Single Schedule Market Pricing Issues

Phase I Discussion

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Topic Schedule - Fundamentals

- **June 2, 2017 - Stakeholder Engagement Session**
  - ✓ Module A - Energy Pricing
  - ✓ Module B - Reserve Pricing
  - ✓ Module C - Constraint Violation Penalties
  - ✓ Module D - Multi-interval Optimization and Pricing
  - ✓ Module E - Pricing Operating Restrictions and Operator Actions

- **June 29, 2017 - Stakeholder Engagement Session**
  - ✓ Module F - Load Pricing and Financial Transmission Rights
  - ✓ Module G - Market Power Mitigation
  - ✓ Module H - Make Whole Payments and Uplift

How will single schedule market prices be determined at each location that are consistent with the physical dispatch of energy and provide efficient incentives for the supply of energy by all types of resources?

- Calculation of locational marginal prices
- Relationship between locational prices and the IESO constrained dispatch and constrained dispatch shadow prices
- Differences between locational prices and IESO unconstrained dispatch prices

How will single schedule market settlements be calculated for energy suppliers and for transactions at the IESO's interties?

- Intertie transaction pricing design
  - Calculation of intertie prices in single schedule markets
  - Review of current IESO intertie pricing design
- Differences between intertie and internal transactions pricing in single schedule markets

Reserve Pricing — Module B

How will reserve prices be determined at each location that are aligned with the physical scheduling of reserves and energy and provide efficient incentives for the supply of reserves by all types of resources?

- Co-optimization and pricing of reserves and energy in IESO unconstrained pricing system
- Co-optimization and pricing of reserves and energy in IESO constrained dispatch and constrained dispatch shadow prices
- Co-optimization and pricing of reserves and energy in other single schedule markets

Constraint Violation Penalties — Module C

How will the market design set appropriate prices when reliability constraints are violated in the dispatch?

- Penalty prices in the IESO constrained dispatch
- Impact of penalty prices on constrained dispatch nodal prices when reliability constraints are violated and in other extreme dispatch solutions
- Relationship between constraint violation penalties and single schedule prices
- Treatment of dispatch solutions that violate reliability constraints in other single schedule electricity markets

Multi-Interval Optimization and Pricing Module D

How will the single schedule prices in the current interval be related to system conditions in subsequent intervals?

- Relationship between multiple interval dispatch optimization and single schedule prices
- Multiple interval optimization in the IESO constrained dispatch
- Multiple interval optimization in other markets

How will the single schedule prices for the current interval be related to dispatch instructions and actual resource performance?

- Relationship between single schedule prices and timing of pricing run
- Difference between scheduling and pricing model runs
- Pricing designs based on dispatch instructions (ex ante) versus dispatch performance (ex post)

Pricing Operating Restrictions and Operator Actions

Module E

Will single schedule prices reflect discrete operator actions and commitment decisions whose cost is not reflected in marginal dispatch prices; if so, how will this be done?

- Treatment of dispatch restrictions (e.g., minimum load blocks and forbidden regions) in IESO unconstrained and constrained pricing
- Treatment of fast starting minimum load block resources in other single schedule market pricing
- Single schedule pricing and operator actions

Load Pricing and Financial Transmission Rights Module F

How will single schedule market settlements be calculated for non-dispatchable loads?

Will the single schedule energy pricing design provide efficient incentives for the participation of dispatchable loads and price responsive loads; if so, how?

Will the single schedule energy pricing design provide efficient incentives for long-run decisions with regard to location, energy efficiency and, potentially, exit by energy intensive consumers that are not currently price responsive?

How might the transition from the status quo to the new design be managed? Will this design include financial transmission rights?

Single schedule energy pricing design for power consumers.

- Energy settlement pricing alternatives for dispatchable loads
- Energy settlement pricing alternatives for non-dispatchable loads
- Interaction between energy pricing for dispatchable and non-dispatchable loads

Design considerations:

- Congestion rents and financial transmission rights
- Marginal energy pricing, average cost of power and the allocation of financial transmission rights and loss residuals

Market Power Mitigation — Module G

How will the single schedule market design avoid undue increases in market prices for energy, reserves or in uplift costs as a result of the exercise of local market power?

- Market power mitigation in the IESO's two schedule system
- Market power mitigation timing in other single schedule pricing systems
- Alternative market power mitigation designs (pivotal supplier tests and conduct and impact tests)
- Determination of prices used for mitigation (reference prices) in IESO and other markets

Make Whole Payments and Uplift — Module H

How will the single schedule market rules ensure that resources have strong incentives to follow dispatch instructions through rules for the payment of uplift?

- Compensation for costs incurred as a result of following dispatch instructions that are not recovered in spot market prices
- CMSC and other make whole payments in two schedule system
- Make whole payments in other single schedule markets

Make Whole Payments and Uplift — Module H

How will the single schedule market rules recover uplift and ancillary services costs and ensure that energy price signals are not distorted by the method for recovering these costs?

- Recovery of make whole payments in uplift charges
- Recovery of ancillary service costs in uplift charges
- Treatment of difference between average and marginal cost of losses