Dispatchable Loads

Introduction

This Quick Take provides a high level description of the implications of becoming a dispatchable load. It provides basic information that loads considering becoming dispatchable can use as a starting point.

Background

Below is a table that summarizes the main differences between dispatchable and non-dispatchable loads in the IESO-administered markets:

	Dispatchable	Non-Dispatchable
Responding to Price	• Submits bids to buy energy • IESO instructs load to adjust operations based on submitted bid price	• Consumes as required • May adjust operations based on their own analysis of pre-dispatch or real-time prices
Operating Reserve (More Information about Operating Reserve)	Can offer 10-minute spinning, 10-minute non-spinning, and 30-minute operating reserve	Cannot offer operating reserve
Settlement Price	5-minute Market Clearing Price	Hourly Ontario Energy Price (HOEP)
Congestion Management Settlement Credits (CMSC)	May receive CMSC if conditions require the facility to be dispatched differently than they would have been based solely on economics	Does not receive CMSC

In order for a load to become dispatchable, it must be capable of changing at least a portion of its consumption within five minutes if instructed by the IESO. The load must be capable of receiving and responding to dispatch instructions from the IESO 24 hours a day, 365 days a year.

The primary reasons that loads choose to become dispatchable are:

- They can offer operating reserve—which is stand-by power or demand reduction that can be called on with short notice to deal with unexpected events in generation and loads—and thereby receive an additional revenue stream. Depending upon how often their offer is selected and the current market clearing price, this revenue can be considerable.
- The IESO will direct the load's operations based on the price of energy and the load's bid. This leads to accurate response to real-time prices in comparison to the load attempting to respond on their own to pre-dispatch or real-time uniform price signals, which may be administered after-the-fact.

Bids and Offers

Dispatchable load facilities must enter bids to purchase electricity, and, if desired, offers to supply operating reserve. Bids and offers are submitted via the web-based Market Participant Interface (MPI) tool.

Bids and offers can be of two types:

- Daily
- Standing

Daily bids and offers must be entered between 6:00 and 10:00 EST the day before the dispatch day in order to fulfill the requirements of the Day-Ahead Commitment Process. For more information, see the *Guide to the Day-Ahead Commitment Process*.

Standing bids and offers are appropriate if a load's price sensitivity is unlikely to change over a period of time. Standing bids and offers remain in effect either indefinitely or until a specified expiry date.

Facility ramp rates are input with bids and offers. These tell us how quickly a load can increase or decrease its consumption. Submitted ramp rates are used to determine dispatch instructions. For a complete explanation of the process of entering energy bids and OR offers, please see the guides available on the Participant Tool Training webpage.

Facility Dispatch

A uniform five-minute market clearing price (MCP) is used to settle dispatchable facilities in Ontario. The unconstrained dispatch algorithm determines the market clearing price while ignoring the physical realities of the grid (losses and transmission limits). However, the constrained dispatch algorithm takes these factors into account when it derives dispatch instructions. At the same time, it calculates locational or shadow prices for a number of points on the transmission grid called nodes. Each node represents the physical location on the transmission system where energy is injected by generators or withdrawn by loads. The price at each node represents the locational value of the energy, which includes the marginal cost of the energy and the marginal cost of delivering it, i.e., losses and congestion. Dispatch instructions for a facility correspond to the shadow price at its node rather than the uniform market clearing price.

Because dispatch instructions do not correlate to the uniform MCP, there can be situations where a facility whose bid appears to be economic will not be dispatched. For example, assume that Load A bid for 100 MW at $200. In real-time, MCP comes in at $100, but the shadow price for Load A's node is $1,000.

In this situation, although Load A's bid was economic, it would not be scheduled. Load A would receive a congestion management settlement credit (CMSC) in compensation for being dispatched off. For more information on CMSC, please see *Introduction to Ontario's Physical Markets*.

A dispatchable facility's shadow price, therefore, must be taken into consideration when bidding. A selection of shadow prices is posted on the IESO's Public Reports page. Open the file 'RealtimeShadowPrices'. If you require help interpreting this report, or if an appropriate shadow price for your facility is not shown, please contact Customer Relations at 1-888-448-7777 for assistance.

Ramp Rates

When determining dispatch instructions, the IESO takes the submitted ramp rate for the facility and the facility's current operating point into consideration. For example, assume that Facility A bids for 150 MW at $250 per MW, with a ramp rate of 10 MW/minute. The shadow price is currently $240, and Facility A is consuming 150 MW. Assume that the shadow price rises in the next interval to $260. Facility A does not wish to consume at this price level. However, it can only ramp 10 MW/minute. Therefore, it cannot reduce its consumption fast enough to move to 0 MW in the next 5-minute interval. The lowest consumption point it can reach by the end of the next interval is 100 MW. Therefore, the facility will be dispatched to 100 MW by the IESO. Note

that when a load's dispatch is restricted by a very low ramp rate, it will not normally be entitled to a CMSC payment.

Joint Optimization

The IESO simultaneously sets prices and schedules in both the energy and operating reserve markets. As a result, the dispatch of facilities is affected by the interplay of the requirements of the two markets. For more information on joint optimization, please see *Quick Take: Joint Optimization of Energy and Operating Reserve.*

Dispatch Instruction Process

In order to receive dispatch instructions from the IESO, a dispatchable facility must set up a dispatch workstation. This is a dedicated computer linked to the IESO via a frame relay. The IESO will assist with the set-up of this workstation.

The IESO issues dispatch instructions only if there is a change required in the quantity of energy withdrawn or operating reserve scheduled or activated relative to the facility's most recent dispatch instruction. If no dispatch instruction is received for an interval, no action is required.

There are circumstances under which a dispatch instruction can be rejected by a facility. Compliance with dispatch is not required if doing so would:

- Endanger the safety of any person
- Damage equipment, or
- Violate any law

If a dispatch instruction has been accepted, it must be complied with. Non-compliance with dispatch instructions is considered a breach of the market rules. An exemption from the market rules can be applied for if a facility would have difficulty complying with dispatch instructions due to its physical operating characteristics. For additional information on dispatch instructions, see the *Introduction to Ontario's Physical Markets* workbook.

Enabling Load Participation

A load's processes are designed around their primary business objective: generally, production of some commodity other than electricity. Consequently, the processes and rules that apply to dispatchable facilities can be a challenge for dispatchable loads to follow. The *Dispatchable Load Operating Guide* summarizes the unique issues that dispatchable loads face.

Process to Become Dispatchable

Once the decision has been made to become dispatchable, there are a number of potential activities required. The most common tasks include:

- Arranging for required access to systems within the IESO Portal
- Setting up a dispatch workstation to receive web-based dispatch instructions
- Updating metering and telemetry, if required
- Taking additional training

The entire process normally takes 5 to 9 months to complete. Most of this time is required to install circuits and equipment needed for telemetry, to set up the dispatch workstation and to update the IESO real-time database and system model. If you are considering becoming dispatchable, send an email to market.registration@ieso.ca.

Summary

If a load can adjust some portion of its consumption based on 5-minute dispatch, it can choose to register as dispatchable within the IESO-administered markets. While requiring some additional upfront costs and ongoing effort, dispatchability has the advantages of allowing a market participant to:

- Receive an ongoing revenue stream by participating in the operating reserve market
- Receive CMSC payments when appropriate
- Much more effectively respond to price

If a load becomes dispatchable and later determines that they would prefer to return to a non-dispatchable status, this can be accommodated.

Additional Resources

Available on the IESO Marketplace Training webpages:

Introduction to Ontario's Physical Markets
Participant Tool Training webpage
Dispatchable Load Operating Guide
QT - Joint Optimization of Energy and Operating Reserve
Guide to the Day-Ahead Commitment Process

Contact Us

For additional information, please contact us at:

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IESO Quick Takes provide the Ontario electricity sector with insights into specific initiatives or issues. Market participants should ensure that they read and understand the specific obligations in the market rules and market manuals for their participation in Ontario's electricity market. For more information, please email us at customer.relations@ieso.ca.