Realizing the Value of Price Responsive Load
In Ontario’s Electricity Market

Value of Dispatchability

Many industrial customers in Ontario have (or could develop) the operational flexibility to decide if and when to use certain quantities of electricity. Depending on the cost of achieving or exploiting a load’s operational flexibility, this flexibility has value in the Ontario electricity market that can approach the value of power generation capacity.

Current Market Mechanisms

For registered wholesale market participants, there are two ways to realize value from load flexibility.

Dispatchable Loads

In theory, participation in the wholesale market as a dispatchable load maximizes the value a load can realize for its electricity demand flexibility. Dispatchable loads (DLs) participate in the IMO’s real-time, 5-minute markets, submitting bids to buy electricity. The DL is instructed by the IMO to reduce its power demand when the 5-minute price rises above the price that was bid by the DL. If the DL bids a price that represented the point where power becomes “too expensive” for the load’s operation, then the DL avoids operating losses by being dispatched off at this price.

DLs can also offer their load flexibility to two classes (“10N” and “30R”) of operating reserve (OR). Operating reserve represents the IMO’s “wiggle room”, in the form of generation that is prepared to be on stand-by to come on line quickly, or load that is prepared to go off-line quickly, to enable the IMO to maintain system stability in the event that demand or supply changes abruptly (for example, if a large generator or transmission resource should fail). When submitting its bid for energy, a DL can also offer its flexibility into one of these two OR markets. The IMO does not call on OR very often and when it does, not all reserved OR is activated.

A third form of value DLs (and generators) can earn is from Congestion Management. Even if the IMO’s real time price for power is below the price bid by the DL, local conditions could make power more valuable in the area in which the load is operating. In these circumstances, the DL could be dispatched off, and compensated for not taking power even though the power price was at a level that the DL was prepared to pay, as indicated by its bid.

Non-dispatchable Loads

Most power users are non-dispatchable loads (NDLs). They take power according to their needs. Many non-dispatchable loads nevertheless have the ability to manage their power demand in response to price, and do so voluntarily (essentially, “self-dispatching”). But the value self-dispatchers get is limited to the benefit of avoiding the use of power that is “too expensive”.

Self-dispatchers may have as their only price signal the after-the-fact Hourly Ontario Energy Price or the pre-dispatch price published on the IMO’s “Today’s Market” web page.

To date, there has been a frequent disconnect between pre-dispatch and dispatch prices. The actual dispatch price often is significantly different from what was anticipated from the pre-dispatch price. This has made the task of self-dispatch very challenging and prone to error. In the
case where a load self-dispatches off at a pre-dispatch price just above its break-even power price and then sees the actual dispatch price plummet, the load incurs an opportunity cost due to the loss of profitable production. This problem has been chronic, with a large contributing factor being the IMO’s inability to anticipate how much price-responsive load is considering self-dispatching off and at what price levels.

Self-dispatchers can also incur losses by continuing to take electricity and then finding out that the dispatch price was higher than indicated in the pre-dispatch, and is in fact above their break-even price. This problem has not been as frequent as the earlier discussed problem of lower than expected dispatch prices.

**Inter-tie Offer Guarantees**

Inter-tie Offer Guarantees (IOGs) arise from the nature of import transactions across inter-ties between Ontario and neighbouring jurisdictions. These transactions are scheduled on a one-hour basis, one hour in advance of the dispatch hour.

The IMO schedules imports in periods when it determines that imports are needed to meet Ontario’s domestic power demand. Because the import is scheduled one-hour in advance (and not in real time), pre-dispatch prices are used to commit the import (that is, the importer is guaranteed their offer price as it appeared in the pre-dispatch, when the decision was made to dispatch the import).

If the dispatch price turns out to be lower than the price committed for the import, the IOGs make up the difference between the dispatch price paid to the importer in real-time and the (higher) pre-dispatch price at which their power was committed into the Ontario market.

**New Market Mechanism -- Hour Ahead Dispatchable Load**

To try to exploit the price responsiveness of load in an efficient way, for the benefit of all market participants, the IMO is developing a new market mechanism, called the Hour Ahead Dispatchable Load (HADL) program.

HADL would be offered to market participants that presently are non-dispatchable loads. Under this program, qualifying loads will have the option to offer part or all of their load flexibility to the IMO. Unlike the real-time dispatchable load, dispatch of this HADL will occur on a discrete-hour basis and 3 hours in advance (for example, at about 1:00 p.m. for the period 4:00 – 5:00 p.m.). This gives the load more time to respond, and greater certainty about their status for their hour in question. Under operating circumstances where the load does not wish to risk being dispatched off, it can simply bid a higher price for power (right up to the Maximum Market Clearing Price).

Similar to inter-tie offers, HADL participants will be “kept whole” by the IMO, with Hour Ahead Dispatchable Load Offer Guarantee (HADLOG) payments. The HADL will be dispatched based on the pre-dispatch price, and if the dispatch price turns out to be lower, the HADL will receive a HADLOG payment for the difference.

One immediate benefit for HADL participants will be price-certainty related to their dispatch. This means HADLs can avoid incurring an operating loss if actual prices come in below the “dispatch-off” threshold after the dispatch-off decision has been made.

**Cost/Benefit Considerations**

Analysis by the IMO of data from July – September 2002 indicates the total value of HADLOGs was in excess of $130,000 / MW of HADL. Their evaluation of one month suggested roughly 75% of this could be realized by offering in HADL at “average” values.
Naturally, different loads might expect to face different levels of cost and complexity in can exploiting the HADL mechanism. When developing a short- or long-term plan for realizing value from flexible load, customers will need to consider the following:

- Break-even operating cost, possibly under varying conditions
- Production schedules and budgets
- Avoided costs from production down turns
- Operating Reserve revenues and likelihood of activation
- Congestion Management Payment revenues and strategies for maximizing them
- Hour Ahead Dispatchable Load Offer Guarantee payments and strategies for maximizing them
- Metering
- Compliance costs

Given these considerations, load dispatchability, either in the real-time market or in the hour-ahead market, can represent an important strategy for managing electricity cost and electricity price risk.