

Retail Settlements Code and Distribution System Code Taskforce Proposed Ontario Market Rules

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Market Design Philosophy: Open Access to Efficient Markets

- ▶ MDC and its consultants were guided by a design philosophy that focused on creating efficient markets and giving everyone access to them
 - ◆ Create a fair and efficient spot market
 - ◆ Design rules that give participants fair, open access to that market
 - ◆ Set market prices that give the right signals
 - ◆ Provide efficient settlements that accommodate both spot and bilateral trading
 - ◆ Make sure *all* consumers can get easy access to the market and market prices, either directly or indirectly

Market Design Directions

- ▶ The MDC was guided by the Government's White Paper. These provided a good foundation:
 - ◆ A bid-based central dispatch and spot market -- run by an Independent Market Operator -- the IMO
 - ◆ Retail choice for all consumers
 - ◆ The breakup of the incumbent integrated utility
- ▶ But there were important limits:
 - ◆ No immediate breakup of the single generator
 - ◆ Imposed uniform pricing prevented efficient pricing of congestion

Designing an Integrated Market

- MDC's recommendations for Ontario can be seen as an effort to design a consistent structure between wholesale and retail; in essence they proposed a single, integrated market
- The MDC's proposed "market rules" apply to the IMO and "wholesale" market participants
- But the total set of recommendations are designed to create a single, consistent market framework that accommodates both "wholesale" and "retail" transactions

Completing the Integrated Market

- The Electricity Act and OEB Act of 1998 gave the OEB the authority to affect many aspects of the retail portion of this integrated market
- MDC's recommended market rules are only half the picture; OEB can complete the picture by extending the design principle of open access to an efficient market down to the retail level
- OEB can help give 20 million consumers open access to a market based on 25,000+ MW of generation

How Would Generators Get Access?

- ▶ Every generator who wants to participate in the IMO-administered markets would submit “dispatch data” to the IMO for each hour
- ▶ Offers to provide energy and/or reserves
 - ◆ The quantities (in MW) offered for each hour
 - ◆ The prices (in \$/MWh) at which each quantity is offered
 - ◆ Physical descriptions of each unit’s abilities to provide the offered service -- how much, how fast, limits, etc
 - ◆ Location and connection points
 - ◆ Offers indicate how much each generator wants to run
- ▶ Offers submitted from day-ahead to hour(s) ahead

How Would Generators Get Access?

- The IMO will rank generator offers according to their bids -- a dispatch schedule or “merit order”
- The IMO will generally follow the merit order in conducting the dispatch in real time
- The IMO will adjust the merit order for congestion
 - ◆ Lower-cost offers are backed off to relieve congestion
 - ◆ Higher cost units are constrained on to meet loads
- All generators who are dispatched based on their offers get access to the IMO-controlled grid
 - ◆ Very small generators can “self schedule” and just run

How Would Loads Get Access?

- ▶ Dispatchable loads -- who can respond to the IMO's dispatch instructions -- will submit bids
 - ◆ The amounts the customer is willing to purchase
 - ◆ The prices the customer is willing to pay for each amount
- ▶ The IMO will develop hourly forecasts of the expected demand by all non-dispatchable loads
 - ◆ Distributors will submit their own forecasts of these loads to help the IMO
 - ◆ Distributors are not bound by their forecasts
 - ◆ They are not committed to purchase the forecast amounts

All Loads Would Be Served by the IMO's Dispatch

- ▶ All dispatchable loads would be served by the IMO's dispatch according to their willingness to pay -- that is, according to their bids
 - ◆ As long as the price is at or below their bids, they will be served -- I.e, they were willing to buy at that price
 - ◆ If the price is above their bids, they will be dispatched off -- I.e., they were not willing to buy at that price
- ▶ All non-dispatchable loads would be served by the the IMO's dispatch, based on the merit order dispatch -- I.e., a willingness to buy at any price

Market Prices for Settlements

- ▶ The IMO dispatch and the offers and bids would define a set of market prices (MP)
- ▶ The IMO would use the market prices in its settlements:
 - ◆ To charge loads for all their purchases at the MP
 - ◆ To pay generators for all their sales at the MP
 - ◆ To settle bilateral transactions that involve the IMO spot market and its settlement system
- ▶ The dispatch, bids/offers, and settlements create a spot market administered by the IMO

How Would Prices Be Determined?

- For the first 18 months, the IMO would derive a uniform price for Ontario by assuming there is never any congestion on the IMO grid
 - ◆ Most of the time, there may be no congestion, and prices would be the same everywhere anyway
 - ◆ When there is congestion, prices will be different at different locations, but Ontario won't use these yet
- After 18 months, the IMO Board could agree to use locational prices that reflect the effects of congestion -- prices would differ locationally
 - ◆ Neighboring US regions will already be doing this

Uniform Pricing Would Apply in Ontario, But not Outside

- ▶ Settlements for all transactions within the IMO control area would use the uniform prices that ignore congestion on the IMO-controlled grid
 - ◆ All “internal” generators receive the uniform price
 - ◆ All “internal” loads pay the uniform price
- ▶ Settlements for exports and import transactions would use prices that reflect the effects of congestion across the interties
 - ◆ Internal participants receive/pay the *uniform* price
 - ◆ External participants receive/pay their “*zonal*” price

Uniform Pricing Would Require the IMO to Make “Side Payments”

- Generators constrained off to relieve congestion must be compensated for their lost opportunity
 - ◆ Payment equals market price minus the offer price
 - ◆ Otherwise, they would resist IMO orders to get off
- Generators constrained on to relieve congestion must be compensated for output above their offers
 - ◆ Payment equals offer price minus the market price
 - ◆ Otherwise, they would refuse ISO order to get on
- These side payments would be reflected in the IMO settlements and charged to all loads

How Would Bilateral Transactions Occur?

- The market design supports both spot trading and bilateral trading -- no discrimination for/against
- Sellers/buyers arrange bilateral deals between themselves -- prices, quantities, terms/conditions
- Sellers tell the IMO about “bilateral quantities” (but not bilateral prices) any time up to a day or so *after* the dispatch day
 - ◆ No need to “schedule” a bilateral transaction in advance
 - ◆ No need to reserve transmission in advance
- IMO uses BQs to complete settlements

IMO Settlements for Bilaterals

Simple Examples

- ▶ Seller contracts to sell 10 MW/hr to Buyer B at \$?
 - ◆ Seller's supplier injects (generates) 10 MW each hour
 - ◆ Seller's customer withdraws (uses) 10 MW each hour
 - ◆ Seller tells IMO: "Bill me for 10 MW BQ for Buyer B"
 - ◆ IMO uses the injections, withdrawals, BQs to settle:
 - ◆ IMO credits Seller for 10 MW/hr for its injections at MC
 - ◆ IMO debits Seller for 10 MW/hr for Buyer B's withdrawals at MP for each hour
 - ◆ IMO sends net invoice to Seller: $10 * MCP - 10 * MCP = \$0$
- ▶ Any combination of purchases, sales, injections, withdrawals is possible; congestion accounted for

IMO Settles “Wholesale” Trades

- The IMO spot market and the IMO settlements would be available for trades by participants who meet the requirements for trading directly with the IMO-coordinated markets
 - ◆ All generators of 1 MW or larger can be dispatched
 - ◆ Smaller generators can sell into spot market
 - ◆ Loads that are at least 1 MW and have hourly interval meters that can be read by the IMO
 - ◆ Wholesale buyers and sellers who trade energy through the IMO markets

‘Retail Settlements’ Extend the IMC Settlement Process to End Users

- ▶ Most smaller end-use consumers will not meet the requirements to deal directly with the IMO
 - ◆ They may not be big enough
 - ◆ They won't have hourly-interval meters read by IMO
- ▶ Retail settlements can use the same settlement principles the IMO uses, but extend them to retail
 - ◆ Use the “spot price” (MC) for settlements
 - ◆ Apply the MPs to retail consumers' usage
 - ◆ Use profiles to estimate hourly usage
 - ◆ Provide access to the market price and facilitate choice

Settlements Would Also Collect for T&D, Uplift, IMO/Market Costs

- IMO would charge wholesale customers for:
 - ◆ Transmission for IMO-controlled grid, using OEB-approved tariffs for each transmission owner
 - ◆ Market uplift and IMO administrative costs
 - ◆ Transmission level losses
- Wholesale customers would be defined as:
 - ◆ Distributors connected to the IMO controlled grid
 - ◆ Participating distributors not connected to IMO grid
 - ◆ Large end-use customers connected to the IMO grid
 - ◆ Other end-use customers that meet the requirements to deal directly with the IMO

Distributor's Role in Market Settlements

- Distributors' "retail settlements" would give smaller end-use consumers -- those who can't deal directly with the IMO -- access to the market and market prices
 - ◆ They would use the IMO's spot prices to "settle" all usage by the distributors' end-use customers
 - ◆ They could allow smaller embedded generators to settle at the same spot prices
- Distributors would use retail settlements to collect distribution costs and to pass IMO's TX, uplift, admin costs through to their retail customers

Importance of the Spot Price Under the Proposed MDC Market Rules

- The spot market price becomes the unifying accounting number that integrates the wholesale and retail settlements in the Ontario market.
 - ◆ The IMO uses the spot price for “wholesale” settlements
 - ◆ Distributors use the spot price for retail settlements
- This common settlement element allows the entire market to function as one market -- all consumers can get access to that market and its prices