

Enabling Flexibility

IESO Response to Stakeholder Feedback – August 16, 2016

The IESO held the second stakeholder meeting for Enabling System Flexibility on August 16, 2016. The IESO invited stakeholders to provide feedback on the materials presented and potential solutions the IESO could consider.

IESO received feedback from the following stakeholders:

Energy Storage Ontario

Hydrogenics Corp

Nipissing First Nation and FN Power

Temporal Power Ltd

IESO responses are in italics.

Stakeholder Engagement Feedback and Responses

Energy Storage Ontario

In looking at the value of flexibility, the IESO should attribute more value according to how quickly a solution can respond since faster response time provides the IESO the ability to adjust almost instantaneously to address forecast issues.

Given that the VG forecast improves significantly within the hour of dispatch, the flexibility need identified is generally in the 30 minute timeframe. Faster response may be required for net demand variations within 5-minute dispatch – this faster response is provided by AGC resources.

A pure technology-neutral approach will not necessarily yield the results consistent with the IESO stated principles nor support broader provincial policy objectives, such as carbon reduction. Ontario's experience demonstrates that technology-specific procurements have provided valuable advancements on the power grid.

The issue of environmental considerations (i.e., carbon neutral or reducing) was raised as a missing consideration. Given Ontario's Climate Action Plan objectives, we don't see how this consideration can be ignored by any sector including the energy sector and initiatives such as this. Moreover, given that the need for more flexibility is driven by the increase in renewables (and need for lower carbon emissions), there should be recognition of solutions that provide flexible resources with low or zero emissions.

At this stage the IESO is taking a technology-neutral approach so that we may consider the flexible characteristics offered by a range of resources.

Regarding environmental considerations, as Energy Storage Ontario has noted, the Ontario Government has implemented a Cap and Trade program to value the costs of emissions. As such, these costs would be considered in any solution.

At Meeting #2, ESO raised the question regarding how the stacking of benefits (as in the case of energy storage which can provide many services), is being considered given that there are separate consultations for flexibility and regulation service, for example. While energy storage can provide value in either of these cases, a key value of energy storage is the economy gained by the capital investment resulting in a facility being able to provide multiple services. Our understanding is the Market Renewal consultation will be considering this issue and is tasked with taking that holistic view.

The IESO recognizes that the activities of this engagement, as well as other initiatives, including Market Renewal are interrelated. As such, we are open to further discussion with stakeholders on this aspect. The goal of Market Renewal is to put in place a platform that would allow participants choice to participate in and receive revenue from multiple market products.

Hydrogenics Corp.

Given that the need for flexibility during the *Within the Hour* period is driven by the challenge of managing an increasing share of variable wind and solar renewable sources in the generation mix, it also makes sense that the criteria to evaluate potential solutions to enable flexibility should also include environmental considerations. A Fuel Cell Power Plant is zero-emission ramping solution.

As indicated in the response above, IESO will be adopting a technology-neutral approach when considering the types of resources that can provide flexibility.

Our understanding of the work that has been done in CAISO on flexibility products is that it started at the same point to identify ramping solutions and market mechanisms to address the situation of shortfalls in variable generation, but was later expanded to include situations where ramping is needed to address surpluses in variable generation. The IESO may wish to include this need in its scope in the future as well.

The IESO has met with other ISOs to better understand their solutions for flexibility and will consider features that may be suited for Ontario's supply mix and market structure.

Nipissing First Nation and FN Power

[The IESO should] examine and determine if VG forecasting can be improved. We would suggest benchmarking the performance of the model used by the IESO to [those used in] other jurisdictions and backward test the models to determine if improvements can be made.

The IESO is currently pursuing some forecast improvements. Incremental improvements may result from these efforts, but the overall magnitude of flexibility needed does not change. The forecast service is currently performing consistent with other jurisdictions in North America.

It appears that part of the answer must be increasing frequency of intertie scheduling as it provides another tool to meet VG forecasting error and if the frequency increases it provides more flexibility/options for the IESO to deal with VG forecasting errors while meeting the principles desired by the IESO. We recommend the IESO to examine how much power was being exported via the intertie during periods of forecasting errors where insufficient generation occurred.

Increased intertie scheduling is a solution and is currently being contemplated by the IESO.

Another consideration is that the IESO should examine the cost of curtailing VG assets. We understand that the PPA for some of the VG assets has limits in term of ability to curtail production. We recommend that the IESO identify how much curtailment it utilizes annually and how much space is left before the limit is hit. This would better inform the IESO of the amount of resources [they] should commit to in order to deal with VG forecasting error. Procure additional generation to deal with Acceptable VG Forecasting Error with characteristics similar to that of Regulated Reserves (with AGC).

For under-forecasting of VG, VG resources may be dispatched lower levels. However, the IESO is concerned about the need for flexibility to compensate for VG over-forecasts.

Regarding commitment of resources, the impact of forecast errors differs depending on the decision being made using the forecast. Errors in the generation and intertie transaction commitment timeframes, usually done several hours ahead of real-time for generation and in the hour-ahead time frame for transactions, affect the system's ability to meet demand. This exercise is more discrete in nature, as commitments are made to meet a single demand figure representing an hour. For this, we will be targeting flexible resources to compensate.

The error in the dispatch algorithm introduced by the 5 minute variable generation forecast is generally compensated by AGC. In the 5 minute real-time dispatch timeframe, the forecast error is significantly smaller but large enough to impact AGC. The need for additional AGC is currently being evaluated by the IESO in preparation for the RFP for regulation service.

Temporal Power

The Response Rate and the Signal Mileage the energy storage system travels are important market conditions that must be identified during the development of the IESO's System Flexibility needs and principles.

The IESO will present the characteristics of flexible resources in the stakeholder engagement.