Enabling System Flexibility

August 16, 2016

Meeting Notes

Date held: August 16, 2016	**Time held:** 10am – 12pm	**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:		
Brookfield Renewable Energy Group	St-Onge, Daniel	R
ENGIE	Hiltz, Bonnie	R
Goreway Power Station	Sutherland, Chris	R
Hydrogenics Corp.	Ibrahim, Ahmad	R
Market Surveillance Panel	Shalaby, Amir	R
Next Hydrogen Corporation	Andres, Philipp	R
Next Hydrogen Corporation	Fairlie, Matthew	R
Northland Power	Samant, Sushil	R
Northland Power	Wright, John	R
Ontario Power Generation	Wizniak, Lynn	R
Ontario Society of Professional Engineers (OSPE)	Busheri, Hezek	R
PowerStream	Carr, Daniel	R
Resolute Forest Products	Opaski, Larry	R
Rodan Energy Solutions Inc.	Goddard, Rick	R
Rodan Energy Solutions Inc.	Quassem, Farhad	R
South Cott Ventures	Lampe, Aaron	R
Temporal Power	Biggs, Tim	R
TransCanada Energy Ltd.	Kuntz, Margaret	R
TransCanada Energy Ltd.	Mikkelsen, John	R
Workbench Corp.	Jayapalan, Jennifer	R
Workbench Corp.	Sears, Heather	R
Market Assessment	Hall, Spencer	R
IESO	Agavriloai, Ioan	R
IESO	Drake, Gordon	R
IESO	Ellard, Barb	R
IESO	Hartland, Mark	R
IESO	King, Ryan	R
IESO	Maria, Ahmed	R
IESO	Ng, Hok	R
Registered to participate via teleconferencing		
Atlantic Power Corporation	Forget, Ryan	TC
Brookfield Renewable Power Inc.	Wu, Julien	TC

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Bruce Power	Xu, Jennifer	TC
CanWEA	Giannetta, Brandy	TC
Customized Energy Solutions	Chintapalli, Raj	TC
Electric Power Research Institute	Ela, Erik	TC
FN Power	Ng, Guy	TC
ENGIE North America	Goodhand, Jason	TC
Goreway Power Station	Coulbeck, Rob	TC
Hydro Quebec Energy Marketing	Belanger, Frederic	TC
Ivaco Rolling Mills	Abdelnour, Francois	TC
NextEra Energy Canada	Tuck, Jennifer	TC
Open Access Technology Intl, Inc.	Wallace, Andrew	TC
Resolute Forest Products	Degelman, Cara	TC
Shell Energy	Kerr, Paul	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

This was the second 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 present a timeline of stakeholder engagement, provide feedback to questions received from stakeholders from the first meeting, discuss how flexibility can be enabled in different timeframes, and show how other jurisdictions have found solutions to similar challenges.

2. Stakeholder Engagement and Timelines – Gordon Drake

Gordon Drake presented a timeline on the stakeholder engagement process for the Enabling System Flexibility meetings. The timeline is intended to show stakeholders a roadmap for the remaining SE meetings and how they should expect to participate in that process.

Member Questions and Comments, *with the IESO's response in italics*:

Will improvements to the IESO's centralized forecast approach be considered alongside measures to respond to forecast uncertainty?

The IESO stated that the current forecast accuracy meets the level expected for a "state of the art" centralized forecast, as described in the work of the NERC Integrating Variable Generation Task Force. While the IESO is continually looking at means by which it can improve forecast accuracy, it is unrealistic to expect a perfect forecast. Therefore, we need to develop the mechanisms necessary to incentivize flexible resources to help manage those times in which the forecast of variable generation output deviates from its actual output.

3. Responses to Stakeholder Feedback – Mark Hartland

Mark Hartland provided an overview of the responses to stakeholder feedback received from the first meeting.

Member Questions and Comments, *with the IESO's response in italics*:

Would a demand-side response be considered equivalent to a supply response, provided that it could be achieved in the same timeframe?

Yes, consistent with our desire to develop technology-neutral mechanisms to incentivize flexibility, we can consider these as equivalent.

Is the 1000 MW target for incremental flexible capability sufficient to meet the forecasted flexibility need? Based on the information presented in the first meeting, there will be times when there will be a need over exceeding 1000 MW.

The 1000 MW target was determined in order to meet the flexibility need 95% of the time. In instances where the need for flexibility exceeds the capability brought on by these flexibility mechanisms, then the balance of the time can be managed through additional control actions available to real-time operators.

Has the IESO thought what those mechanisms/control actions might be to meet the need?

One way that we might address this need might be operating reserve. In the first SE meeting, the IESO also identified a number of control actions that might be taken.

What analysis drove the need for a 20-30 minute response time? There will be different timeframes in which the forecast accuracy varies, from 5-minutes out to day-ahead, and so how does the 20-30 minute timeframe align with this improvement in forecast accuracy towards real-time?

The forecast accuracy does not change much until the intra-hour timeframe. Within the hour of dispatch, decisions made during the day-ahead commitment, real-time commitment and intertie scheduling processes are already made. Thus, we are looking for resources that can respond within a dispatch hour and this 20-30 minute timeframe allows for a wider range of technologies to respond.

Has the IESO considered different timeframes of flexibility response? For instance, a premium 5-10 minute response, followed by a slower response time such as 20-30 minutes?

The IESO is looking to incentivize the response of a range of facilities, but there are existing mechanisms to call upon those 5-minute resources through real-time dispatch. This 20-30 minute response fills a gap that isn't currently addressed in our existing scheduling timeframes.

Can it be assumed the forecast error goes both ways and it might under-forecast as well as over-forecast? Would a dispatchable load be valued differently than a generator coming online?

The reliability need becomes evident when we have over-forecasted and resources are needed to increase generation or reduce consumption. There are already mechanisms in place to manage instances of under-forecasting by dispatching down facilities that are online, particularly grid-connected wind and solar generation.

4. Enabling Flexibility – Hok Ng

Hok Ng discussed the market processes in each of the time frames and how flexibility could be addressed in day-ahead through to the five minute interval. The presentation also discussed the approaches taken by other ISOs in North America in order to address similar reliability challenges.

Member Questions and Comments, *with the IESO's response in italics*:

Did the IESO investigate what approaches had been adopted by the Alberta Electric System Operator?

Alberta's installed capacity of variable generation is less than other system operators in the US and thus they were not as useful of a comparator as those other jurisdictions. Their lower installed capacity of variable generation means that they do not face the need for flexible resources to address forecast uncertainty on the same scale as Ontario.

Will environmental attributes be considered in the evaluation of different mechanisms?
The current principles do not explicitly account for environmental attributes. The IESO will consider, going forward, how these attributes will be accounted for when determining proposed solutions.

How does the IESO ensure that the mechanisms developed to address the flexibility need are considered alongside other procurement and market development activities currently underway?

The Market Renewal initiative is the primary forum through which these initiatives are considered holistically. Any solutions developed to address the flexibility need must ultimately be consistent with the

market development activities contemplated in that initiative. These enhancements include changes to our energy pricing and scheduling processes as well as an incremental capacity auction.

How will existing providers of regulation be treated should the IESO procure additional resources following the RFI for regulation?

The IESO currently procures regulation to meet its market rule and reliability standard obligations to balance supply and demand on a second-to-second basis. Any next steps on procuring additional regulation will be communicated through that process.

Will there be additional considerations for technologies that help reduce greenhouse gas emissions?

As noted previously, the IESO will consider how environmental attributes will be accounted for in the evaluation of proposed solutions.

How often will flexible resources be called upon?
We see the need for flexibility become apparent in the intra-hour timeframe. Flexibility will likely be enabled on a daily basis, but the utilization of the resources will depend on actual needs in real-time.

Are there any studies that the IESO has conducted to see where the additional 1000 MW should be located?

Flexible resources will need to be located in parts of the transmission system where their response can be delivered without being unduly restricted by transmission congestion.

More frequent intertie scheduling is an obvious solution. What is currently available in the Ontario system to respond to the need within 20-30 minutes?

There is a diverse generation mix in Ontario, so it may be that we need to better position and schedule the resources we currently have in order to provide this flexibility. In addition to the flexibility that can be made available from existing resources, procurement of incremental flexibility may be necessary. In doing so, the IESO will ensure alignment between the procurement mechanisms necessary to make capability available and effective signals in the real time market required to call upon that capability when needed.

When looking at solutions we should look at selecting those with least cost.

Yes, cost-effectiveness and efficiency are among our principles in selecting a solution.

What is meant by interim measures? What is the timeframe for this?

The IESO has communicated the need for 300 MW of additional flexible capability by the end of 2017, and another 700 MW of capability required by the end of 2018. Enduring market solutions may not be

fully developed in time in order to meet these targets and so other approaches may be needed in the meantime.

5. Next Steps – Gordon Drake

Gordon discussed the layout for the next meeting and the options that we will discuss in more detail:

- Improvements to existing market mechanisms
- New market products
- Other incentives to increase flexibility

The IESO encourages stakeholders to provide feedback in writing and to also consider the following question. What incentives are required to make investment in flexible capability and then provide that flexible response when needed?

Member Questions and Comments, *with the IESO's response in italics*:

Will an RFP be issued this year for the AGC procurement process?
Yes, we are aiming to issue an RFP by the end of the year. At this stage we are trying to understand what the options are, and will refine those based on the results of the RFI we issued earlier this year. We are still considering the amount of regulation that we will need to contract.

Please explain the timeframe for procuring the additional flexibility and what this means.

An additional 1000 MW should be available and available to be called upon in real-time by the end of 2018. Enduring market solutions may not be fully developed in time in order to meet these targets and so other approaches may be needed in the meantime. Those enduring market-based solutions will need to be aligned with the enhancements contemplated under the Market Renewal initiative to ensure we have transparent and efficient price signals that show the value of providing capacity, energy, flexibility and operating reserve in an optimized way.

What level of detail is the IESO seeking in its request for feedback?

We are specifically looking at suggestions related to the means by which we can incentivize both the necessary investment in making flexibility available, as well as how this capability can be efficiently called up on when needed. At this point we are looking at market mechanisms which can be used to incentivise flexible resources and efficiently recover the costs incurred to make this capability available. Solutions proposed should be technology-neutral in order to satisfy our evaluation principles.