

Inter-Regional Interchange Scheduling: Analysis and Recommendations

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March 28, 2011

Statement of Problem

- **Counter-Intuitive Flow**
 - Roughly 50% of the time in 2009, the electricity flow was in the wrong direction (from higher price region to lower price region)
- **Interface is Likely Under Utilized**
 - The Interface may not be used to its fullest capacity.
 - It is inefficient if the LMPs are different on the two sides of the border
 - When flows are correct, interface is seldom used to the fullest

Improved Trading Would Lower Costs

- Ample capacity at the interface
- The least cost exporting region switches back and forth on regular basis
- Costs go down *more* in imported area than they rise in the exporting area
- Estimated* cost saving for loads: about \$200m for NY and \$225m for NE (2008-2010)

Average Change in Hourly (Real-Time) LMP, 2010*, \$/MWh		
	When Importing	When Exporting
NE	-7.43	+3.39
NY	-7.07	+4.83

*Source: Potomac Economics

Causes of the Current Problem

1. Delay

- The delay between transaction submittal, tie scheduling, and the flow of power
- System Conditions and prices can change in the interim

2. Transaction Scheduling does not use all available information:

- Transactions submitted by participants based on their expectations of prices in each market.
- Each ISO schedules its side of the transaction without knowledge of prices in the other ISO.

3. Transaction Costs

Two Proposed Solutions

1. Tie-Optimization:

- Joint dispatch of interface by both ISOs
- Make interface LMPs as close to each other as possible
- Manage interface the same as internal interfaces

2. Coordinated Transaction Scheduling (CTS):

- Participants bid on spread, quantities and direction at the interface.

– Both solutions

- Implement higher frequency scheduling
- Settle on real-time LMPs

How the Proposals Solve the Problem

- Exchange of information between ISOs
 - Clearing would be based on mutual expectation of price difference
 - Flow should be from the region with lower expected LMP region to the higher LMP region
 - Essential to address counter-intuitive flow
- Higher frequency scheduling
 - Allows for better timing
 - Makes LMP predictions more accurate
 - Forecasts closer to real-time
 - Shorter forecast duration

Tie-Optimization Synopsis

- ISOs will use all available, relevant information within their systems to optimize flow across the interface
- ISOs will exchange information about the cost to supply or the reduction in costs of purchasing at the interface
- Flows across the interface will be based on bringing the LMPs as close together as possible

CTS Synopsis

- **Participants submit bids consisting of three parts:**
 - Desired price spread
 - Quantity that the participants would like to trade
 - The direction that the participants would like to trade
- **Scheduling**
 - Will be done using the same information as in Tie Optimization, but limited by the spread
- **Settlement**
 - Accepted transactions receive /pay the difference between the two ISO's prices.

Comparison of the Solutions

- **Tie-Optimization**

- *Ex-ante* efficient solution, uses all available information
- Scheduling would not include any risk premium
- Does not require large number of competitors to reach efficient solution

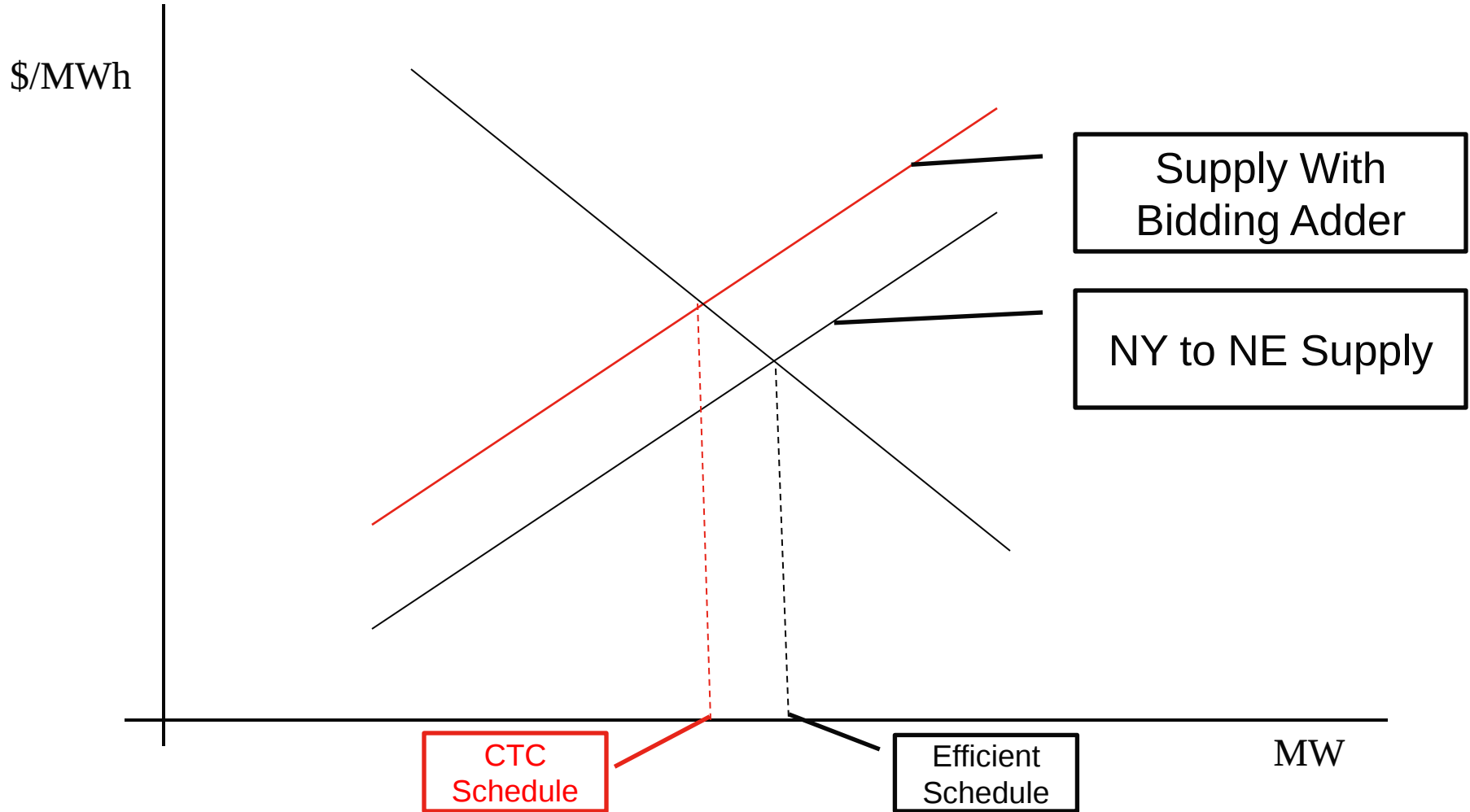
- **CTS**

- Participants do not have access to information available to ISOs: e.g. generator offers, current output or system conditions
- Participants do have risk premiums
- Unknown number of competitors under CTS
- **Not** *ex-ante* efficient

Expected CTS Bidding Patterns

- Assume Competitive Conditions
 - No risk premium (risk neutral), no transactions cost
 - Many competitors drive bids to cost
 - Bidder gets clearing price so bids at cost
- and ISOs schedule the tie efficiently most of the time
- CTS bidders are likely to bid zero, But:
 - Participants are risk-averse
 - Number of competitors is limited
- Therefore:
 - Bids would likely be non-zero due to risk aversion and imperfect competition

Result of CTS Bidding Adder



Summary

- The current system should be replaced with a more efficient alternative
- Tie-Optimization jointly dispatches two systems
 - Joint dispatch takes advantage of information available only to ISOs
- CTS is a significant improvement over the current system but less efficient
 - Bids do not reveal any *new* information
 - Bids would be based on level of risk premiums and imperfections in competition
 - Would result in fewer transactions

Recommendations

- The IMM supports revision of the current system
- IMM recommends Tie-Optimization
 - It is the most efficient given the currently available information and technology
 - CTS offers no benefits over Tie-Optimization and would be less efficient