather days in July 2013
- Interchange Optimization
- Scheduling Rules
- Regulation/Reserves
- Operating Procedures
- Market Rules
- Interregional Coordination



## JCM Work Plan

- JCM Priority
- Interchange Optimization





# Questions

PJM

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## CT Pricing/Import Scheduling

Area	PJM	MISO
<b>CT Pricing</b>	Two systems, IT SCED and RT SCED. IT SCED determines CT commitment and provides guide to RT SCED. RT SCED does on-line unit dispatch and pricing calculation. CT's can only set price if they are called on by dispatch.	Two systems, LAC (look ahead commitment) and RT UDS. LAC commits CT's. RT UDS does online dispatch and price setting for both energy and AS products (regulation, spinning and sup). CT's can only set price if on-line.
<b>Import/Export Lag/Ramp</b>	PJM has 1000 MW ramp limit over 15 minutes for both Imports and Exports. Schedule submission timelines – 20 minutes prior to start of schedule.	MISO has a 1000 MW ramp for Imports and a 500 MW ramp for Exports over 15 minutes. Schedule submission timelines – 30 minutes prior to start of the schedule.

## Look Ahead Commitments

<b>Look Ahead Commitments</b>	IT SCED co-optimized energy and synchronize reserve and commits units based on 4 look ahead intervals. These intervals are at 15, 30, 75, 120 minutes.	MISO uses the LAC which operates similar to IT SCED in that it performs CT commitment. It looks out 3 hours with 15 minutes intervals for the first two hours and 30 minute intervals for the third hour.
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Appendix 3

## Co-optimize/Shortage Pricing

<b>Co-optimized Energy/AS markets and Shortage Pricing</b>	PJM's current Scarcity Pricing system that was in effect during this event was based on if a scarcity event occurred it triggered a series of Emergency Procedures and Events but pricing was still determined by the highest Generator Cost Offer during the event. The new process does include penalty curves and enforces synchronize reserve requirement similar to MISO. PJM's regulation commitment and dispatch is calculated through ASO which will be honored in RT-SCED process	MISO co-optimizes the energy and AS products in the economic dispatch engine. Its Shortage Pricing solution uses demand curves to price AS products when Reserves are not sufficient to meet the Reserve Requirement. For example, the minimum Operating Reserve Demand Curve price is \$200 per MWh. The maximum Operating Reserve demand curve price can be up to \$3,500 per MWh. The Operating Reserve Demand Curve increases when the magnitude of the shortage increases.
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## Reserves

<p><b>Reserve Requirements</b></p>	<p><b>RFC Zone:</b>          Primary: ~2000MW          Synchronized: = ~1350 MW  <b>Mid-Atlantic/Dominion</b>          Primary Reserve = 1700 MW          Synchronized Reserve = ~ 1350 MW  <b>RTO Regulation:</b> 1% peak load in regulation: ~1400MW          With implementation of scarcity pricing on October 1, 2012, PJM reduced their regulation requirement to 0.7% of peak load.</p>	<p>Zonal requirement for six reserve zones in addition to MISO system wide requirement. Typical system wide reserve requirement is:          Regulating reserve : 300MW to 500MW          Synchronized (Spinning) Reserve: 900MW          Overall Contingency Reserve (including Spinning plus Supplemental reserve): 2010MW          The reserve requirement may be adjusted to reflect system conditions</p>
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