

April 28, 2020

IESO Stakeholder Engagement:
Energy Storage Advisory Group
Market Renewal Program

Re: OPG Comments – Energy Storage Design Project; March 26th 2020 Webinar

Ontario Power Generation (OPG) appreciates the opportunity to provide feedback on the recent Energy Storage Working Group (ESAG) webinar, which was presented by the IESO on March 26, 2020.

Inclusion of Energy Storage Resources (ESRs) in Market Renewal (MR)

OPG fully supports that Energy Storage Resources (ESRs) should be able to compete on a level playing field with other supply sources in the IESO Administered Market (IAM) today and in the future. ESRs should be recognized in the Market Renewal Program (MRP) design and use design elements from both hydroelectric resource dispatch data parameters and the pseudo unit model.

This includes full participation in all markets including ancillary products and services along with the supply of more than one product if the facility has the capability - similar to existing treatment for generators.

State of Charge (SoC) Management

OPG believes it is important to allow participants with ESRs to select the State of Charge (SoC) Management approach that fits the needs of their specific resource. Different technologies may require different types of support to participate in the market. This could be self-management or IESO-management and the option could be established as part of registration.

Stand alone pump storage hydro and battery storage facilities may prefer to have the IESO optimize their resources both in the real-time market and the existing day-ahead commitment process (or in the future day-ahead market post market renewal). From an overall IAM perspective, the IESO is in the best position to schedule ESRs for the system's benefit given their view of the system, knowledge of the offer stack and system optimization requirements. However, market participants should still have a choice as they need to assess:

- the internal resources, costs and risks to offer into the market and schedule the facility;
- the products and services the ESR wants to provide;
- the proportion of the ESR capacity offered for each of these product(s) as each one will most likely be valued at different price points; and
- the performance and compliance obligations be it for the market or other procurement mechanism.

Pump storage facilities which are coupled with downstream hydroelectric stations are more complex. In order to coordinate and optimize the benefits from these hydroelectric resources, the linkages and inter-temporal dependencies between these facilities must be properly managed. The ESR must be able to optimize its own

SoC using design elements from both energy storage design and the hydroelectric dispatch design proposed as part of the MRP. SoC management by the IESO would not yield an effective solution.

As part of the design, the IESO should also consider allowing participants to change their SoC management options daily and within the day from the day-ahead to real-time market. This will enable ESRs to reduce risk or potentially increase flexibility to maximize system reliability, market efficiency and revenues. Benefits in providing the option to change the SoC management approach more frequently should be explored, however it adds an additional level of complexity for the IESO's dispatch scheduling optimization engine.

Further as part of SoC management, a mechanism needs to be in place to value and represent the different price laminations or opportunity costs associated with different levels of storage. This could be represented by Daily Energy Limits (DEL) at different offered prices as described in the MRP High Level Design (HLD). This field would be used to offer storage at different opportunity costs and prevent a resource from being over-scheduled in the day-ahead at an offer price that is not reflective of the opportunity cost of the resource.

IAM Registration and Optimization Models from Other Jurisdictions

The IESO's vendor RFP for MRP includes enhancements for energy storage that are similar to the interim solution the IESO proposed as part of ESAG. Of these, the most controversial is the requirement to register as two separate resources (generation and load) instead of creating a new resource category for energy storage that treats load as negative generation. Registering as two separate resources requires an additional parameter to link both the generation and load sides for optimization.

In lieu of the above proposal, the IESO should examine current optimization models already utilized in other markets. OPG would highly recommend the IESO revisit and review the optionality of negative bids for ESRs to assist in managing resources, particularly in the case of pump storage hydro facilities. This design is being reviewed and may already be implemented for NYISO as well as CAISO.

NYISO¹ facilities bid as a negative generator for intervals in load consumption or pump mode. This is similar to bidding as a price capped load as the resource pays the market clearing price but does not incur certain costs that are only allocated to loads. The facility offers as a generator in intervals when the resource desires to supply energy. When an ESR can be both a load or inject energy into the Grid, the ESR structures its offer to have a negative value for its maximum charge limit and a positive value for its minimum discharge limit.

In CAISO², "Non-Generator Resources (NGRs) are Resources that operate as either Generation or Load and that can be dispatched to any operating level within their entire capacity range but are also constrained by a MWh limit to (1) generate Energy, (2) curtail the consumption of Energy in the case of demand response, or (3) consume Energy." They have a continuous operating range from negative to a positive, function as a generation resource and provide both energy and ancillary services.

1

https://nyisoviewer.etariff.biz/ViewerDocLibrary/Filing/Filing1470/Attachments/20190501_NYISO_Rspns_ESR_Qstns.pdf, May 2019 NYISO compliance filing for FERC 841

² <https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Operations> page 42-43

If something similar could be incorporated into the IAM for ESRs, it would provide a technically straightforward option for these resources. It is important in any model that the IESO selects that the resource does not receive conflicting day-ahead financially binding schedules for both generation and load in the same hour.

Incorporating SoC into Multi-Interval Optimization (MIO)

The application of SoC into MIO should be assessed. Issues include the incorporation of variable ramp rates at different SoC levels, however there are benefits to the system from ESR participation in MIO.

Market Clearing Price/Ancillary Markets

In other markets ESRs set market clearing prices and should in Ontario as well. OPG believes there should be an effective way for the IESO to optimize energy, operating reserve and AGC, and this should apply to all generators and ESRs.

ESR's and Uplift Charges

In regards to uplift charges the IESO should consider following the same practises in place for generators - if ancillary services are provided the ESRs should not be charged. FERC 841 supported removing all charges if ESRs are providing ancillary services which would include Network Service Charges (NSC). The removal of transmission charges, set at the OEB, should also be pursued.

Summary

Design features of the IESO's Energy Storage Design Project need to be closely aligned with the design features of MRP to capitalize on efficiencies and minimize the need for design re-work. Barriers for ESRs to participate in the IAM need to be alleviated today and post-MRP.

We look forward to working with the IESO on the various SoC management options, and assisting with the integration of both projects to achieve the best outcome for market participants and the IAM.

Regards,

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