

MISO-PJM Joint and Common Market



Update of Interface Pricing at MISO



Background

- MISO is evaluating the efficiency and enhancement opportunity of the interface definitions that are intended to
 - Model interchange transactions in generation commitment and dispatch calculations
 - Determine price that reflects incremental production cost or savings and incents participants to schedule efficient transactions
- Investigating MISO's current method and few alternative approaches
 - Includes evaluation of PJM's current method which, if deemed efficient, may help meet stakeholders' requested alignment
 - Intended to identify a methodology that provides efficiency and meaningful price signals in a good majority of scenarios



Current Interface Definition

- The interface is represented as an aggregate pricing node
 - Comprised of a set of selected network nodes (EPNODEs)
 - LMP on the interface is the weighted average of LMPs at the EPNODEs
- MISO's external interface definition
 - Includes all EPNODEs at the generator locations in the external balancing area as represented in MISO network model
 - Equally weighted for flow distribution in dispatch calculation and for aggregated price calculation

Alternative Interface Definition

- Investigated expected performance of a revised definition that is derived based on M2M flowgate congestion analysis
 - Similar to PJM's approach for definition of MISO interface
 - Identified top 40 congested flowgates in 2012 based on number of binding hours
 - Includes both MISO and PJM managed flowgates
 - Determined nature of impact (help or hurt) of MISO-PJM transfer relative to direction of congestion
 - Selected a unique set of impactful external generator nodes
 - Currently consists of 7 Generator nodes in PJM
 - Equal weighting



Alternative Interface Definition (cont'd)

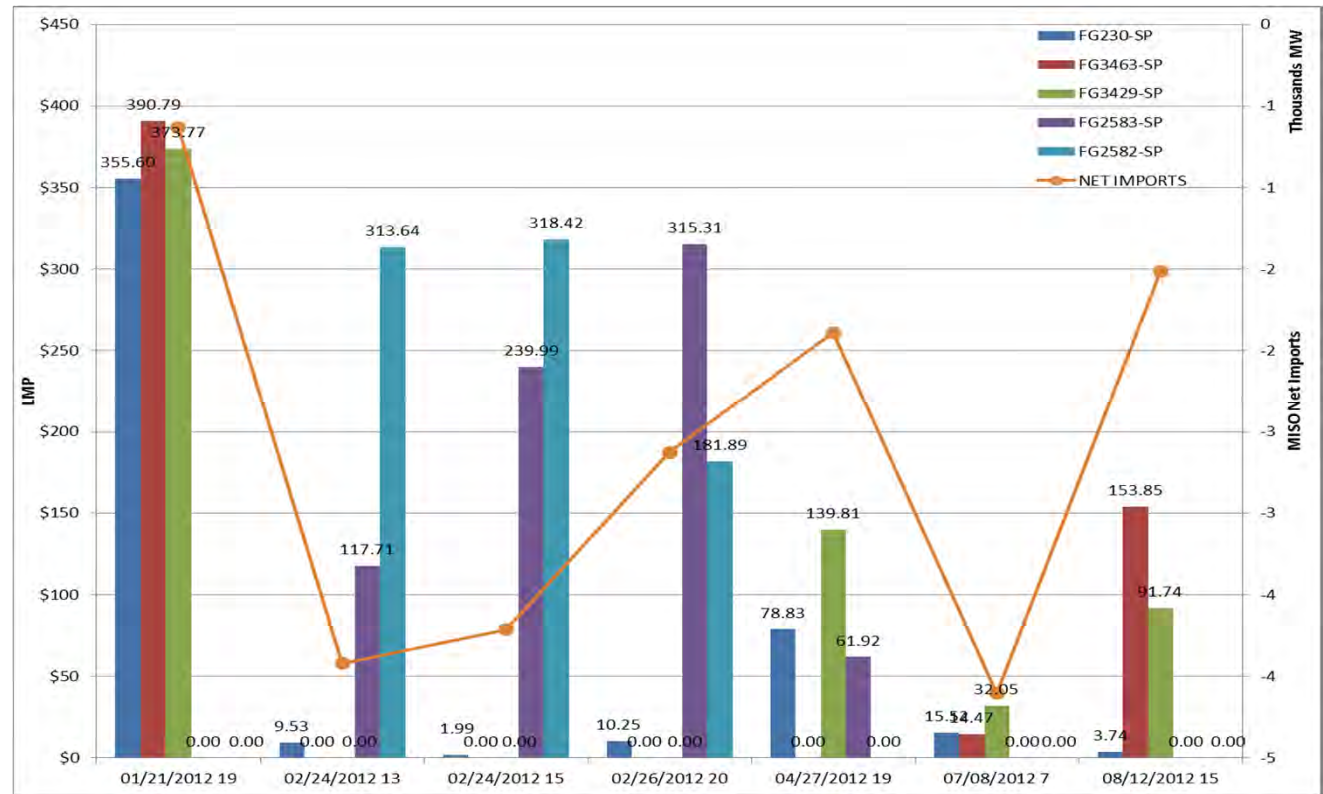
- Currently, the MISO PJM interface definition includes the following pricing nodes, all equally weighted:
 - U AEP 21WWVSTA 21W2
 - U AEP BUCHANA4 BU9
 - U AEP ELKHYDRO ELK
 - U AEP MOTTVILL MO4
 - U AEP SANDERSO SAN3
 - U DEOK BECKJORD UN3
 - U DEOK MIAMIFOR MI6



Interchange versus Congestion for Common Binding Hours

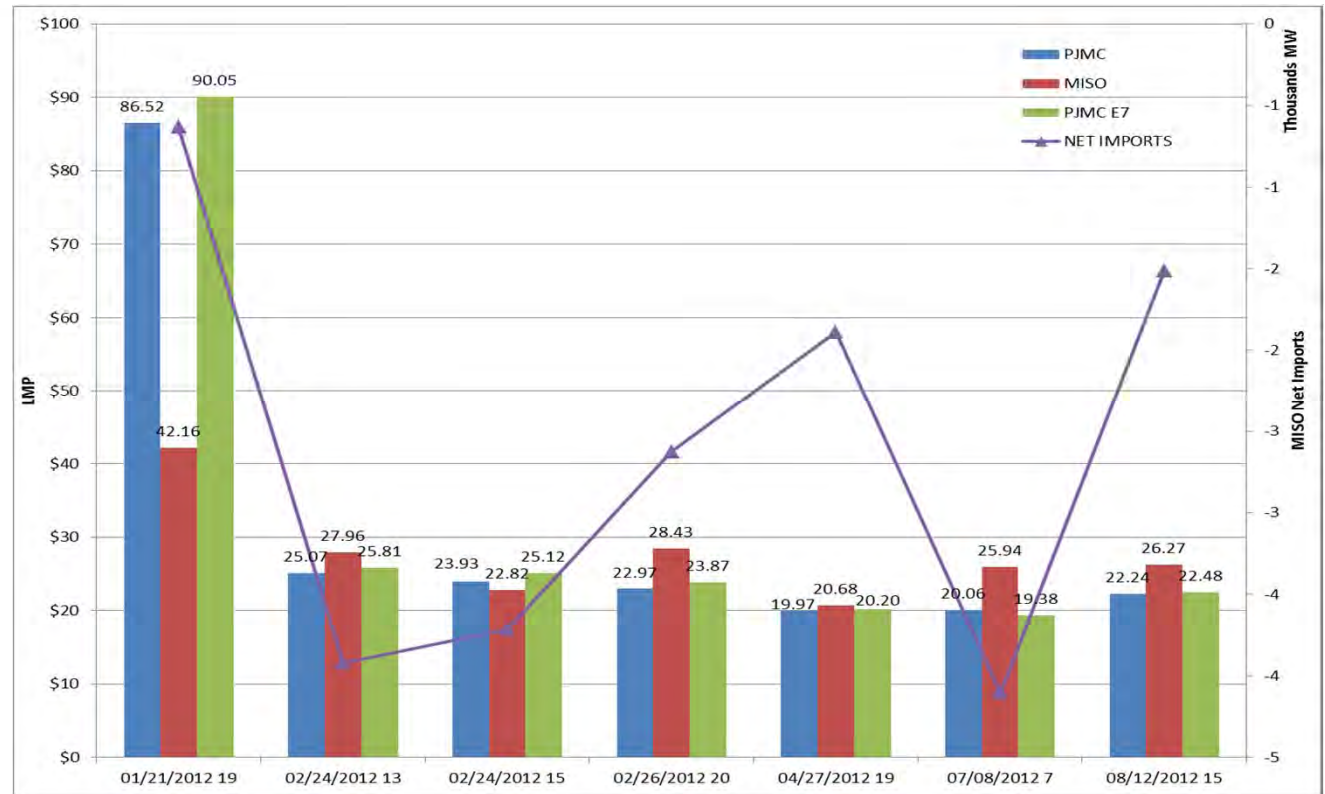
Impacts on top congested flowgates -

- Are often caused by internal market flows and parallel flows
- Do not always correlate directly with the net interchange



Interface Price versus Interchange for Selected Hours

- Evaluation of interface price efficiency need to consider relative impacts on flowgates where the congestion is not necessarily in the same direction (e.g. West to East)

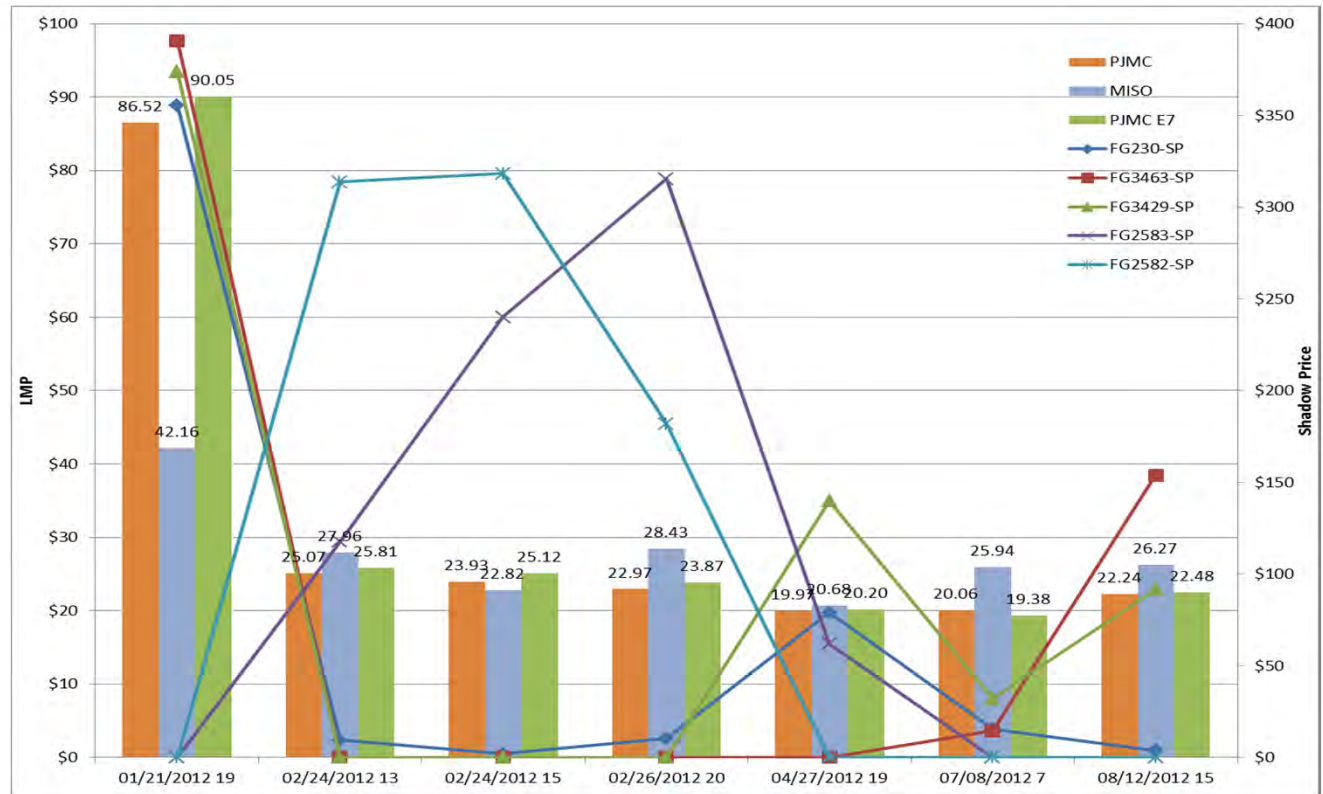


PJMC: Interface price for PJM as currently calculated by MISO
MISO: Interface price for MISO as currently calculated by PJM



Congestion versus Interface Price for Few Selected Hours

- Observed relatively small changes between two methods
- Further evaluation is needed to determine if the change is in the right direction



PJMC: Interface price for PJM as currently calculated by MISO

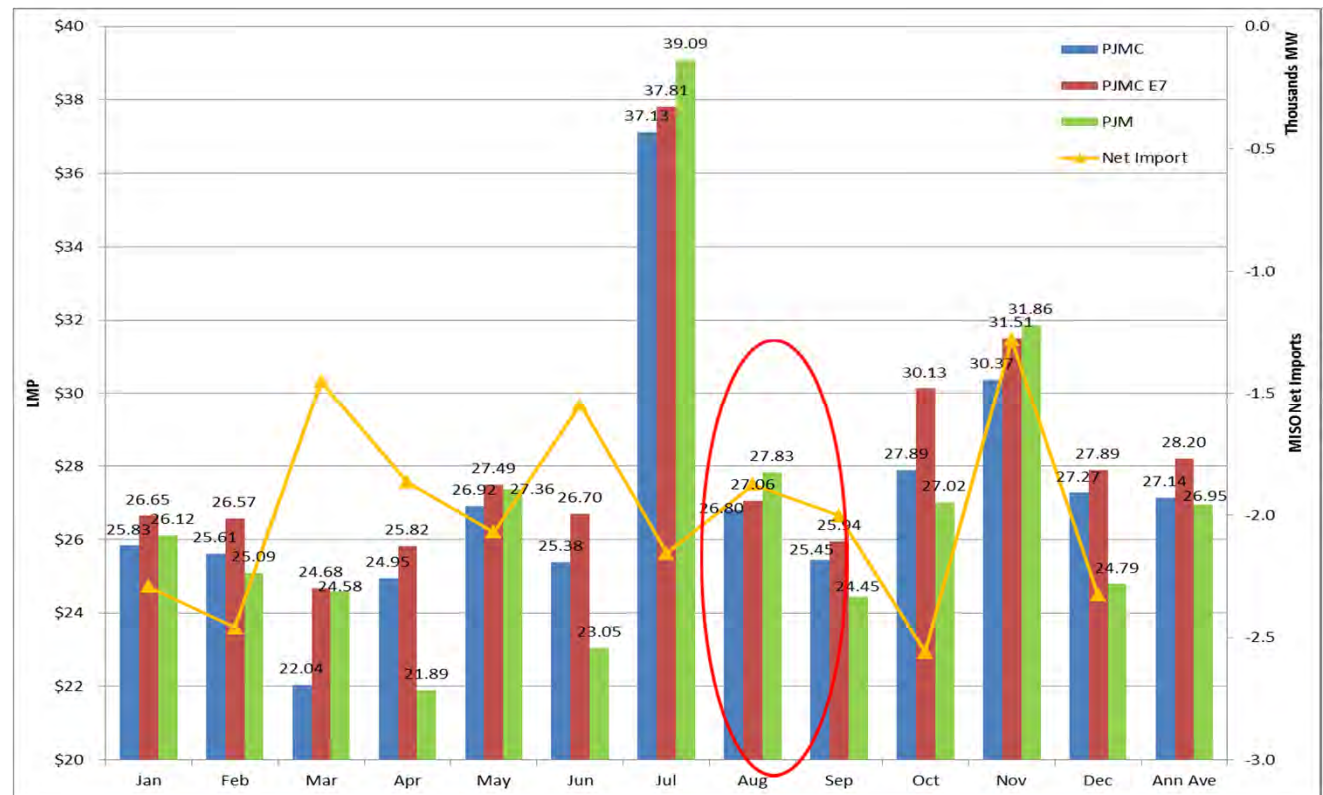
PJMC E7: Interface price for PJM that would be calculated by MISO under new method

MISO: Interface price for MISO as current calculated by PJM



Price Comparison and Interchange

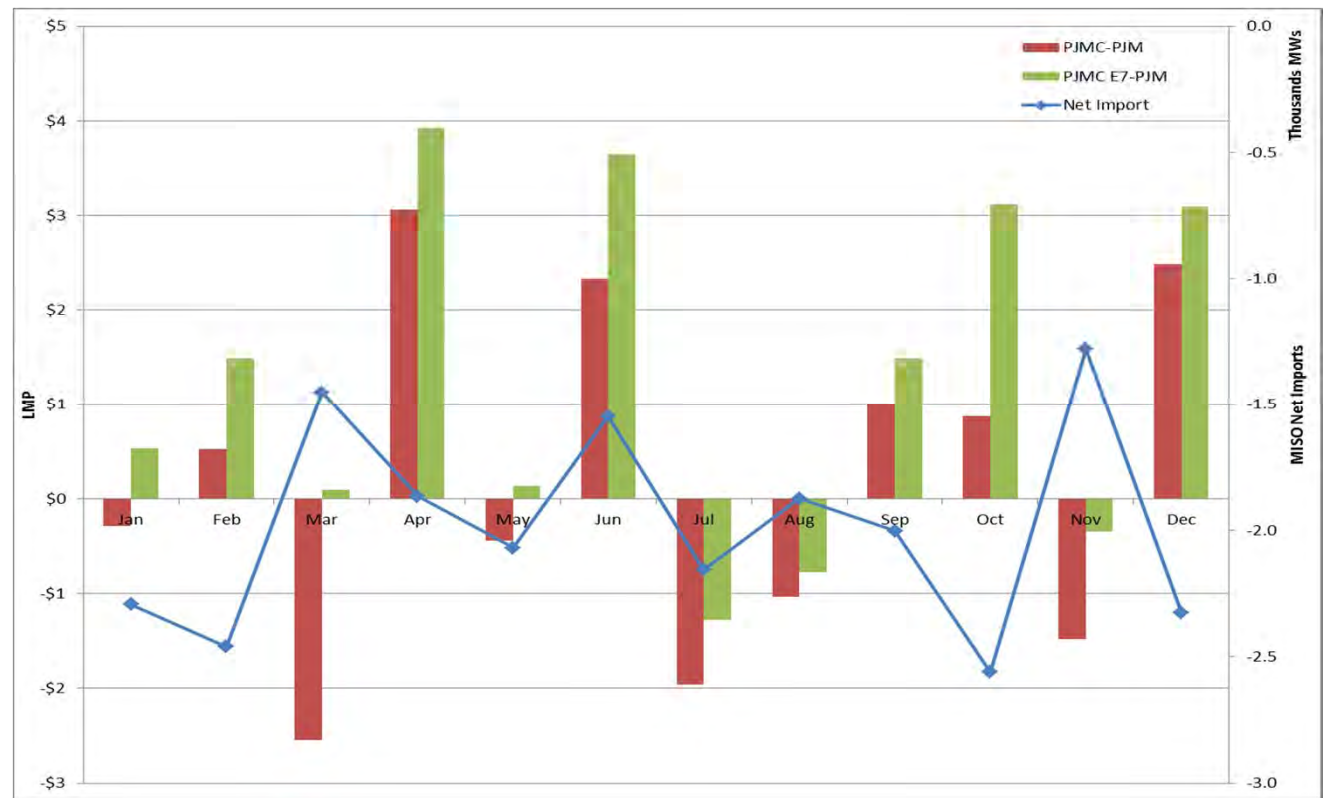
- Need to further evaluate consistency of net interchange against price separation



Price Differential and Interchange

On average basis -

- Except for certain peak months, the interface price separation is generally consistent with the interchange on average basis
- Transactions occur in the right direction in off-peak months



Findings with New Methodology

- The monthly average interface price increases compared to that with the present MISO interface pricing
 - The annual average interface price increases by \$1 with the new interface pricing
- The share of hourly transactions with PJM in the profitable direction is 49% (new method), slightly improved from 46% (current method)



Next Steps

- Continue evaluation and verification
- Investigate additional alternatives
- Discuss findings and alignment opportunities with PJM
- Develop recommendation
 - ✓ Expected by Q3 of 2013

Contact

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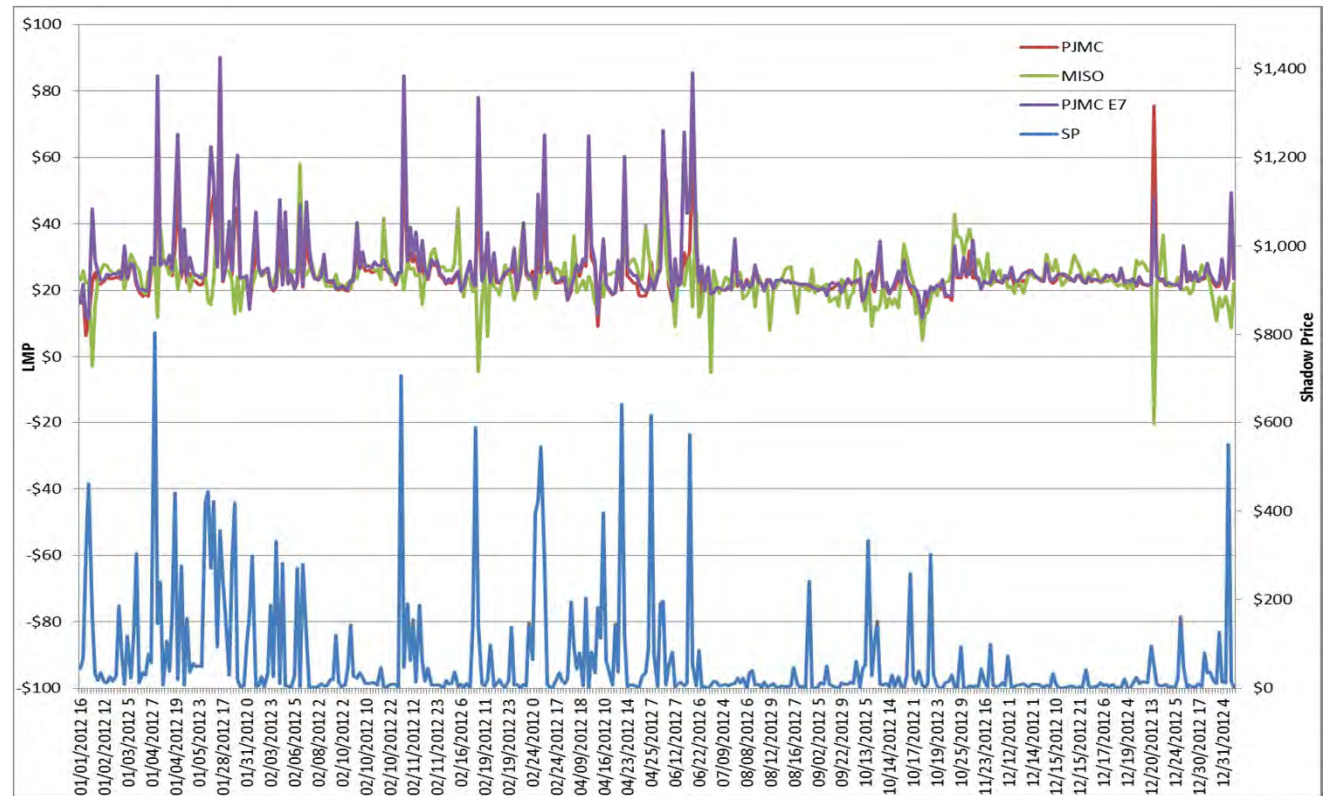
Appendix

Next few slides show the current and new interface prices against congestion level on selected flowgates and also the level of interchange during the same hours

- Same set of 5 selected flowgates as discussed earlier in this presentation

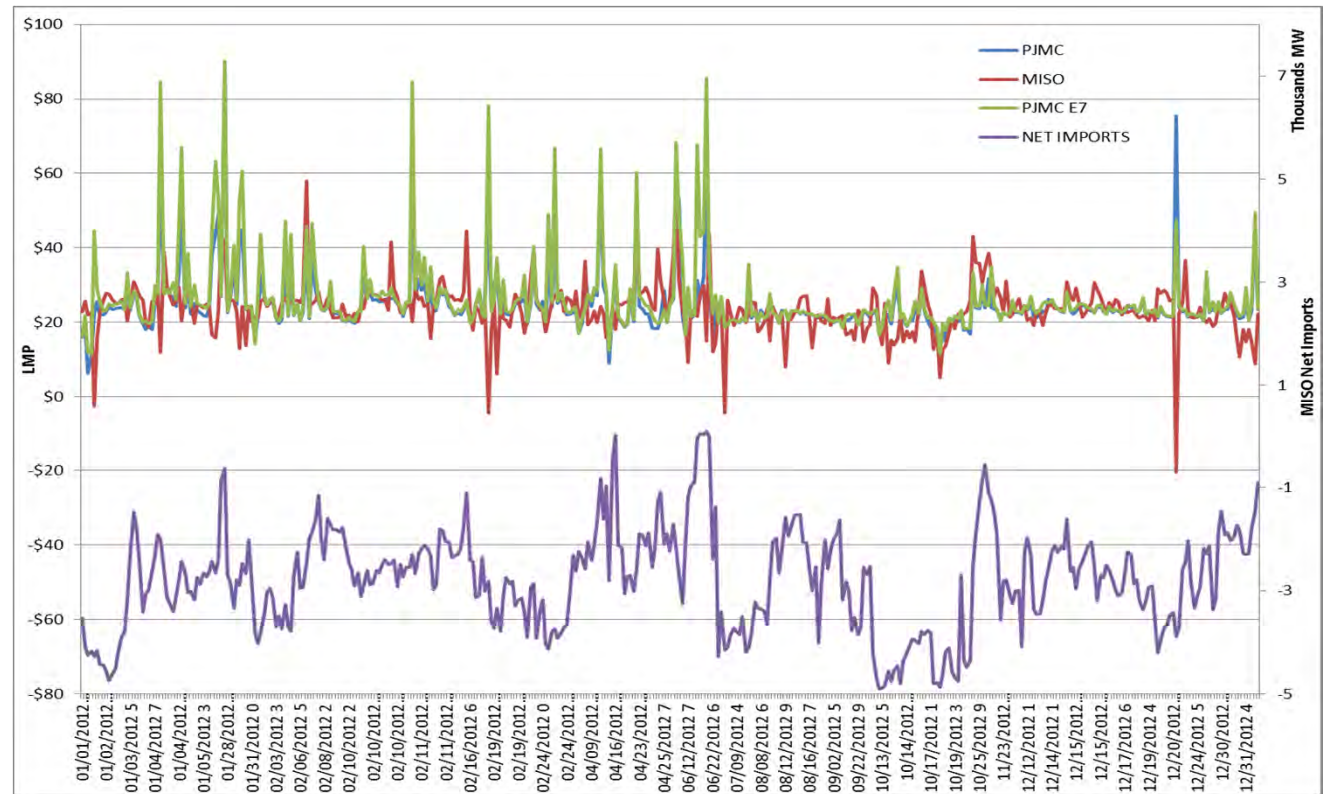
Breed_Wheatland345Jefferson_Rockport765

Interface Price
against Shadow
Price during
selected hours
when the
flowgate was
binding



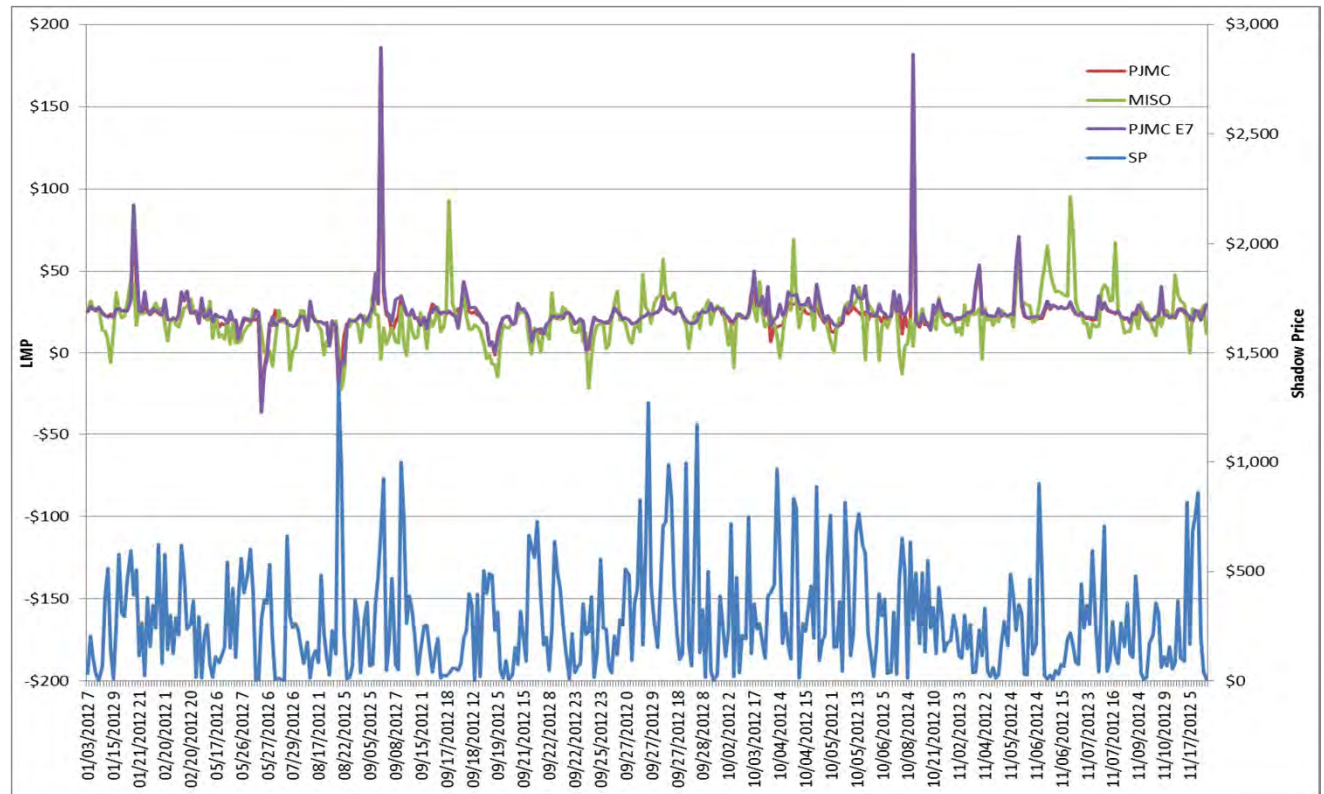
Breed_Wheatland345Jefferson_Rockport765

Interface Price
against Net
MISO Import
during selected
hours when the
flowgate was
binding



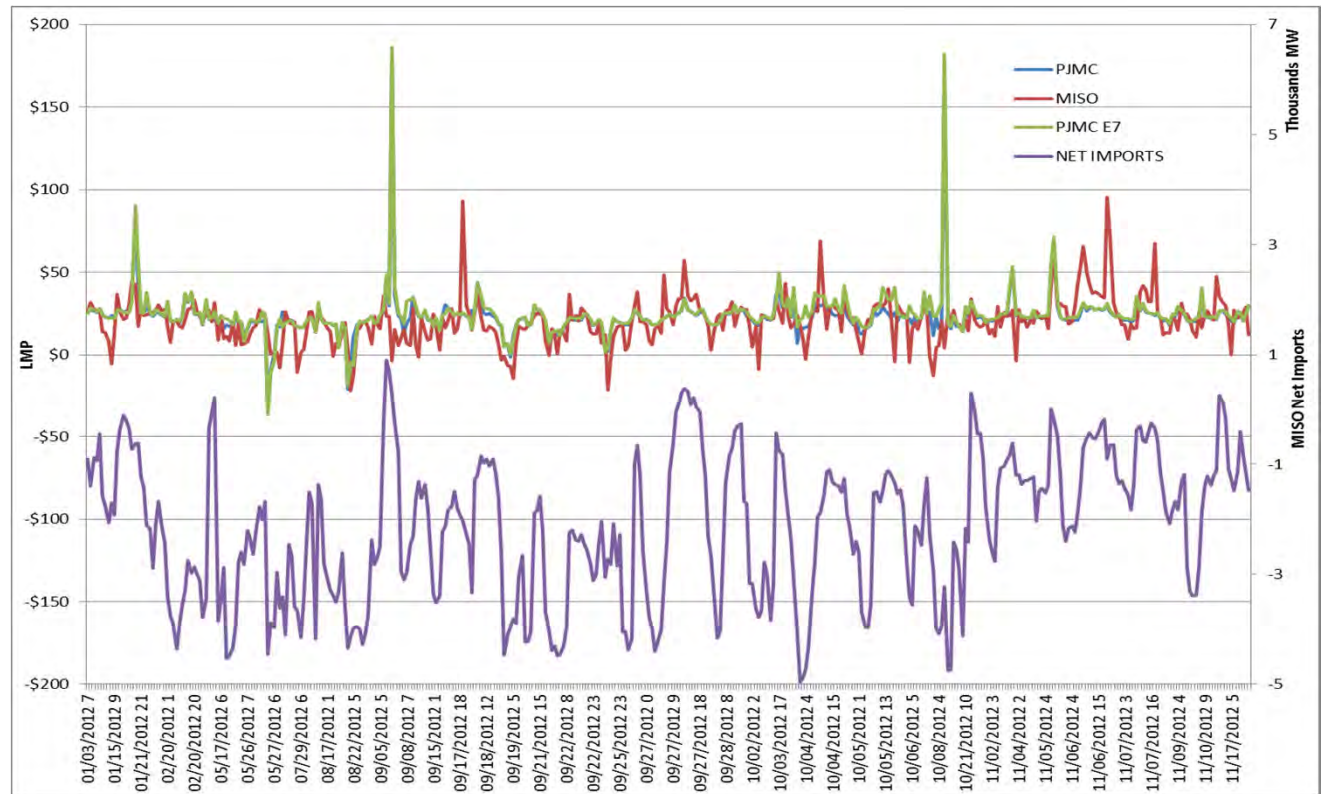
Rantoul_RantlJct_138_flo_NChmpgn_Mahmet_Rsng_138

Interface Price
against Shadow
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flowgate was
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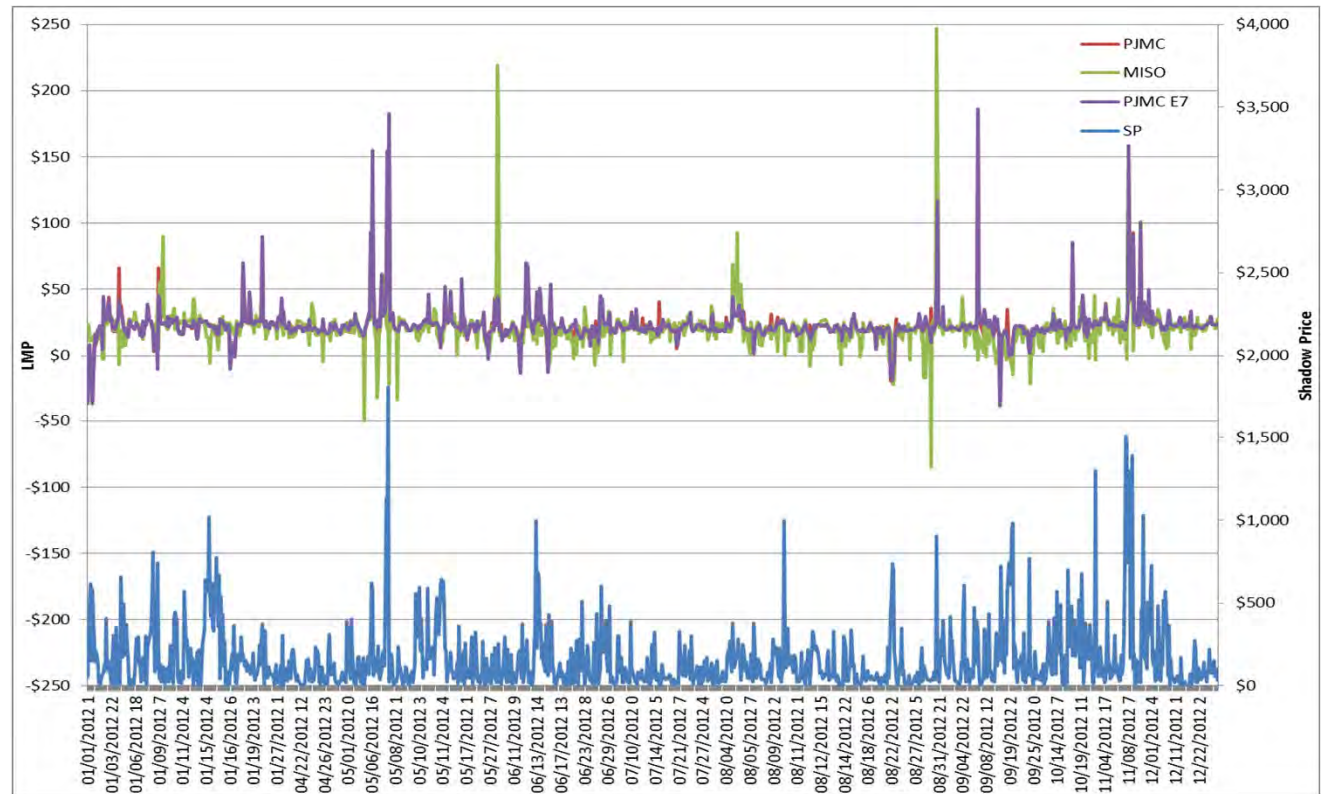
Rantoul_RantlJct_138_flo_NChmpgn_Mahmet_Rsng_138

Interface Price
against Net
MISO Import
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Oak Grove_Galesburg_flo_Nelson_ElectricJct

Interface Price
against Shadow
Price during
selected hours
when the
flowgate was
binding



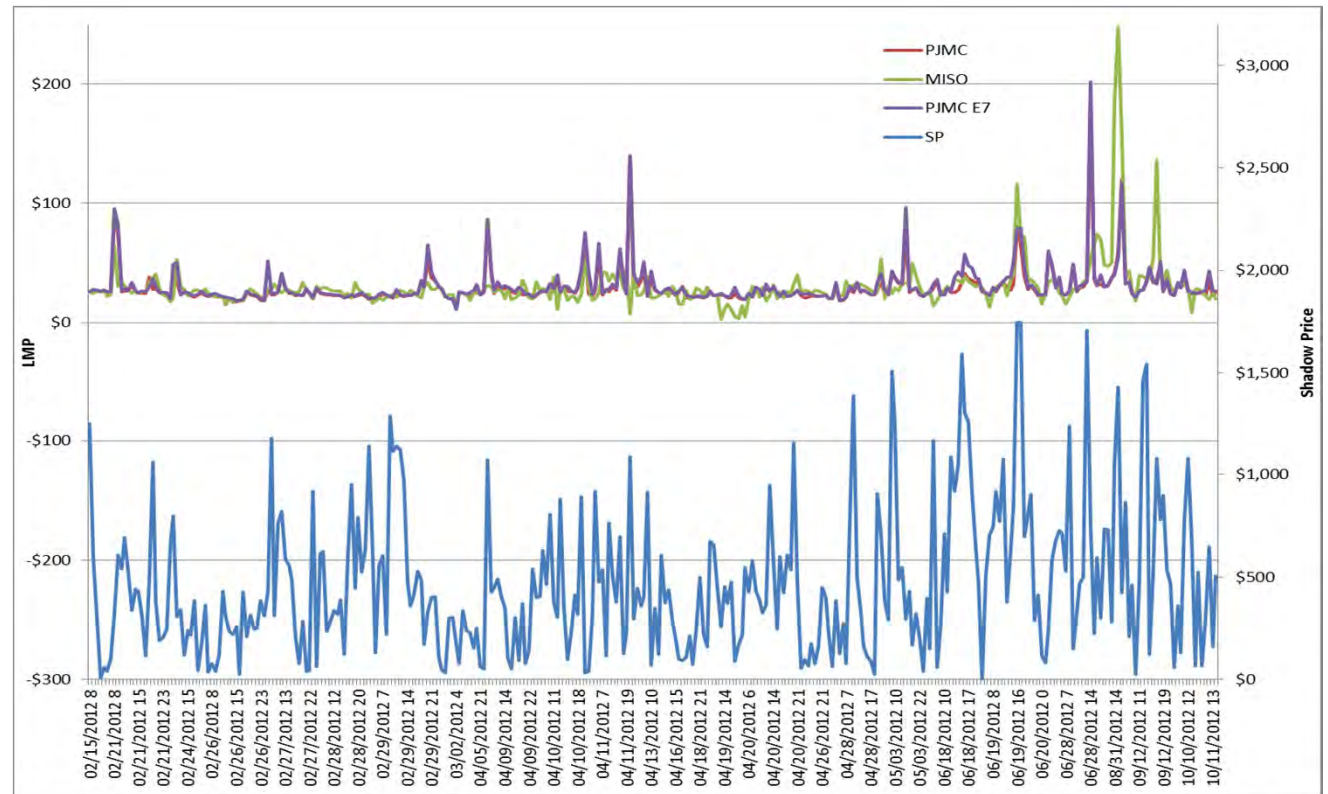
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Interface Price
against Net
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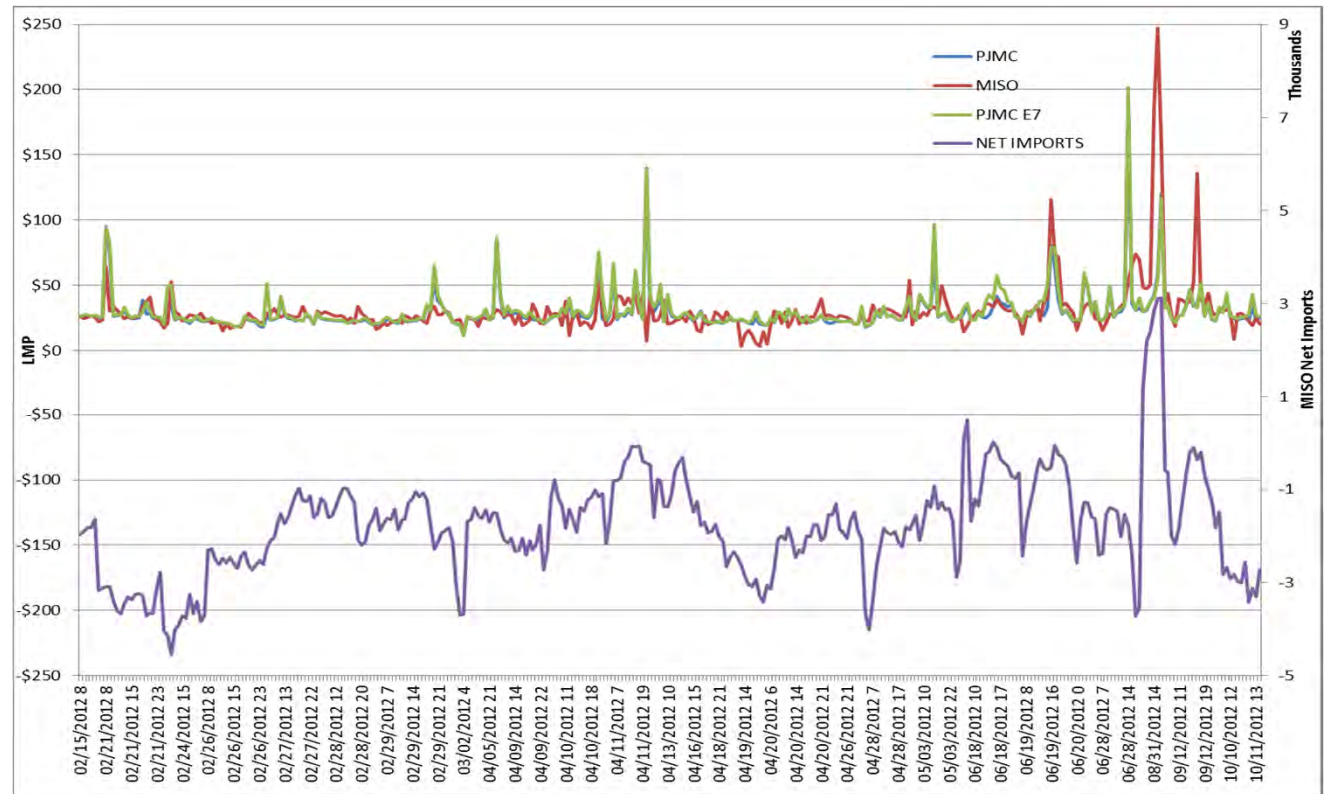
Monticello_East_Winamac_138_flo_Rockport_Jefferson_765

Interface Price
against Shadow
Price during
selected hours
when the
flowgate was
binding



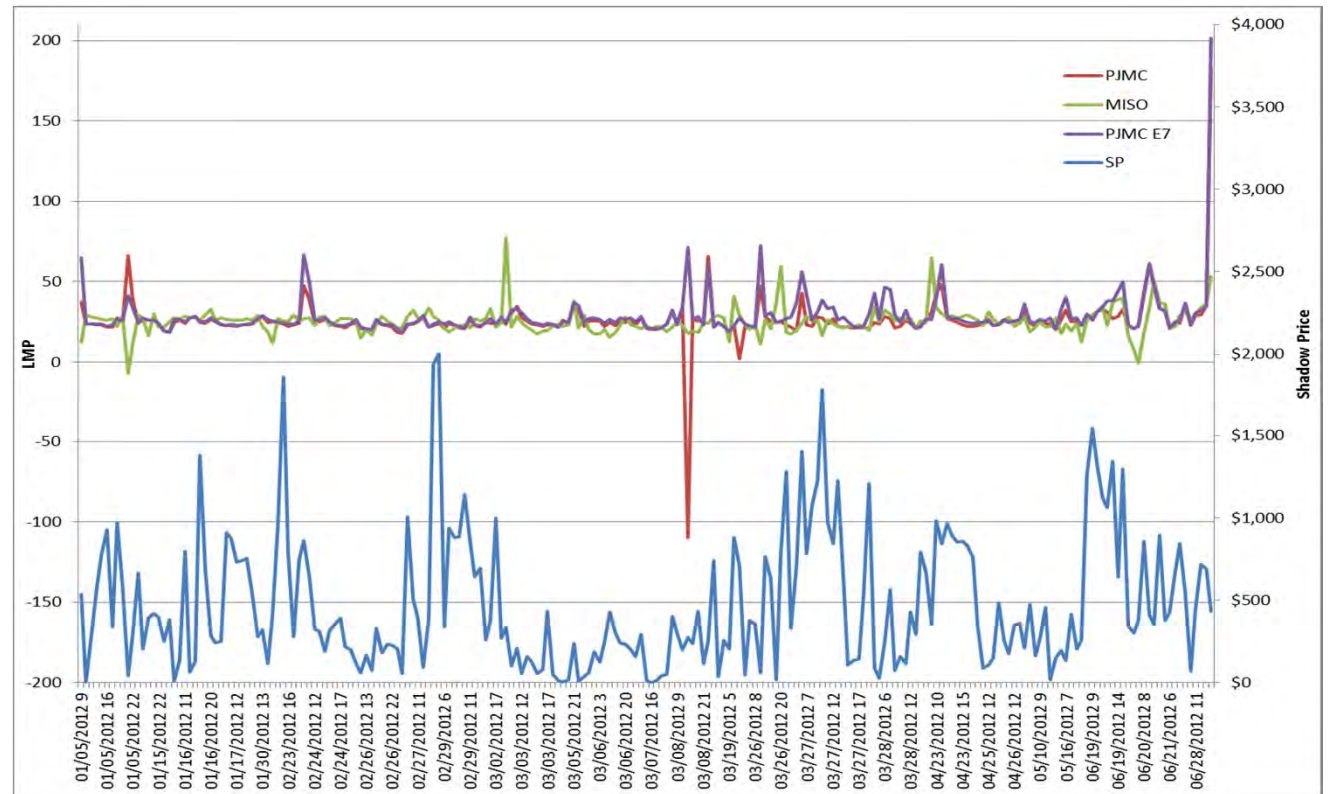
Monticello_East_Winamac_138_flo_Rockport_Jefferson_765

Interface Price
against Net
MISO Import
during selected
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Monticello_East_Winamac_138_flo_Schahfer_Burr_Oak_345

Interface Price
against Shadow
Price during
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Monticello_East_Winamac_138_flo_Schahfer_Burr_Oak_345

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