

Location-Based Pricing Study: Proposed Scope

Market Pricing Working Group, Sept. 1, 2006



Location-Based Pricing Study: Summary of Stakeholder Plan



- As work begins on a day-ahead market, the fundamental question of how prices will be calculated needs to be addressed.
- To provide stakeholders with the opportunity to comment on possible models for locational pricing.
- To seek input on the potential impacts of locational pricing on their operations, the IESO-administered markets and the day-ahead market design work.
- Simulation results to be presented to MPWG at October 6 meeting. Results submitted to SAC by October 18.
- Presentation of results to SAC November 1.

Location-Based Pricing Study: Total Price Comparison



Using historical shadow prices (focusing on the time since MIO implementation-June 2004), we will calculate:

- What prices might look like under several locational pricing models.
- What would the difference be between the uniform and locational prices paid for energy and reserve.
 - Taking into account impacts on CMSC and other uplifts (e.g. Losses)
 - Impacts of rebates and global adjustment
 - Discussion of these price differences.
 - Include adjustments to account for differences between Constrained and Unconstrained calculation where appropriate and possible.

Location-Based Pricing Study: Possible Models

- Nodal – we publish ~250.
- Zonal – we have published 10 zones in the past, which are indicative of historical congestion. Generally, there should be minimal congestion within a zone.
- Regional boundaries, rather than electrical zones.
- One Ontario price based on weighted average of locational prices.
- Different approach for generators/consumers? We can examine different approaches for dispatchable vs. non-dispatchable (i.e. nodal for dispatchable, zonal for non-dispatchable).

Location-Based Pricing Study: Previous Study



- Previous analysis done as part of the Day-Ahead Market project (Oct. 2002-2003).
 - Nodal pricing data history starts Oct 2002.
 - We plan to use post-MIO shadow prices.
- We will be doing a similar analysis, but do not expect the same results. We expect differences based on market changes that have been implemented since 2003, e.g. :
 - MIO
 - Emergency Energy Pricing
 - CAOR
 - DACP
 - Intertie Failure Charges
 - Increased supply available.

Location-Based Pricing Study: Comparison to HOEP



- Since the previous MPWG meeting, we have been investigating the differences between the constrained and unconstrained algorithms.
- For the most part, the constrained and unconstrained sequences solve using the same methodology.
- The outputs of the unconstrained sequence are then capped at \$2000.
 - Action: we will cap the shadow prices at \$2000 for this study.
- Treatment of Energy or OR shortages is identical in both algorithms.
 - No action proposed.

Location-Based Pricing Study: Comparison to HOEP



- **Primary Demand:**
 - Constrained dispatch uses a forecast demand.
 - Unconstrained uses actual PD taken at the end of the interval.
 - No action proposed.
- **MIO vs. Myopic:**
 - Constrained optimizes over 5 critical intervals spread out over the next hour with 1X ramp.
 - Unconstrained optimizes over 1 interval with 12X ramp rate.
 - No action proposed .
- **Generator characteristics:**
 - Constrained respects minimum loading points.
 - No action proposed.

Location-Based Pricing Study: Comparison with Other Markets



- Report on methodologies used in surrounding markets (MISO, PJM, NYISO, ISO-NE).
- For neighbouring markets – comparison of Ontario shadow prices with neighbouring prices.
 - What arbitrage opportunities does this present?
 - How does this address inefficiencies raised by MSP?

Location-Based Pricing Study: Other Market features

- **TR's – Are they required? If so, what type is most appropriate?**
- **Mitigation of local market power:**
 - **Would changes be required?**
- **Compensation for impact on price due to operator actions?**

Location-Based Pricing Study: Possible Transitional Measures

- **TR's**
 - Grandfathered?
 - To whom?
 - For how long?
 - Phased out at what rate?
- **Mitigation of overall price impact?**
 - Continue with both worlds?
 - Gradually phase out unconstrained?

Location-Based Pricing Study: Other Considerations



- **Bidding behaviour will change with any change in pricing methodology.**
 - Some discussion will be provided with results.