

Enabling System Flexibility

June 24, 2016

Meeting Notes

Date held: June 24, 2016	Time held: 09:00 – 12:00 pm	Location held: Crowne Plaza, Toronto Airport
Company Name	Attended	Attendance Status (A)ttended; (R) Registered; (S)ubstitute; (TC) Teleconference; (P) Presenter
Registered to attend in person were:		
Ameresco	Fonger, Jim	A
Brookfield Renewable Energy	St-Onge, Daniel	A
CanWEA	Giannetta, Brandy	A
Charles River & Associates	Rivard, Brian	A
Constant Power Inc.	Fuerth, Dillon	A
Constant Power Inc.	Koblinsky, Robert	R
Constant Power Inc.	Game, Jonathan	A
Customized Energy Solutions	Chintapalli, Raj	A
Enbridge Gas Distribution	Teichroeb, David	A
Energy Storage Ontario	Phillips, Patricia	R
FN Power	Ng, Guy	R
ENGIE Canada	Hiltz, Bonnie	A
Goreway Power Station	Coulbeck, Rob	A
Goreway Power Station	Sutherland, Chris	A
Goreway Power Station	Coyle, Emma	A
H2O Power LP	DeBay, Francis	R
Hydrogenics Corp.	Harvey, Rob	R
Hydrogenics Corp.	Ibrahim, Ahmad	A
Hydrogenics Corp.	Murray, Anna	A
Ivaco Rolling Mills	Abdelnour, Francois	A
Market Surveillance Panel	Shalaby, Amir	A
NextEra Energy Canada	Gilmour, Charles	A
Nipissing First Nation	Harney, Michael	R
Northland Power	Samant, Sushil	A
Northland Power	Wright, John	A
NRStor Inc.	Rioux, Jason	R
Ontario Federation of Agriculture	Nokes, Ian	A
Ontario Power Generation	Wizniak, Lynn	A
Ontario Society of Professional Engineers (OSPE)	Acchione, Paul	A
Ontario Society of Professional Engineers (OSPE)	Busheri, Hezek	A
ORTECH Consulting Inc.	Roeper, Uwe	A
Power Advisory LLC	Chee-Aloy, Jason	R

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Power Advisory LLC	Cumming, Alison	A
Resolute Forest Products	Opaski, Larry	A
Rob Cary & Associates	Cary, Rob	A
Rodan Energy Solutions Inc.	Goddard, Rick	A
South Cott Ventures	Lampe, Aaron	A
TransCanada Energy Ltd.	Mikkelsen, John	A
Workbench Corp.	Jayapalan, Jennifer	A
Workbench Corp.	Sears, Heather	A
WSP Group	Krause, Don	A
IESO	Agavrioloai, Ioan	A
IESO	Backman, Karen	A
IESO	Drake, Gordon	A
IESO	Ellard, Barbara	A
IESO	Goyal, Reena	A
IESO	Hall, Spencer	A
IESO	Hartland, Mark	A
IESO	King, Ryan	A
IESO	Kula, Leonard	A
IESO	Maria, Ahmed	A
IESO	Matsugu, Darren	A
IESO	Ng, Hok	A
Registered to participate via teleconferencing		
Atlantic Power Corporation	Forget, Ryan	TC
Brookfield Renewable Power Inc.	Wu, Julien	TC
Bruce Power	Xu, Jennifer	TC
Goreway Power Station	Cai, David	TC
HQ Energy Marketing	Plante, Matthieu	TC
Hydro Quebec Energy Marketing	Belanger, Frederic	TC
NextEra Energy Canada	Tuck, Jennifer	TC
RBC Capital Markets	Doolittle, Robin	TC
Shell Energy	Kerr, Paul	TC
TransAlta Corporation	Nguyen, Thanh	TC
TransCanada Energy Ltd.	Kuntz, Margaret	TC
Veresen Inc.	Jessa, Riaz	TC

All meeting material is available on the IESO web site at:

<http://www.ieso.ca/Pages/Participate/Stakeholder-Engagement/Enabling-System-Flexibility.aspx>

1. Introduction by Ryan King (Advisor at Engagement Group at IESO)

This was the first meeting of the Enabling System Flexibility Stakeholder Engagement. Ryan King (IESO) welcomed the attendees and outlined the meeting agenda. The purpose of the meeting was to ensure stakeholders understand the flexibility need identified, and to include them in the identification and evaluation of possible solutions.

2. Stakeholder Engagement – Darren Matsugu

Darren Matsugu continued on from the introduction by emphasizing that the IESO does not currently have a preferred solution or set of solutions. The intention of this meeting is not to get into design details, but to identify exactly what the flexibility need is and look, at a high level, at the types of potential options which can be considered to address that need. Stakeholder feedback from this session will be reviewed and a list of potential options will be discussed at future meetings.

3. Operability assessment – Ahmed Maria

Ahmed Maria described the operating challenges that the IESO would like to address with additional flexibility. The quantity and timing of variable generation output is less predictable than that of conventional generation, which makes it difficult to efficiently commit non-quick start resources or schedule transactions on the interties. Recent assessments have shown that increases in variable generation have led to the need for more flexibility on the system. Over-forecasting the output of the variable generation fleet ahead of real time may create a reliability issue, as insufficient resources may be available in real-time to satisfy Ontario demand. In addition, most supply resources in Ontario are not very responsive (e.g. slow to come online or subject to environmental restrictions), which makes it challenging in real-time to manage a situation where the output of the variable generation fleet was over-forecasted. This operational challenge is not unique to Ontario and other jurisdictions have had similar experiences as their supply mix evolved.

To manage this operating challenge, recent operability assessments have identified the need for additional flexibility on the system. In this context, having additional flexibility means having resources on the system that can provide energy within 30 minutes, if required.

Q&A

Attendee question: Does the supply mix in the slides reflect the information in the LTEP? For example, the LTEP shows a 10% of capacity from DR while the slides indicate 2%.

IESO: The IESO took this question back for follow up.

The IESO note the assumptions used to produce the information in the Enabling System Flexibility deck have been updated from the LTEP 2013 to reflect current conditions. Please note that the footnote on page 35 of the LTEP 2013 indicated that 10% of forecast net demand in 2025 could be served by Demand Management capacity. This Demand Management capacity

includes Industrial Conservation Initiative, Time-of-Use rates, Peaksaver, as well as Demand Response resources. Slide 9 from the Enabling System Flexibility deck is referring to the percentage of total installed capacity in 2020 expected to be served by Demand Response (DR) only.

Along with the LTEP 2013 release, Module 3 (see link below) “Generation and Conservation Tabulations and the Supply/Demand Balance” includes an Excel spreadsheet with forecast yearly installed capacity numbers. The forecast installed capacity of DR in 2020 presented in the Module 3 spreadsheet is approximately 2% of total installed capacity, which is the same as what is presented in the Enabling Flexibility Deck for 2020.

<http://www.powerauthority.on.ca/power-planning/long-term-energy-plan-2013>

Attendee question: What is the capacity need in the future?

IESO: We anticipate there is sufficient capacity and energy over the period assessed.

Attendee question: Does the forecast data that was presented in the slides include transmission connected and distribution connected resources? Are there any plans to include generation lower than 5MW in the forecasting tool?

IESO: The IESO presented data illustrating our ability to forecast the output of the resources directly connected to the IESO controlled grid. In our operability studies, the assumption was that our ability to forecast the output of embedded resources will be similar if not worse to what was presented.

The IESO receives meteorological data from all directly connected resources and embedded resources greater than 5 MW and the output of those facilities are forecasted, in part, based on that data. However, the IESO does not require embedded resources that are less than 5 MW to submit meteorological data. Instead, embedded resources that are less than 5 MW are included as part of the demand forecast. Requiring resources less than 5 MW to provide meteorological data isn't something that the IESO is currently considering.

Attendee question: Has the IESO looked at the generation mix beyond 2020 as a part of this assessment?

IESO: The focus of the more recent operability studies was up to the year 2020.

Attendee question: Have you conducted a sensitivity analysis using LRP I and II in the operability analysis?

IESO: In recent operability assessments not all LRP results were available. Instead, estimates of contributions from LRP I and II were used.

Attendee question: Have we looked at storage and could this be used as part of the solution?

IESO: The use of energy storage would be considered as we explore different options for enabling flexibility – a recent energy storage report published by the IESO indicated that energy storage technologies have the technical characteristics to meet the IESO's flexibility needs.

4. Current approach to managing the issue - Ahmed Maria / Hok Ng

Ahmed provided an overview of the current practices to manage flexibility. These include adjusting the variable generation forecast, manually dispatching resources, and mid-hour export curtailments. Examples were then given for two days where unexpected over-forecasts in wind led to increased prices and the actions that were taken to mitigate this (see slides).

Q&A

Attendee question: What is the main reason for price spikes – is this a result of imports?

IESO: The price is a result of more expensive resources being dispatched. Imports are scheduled in the hour-ahead pre-dispatch and cannot directly set price.

Attendee question: Is there compensation for curtailing exports?

IESO: Depending on the reason for curtailment, Congestion Management Settlement Credits (CMSC) may be paid.

Attendee question: At any given time, what capacity is available for sub 1-hour response?

IESO: Assuming that there isn't any spare capacity on resources that are already synchronized to the Ontario power system, there is approximately 400 MW of capacity that can come online, synchronize to the grid and inject its full output within an hour.

Attendee question: Did the IESO consider the existing flexibility on the system (i.e. the 400 MW mentioned above) in the numbers presented on slide 17?

IESO: No, the numbers on the slide did not take into account the flexibility that we already have from existing resources.

Attendee question: Is the over forecasting in part caused by smaller embedded generation not being included and should the IESO include generation below 5MW?

IESO: For the April 21 example, the forecasting error was not caused by embedded generation. In the distribution system there is about 2500 MW of embedded generation of which the IESO has visibility to approximately 1900 MW. Therefore, there is 600 MW of generation under 5 MW in Ontario that the IESO has no visibility to from the control room. An estimate of the embedded generation not visible is netted from the demand forecast.

Attendee question: Have we looked at June 9th as an example of wind over forecasting?

IESO: The materials for this meeting were prepared before this event, but the IESO may review at a later date.

5. Options to address the need – Gordon Drake

The IESO has identified that it is targeting to have 300 MW of additional flexibility by the end of 2017 and 1000 MW by the end of 2018 (i.e. the IESO will enable 700 MW of additional flexibility in 2018). The challenge therefore is to implement a solution that meets this short term need but that will also be effective in the long term. Any solutions developed to meet this need in the short term will be designed in such a way that they do not undermine the development of longer term solutions.

In assessing which options are best, the IESO's approach will be technology-neutral and encourage competition for vendors that can provide effective price signals. There is a range of options that we could consider, such as improving the mechanisms and price signals we currently have in place, or to explore potential new market products.

Q&A

Attendee question: Have you done a granular assessment of the regional need taking into account transmission constraints?

IESO: Transmission constraints can limit the amount of power a resource can inject into the system when called upon within the hour to address an over-forecast error (i.e. can limit the ability of a resource to provide flexibility). Therefore, transmission constraints will have to be considered when deciding how to meet the flexibility needs of the province. For example, it is well known that the transmission system in the north is often congested, which would likely limit the amount of flexibility that we can get from resources in that part of the system.

Attendee question: Are transmission investment options being considered within the realm of solutions to meet flexibility needs?

IESO: At this point, the IESO is interested in encouraging stakeholder input on a wide variety of solutions that could address the identified need for flexibility. All solutions will need to be measured against a number of consistent principles in order to evaluate them appropriately.

Attendee question: How does this stakeholder session tie up with the rest of Market Renewal?

IESO: Once we have had the opportunity, through this stakeholder engagement, to identify specific market development proposals to advance, the interaction between those proposals and the other elements of the Market Renewal will be better understood. The design of any mechanisms developed to enhance flexibility will necessarily need to be aligned with the design changes contemplated under Market Renewal.

Attendee question: How does this consultation fit into the Ontario Planning Outlook process and long term planning activities?

IESO: There is close coordination between the different business units within the IESO to ensure that there is a cohesive narrative that ties together our reliability needs over the horizon of the Ontario Planning Outlook and how market mechanisms can be effective in incentivizing resources to meet those needs.

Attendee question: How do we reconcile short term IESO needs with long term resource investment decision planning need?

IESO: The need for flexibility to manage variable generation variability and forecast uncertainty will continue to be a reliability challenge, particularly with the continued growth in variable generation that is forecasted for the next few years. Where the appropriate value streams for the services needed to maintain reliability can be identified transparently through market signals, this should allow investors to better evaluate how to maximize the revenue opportunities that their facility characteristics can deliver.

Attendee question: Can interconnections between Ontario and its neighbours be utilised further to provide flexibility?

IESO: Greater flexibility to manage forecast uncertainty can be achieved through both domestic resources and neighbouring jurisdictions. Without presupposing the solutions that will be developed through this stakeholder engagement, one such opportunity may be to realize greater flexibility through more frequent scheduling of intertie transactions between Ontario and neighbouring jurisdictions. Currently, such transactions are scheduled on an hourly basis, but a 15-minute scheduling interval for intertie transactions may allow for more balancing transactions to flow within a given hour.