



## Entering and Revising Schedules and Forecasts

IESO Training

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## Entering and Revising Schedules and Forecasts

### AN IESO TRAINING PUBLICATION

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## 1. Introduction

There are two classes of non-dispatchable generators: self-scheduling and intermittent. For these types of generators, you must tell us<sup>1</sup> the amount of energy you intend to inject into the grid. We call this information a 'schedule' when submitted for a self-scheduling generator, and a 'forecast' when submitted for an intermittent generator.

This guide explains:

- When you have to enter a schedule or forecast
- When you have to update existing schedules and forecasts
- Why you have to submit schedules and forecasts

### **System Operations Training**

You can find additional training material on our [Training](#) web pages, including:

- The [Energy Market Graphical User Interface Workspace Guide](#): Gives detailed instructions on entering schedules and forecasts.
- [Simulations](#): Allow you to practice using the Energy Market Graphical User Interface Workspace to enter a schedule or forecast in a controlled environment.

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<sup>1</sup> In this document, 'we', 'us' and 'our' refer to the IESO. 'You' refers to the market participant.

## 2. Entering and Revising Schedules and Forecasts

We have to continuously balance the supply of energy with the demand for energy. We do this by adjusting dispatchable participants' output and consumption, based on their bids and offers and on the physical capability of the grid. We must know how much energy is available at any given time so we can develop dispatch instructions.

The supply of energy within Ontario comes from two sources:

- Dispatchable resources such as large generators
- Non-dispatchable generators such as wind facilities

Dispatchable participants tell us how much energy they have available by submitting offers. Offers tell us how much energy the participant wishes to sell and at what price. We then develop dispatch instructions using this information as a basis.

Non-dispatchable generators don't enter offers, and they don't receive dispatch instructions. Instead, they provide us with schedules or forecasts indicating:

- The quantity of energy they expect to produce
- The hours during which they expect to produce it
- A price at which they reasonably expect to reduce their output to zero rather than sell into the market

Non-dispatchable generators then produce energy in real-time, according to their submitted schedules without receiving dispatch instructions from us.<sup>2</sup>

### **Standing and Daily Schedules**

You can enter either 'standing' or 'daily' schedules:

- A standing schedule remains in the system until either:
  - The expiry date you indicated, or
  - You withdraw the standing schedule.

You should use a standing schedule if you don't expect your facility's output to vary from day-to-day.

You can enter new standing schedules as early as one week before they are to be applied.

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<sup>2</sup> Please note that schedules and forecasts contain the same information and are submitted using the same process. Therefore, we use the word 'schedule' to refer to both schedules and forecasts for the remainder of this document.

- Daily schedules apply for only one day. Use a daily schedule if you expect your facility's output to vary from one day to the next.

### **Day-Ahead Commitment Process (DACP)**

You have to enter a schedule for your non-dispatchable generator between 6:00 a.m. and 10:00 a.m. day-ahead. For example, if you plan to operate on Tuesday, you have to enter a schedule between 6:00 a.m. and 10:00 a.m. on Monday. This information is important because it affects the scheduling of other resources during the Day-Ahead Commitment Process.

Once you have entered your schedule or forecast, you can revise it as long as you follow the revision rules (see the next section).

### **Revising Schedules**

You may need to change a schedule after you have entered it. For example, you may need to change the schedule for a hydroelectric facility because of under-predicted water levels.

Your ability to revise a schedule depends on how far in advance of the dispatch hour it is when you want to make the change. The schedule revision timeline has three periods:

1. The unrestricted window: closes two hours before the dispatch hour
2. The mandatory window: runs from two hours before the dispatch hour to ten minutes before the dispatch hour
3. The dispatch hour: the hour during which the energy is actually being produced

### **Changes to Daily Schedules for Hours in the Unrestricted Window**

You can enter and change your schedule without restriction up until two hours before the dispatch hour. For example, assume you enter a schedule on Wednesday at 7:00 a.m. indicating 100 MW of wind output between noon and 1:00 p.m. on Thursday. Later, you determine that you will only be able to produce 50 MW because of lower than predicted wind levels. You can change your schedule for the hour from noon to 1:00 p.m. without restrictions as late as 9:59 a.m. – please note, the IESO-administered markets operate on Eastern Standard Time (EST) year round

### **Changes to Daily Schedules for Hours in the Mandatory Window**

You cannot submit new schedules during the mandatory window. You can change existing schedules, but only with our approval. We will normally approve the change, unless it poses grid reliability issues.

You must change the schedule for any hours that are in the mandatory window if your generator's ability to produce energy differs by a material amount from your submitted schedule. An amount is considered material if you will not be able to produce within the greater of  $\pm 10$  MW or  $\pm 2\%$  of your submitted schedule

This change in production ability can result, for example, from a forced outage, or it can occur if you determine that following the existing schedule would:

- Endanger public or worker safety,
- Violate any applicable laws,
- Cause equipment damage, or
- Harm the environment.

For example:

- You initially submitted a schedule for 40 MW for a wind power facility
- During the mandatory window, wind conditions indicate that production will be reduced to 5 MW
- You would need to update your schedule to reflect this change.

If your generator has a maximum capacity of 10 MW or less, you do not have to update your schedules for hours within the mandatory window. However, we encourage you to do so, especially if you are having a total outage. Updating your schedule will help us with balancing the grid.

### **Changes to Daily Schedules During the Dispatch Hour**

A generator's ability to produce energy may also change after the mandatory window has closed (i.e., after 10 minutes before the start of the dispatch hour, or during the dispatch hour). However, you can't change the schedule for the current hour. Instead, you must contact our control room as soon as practical if your generator becomes unable to meet your submitted schedule within the material amount noted on page 4.

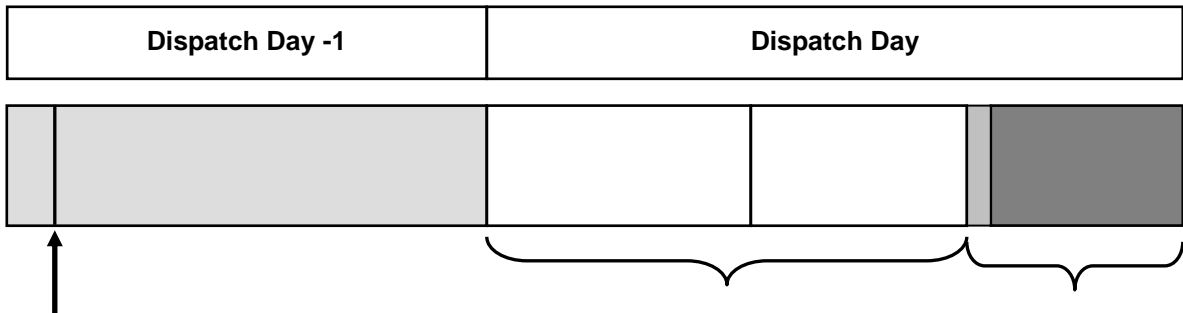
You must also submit revised schedules for future hours if you expect that your inability to follow your submitted schedule will continue.

For example:

- Assume that at 12:15 a.m. a forced outage reduced your generator's output by 21 MW. You expect the outage to last for four hours, ending at 4:15 a.m.
- In this case, you would need to call us and inform us of the situation for the current hour.
- You would also need to ask us for approval to change your schedules for the hours from 1:00 a.m. to 3:00 a.m. Upon our approval, you would then need to enter revised schedules for those hours.

- You would also need to enter a new schedule for the hour from 3:00 a.m. to 4:00 a.m. You would not need to ask permission to make this change because this hour is outside of the mandatory window.
- You would not have to change your schedule for the hour from 4:00 a.m. to 5:00 a.m. because you expect your output to return to normal during that hour.

**Schedule Submission Timeline**



**6:00 a.m.**

- New daily schedules may be entered
- Standing schedules convert to daily schedules
- You must enter a schedule by 10:00 a.m. to meet Day-Ahead Commitment Process requirements

**Mandatory Window:**

- (2 hours before the dispatch hour to 10 minutes before the dispatch hour)
- Changes to schedule allowed only if we approve the change

**Dispatch Hour**

- No changes to schedules allowed.
- Call us if there is a material difference to the amount your facility is able to deliver (see page 4)



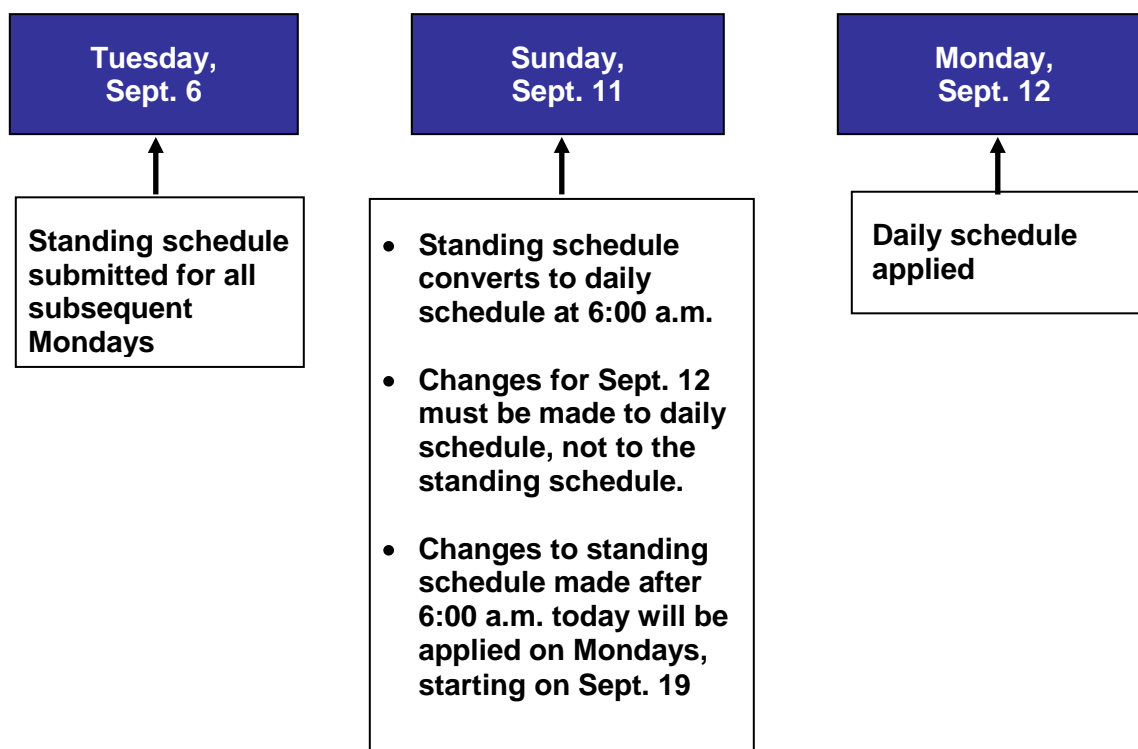
### Changes to Standing Schedules

Our system must convert standing schedules to daily schedules before they can be used. This conversion occurs at 6 a.m. on the day before the dispatch day. For example, a standing schedule for every Monday would convert to a daily schedule at 6 a.m. every Sunday.

Because of this conversion, changes to standing schedules made after 6:00 a.m. do not apply until two days later. For example, to change your standing schedule for Mondays, you have to enter the change before 6 a.m. on Sunday morning. Changes after 6 a.m. on Sunday would not be applied until the following Monday.

If you need to change a standing schedule for the next day, you would have to change the daily schedule that was created when the standing schedule was converted. In this case, if it is after 6 a.m. on Sunday and you need to change the schedule for the next day, it would be too late to change the standing schedule. Instead, you would change the daily schedule created for Monday.

For example:

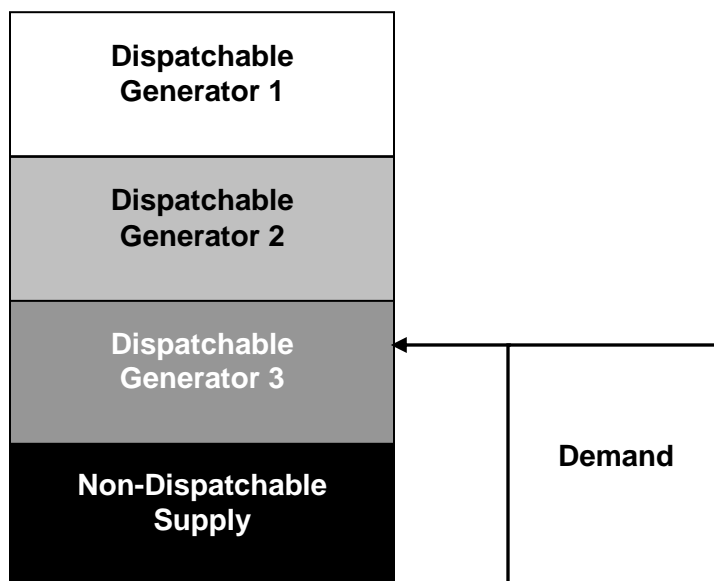


### The Importance of Schedule Compliance

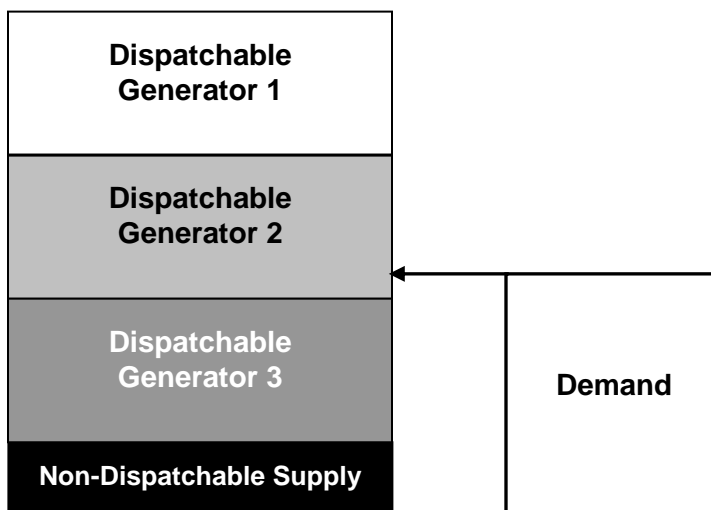
We have responsibility for ensuring that the supply of energy matches the demand for energy on a moment-by-moment basis. To do this, we send dispatch instructions to dispatchable suppliers within Ontario and we schedule imports from other jurisdictions.

The amount of energy obtained from these sources is over and above the expected supply from non-dispatchable generators. In other words, we first make an assumption about the energy that non-dispatchable generators will produce based on their submitted schedules, and then arrange for sufficient supply from other sources to meet expected demand. This means that the failure of non-dispatchable generators to produce according to their submitted schedules can have an adverse effect on the reliability of the grid and on the overall cost of electricity in Ontario.

For example, assume that we are developing dispatch instructions using the supply stack below. The bottom layer represents the supply that we expect to receive from non-dispatchable generators based on the schedules they have entered. The dispatchable supply above that is ranked economically, from least expensive to most expensive. With demand expected at the level represented below, we would dispatch Generator 3 up to the level of the demand arrow. We would not need to dispatch the more expensive Generators 1 and 2.



What happens if the non-dispatchable supply fails to meet its expected schedule? This situation is represented below by the narrower non-dispatchable supply band:



If non-dispatchable suppliers fail to meet their schedules, the already dispatched supply will fall short of demand. We will have to take action to deal with the shortfall. Such actions could involve:

- Sending a dispatch instruction to Generator 2, even though they were not economic. This increases costs to the market as Generator 2 must be compensated up to the level of their offer price.
- If Generator 2 is not able to increase its output quickly enough to make up for the shortfall, we might:
  - Dispatch Generator 1 if that generator is a faster moving unit. Again, costs will increase, as Generator 1 is even less economic than Generator 2.
  - Activate operating reserve (OR) to temporarily make up the shortfall until Generator 2 is able to increase its output. This also increases costs as the activated OR must be replaced with more expensive OR supply.
- If no supplier in Ontario is able to make up the shortfall quickly enough, we might have to purchase emergency energy from another jurisdiction, such as New York. This cost is also passed on to the market.
- We may also have to take more rigorous measures in order to maintain the reliability of the grid, including such actions as reducing system voltage or curtailing exports

Non-compliance with submitted schedules also impacts imports. Import schedules are set in advance of the hour, taking expected non-dispatchable supply into consideration. These import schedules are then fixed for the hour. This means that we can't access any

additional imports during the dispatch hour (except by emergency purchase) even if more energy is required because of the failure to match schedules.

### Summary

Self-scheduling and intermittent generators are an important part of Ontario's supply picture. These generators must submit schedules or forecasts that indicate the quantity of energy they expect to inject and when they expect to inject it. Keeping these schedules up-to-date is vital, as it helps us maintain the reliability of the grid.

### Additional Information

For information on entering and revising schedules and forecasts, please see:

- The *Energy Market Graphical User Interface Workspace Guide*, available via the [Training](#) web pages.
- Information on the criteria for making short notice changes to dispatch data is also available in Appendix C in *Market Manual 4.2, Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets*, available on the [Rules and Manuals](#) web page

For more information on the Day-Ahead Commitment Process, please see:

- The [Training](#) web pages for DACP recorded presentations and the 'Guide to the Day-Ahead Commitment Process'
- Market Manuals 9.0 through 9.5 concerning the DACP, available on the [Rules and Manuals](#) web page