Energy Storage Design Project – Feedback Form

February 18, 2020

Date Submitted: *2020/03/02*	**Feedback Provided By:** Company Name: TC Energy Contact Name: Charles Conrad Contact Email: [redacted]

Following the February 18, 2020 Energy Storage Advisory Group (ESAG) meeting to discuss the Energy Storage Design Project, the IESO is seeking feedback from participants on whether the Interim Design Features presented within the design document offer pragmatic solutions for the participation of energy storage in IESO Administered Markets in the near term. The IESO will work to consider feedback and incorporate comments as appropriate and post responses on the engagement webpage.

The referenced presentation and design document can be found under the February 18, 2020 entry on the ESAG webpage.

Please provide feedback by March 3, 2020 to engagement@ieso.ca. Please use subject: *Feedback: Energy Storage Design Project*. To promote transparency, this feedback will be posted on the ESAG webpage unless otherwise requested by the sender.

Thank you for your time.

Topic	Feedback
Design Feature Self-Scheduling 1 – Maintain current capacity limit of 10 MW for- Self-scheduling energy storage resources in the real-time energy market	• The market renewal program (MRP) design principles are: Efficiency, competition, implementability, certainty, & transparency • Energy storage resources by their nature are dispatchable resources that can quickly respond to market signals. In short, ESRs are a market utilization tool that increases the efficiency of the Ontario wholesale market. Put another way, ESRs are logically expected to be a margin resource within the IESO-Administered Market (IAM) that are motivated by market signals • The rationale in the IESO Storage Design Project (SDP) for self-scheduling 1 design feature states that ESRs are "an inherently controllable facility and should be encouraged to be dispatchable". • The principles of MRP clearly state that ESRs should not be self-scheduling: o Competition: more dispatchable resources submitting bids & offers into the IAM increases competition o Certainty: bids and offers from ESRs provide greater certainty of consumption & injection expectations in the IAM and help the IESO meet supply/demand balance needs o Transparency: ESRs registered as dispatchable resources offer clear visiability to the IESO and other market participants on the impact of ESRs on the IAM o Efficiency: direct market participation from ESRs increases the efficiency of market scheduling/dispatching/pricing/settlement

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	compared to the IESO guessing what self-scheduled resources will do with respect to market price signals and supplier economics. • In short, there is very little reason why the IESO should not lower the self-scheduling limit for energy storage resources from 10 MW to 1 MW (the minimum participation capacity in the IAM).
Design Feature Self-Scheduling 2 – Raise current capacity limit of 10 MW for Self-scheduling energy storage resources providing regulation service only	• The IESO has stated that the Automatic Generation Control (AGC) tool cannot appropriately integrate ESRs for regulation service. Therefore the ESRs must be self-scheduling to be able to offer regulation service in the IAM • TCE is supportive of the self-schedule capacity limit being raised for regulation service, but strongly recommends that upgrades to the AGC tool be prioritized. Our understanding is that many of the AGC tool upgrades can be completed outside of the tool upgrade scope under the MRP. • Once the AGC tool has been upgraded it is reasonable that all energy storage facilities should become dispatchable
Design Feature Facility Registration 1 – Registration of self-scheduling energy storage facilities providing regulation service only	• Given that the approach is the only feasible arrangement that works with the existing IESO tools, TCE is in agreement with the registration process for ESRs providing regulation service, but only as an interim measure
Design Feature Facility Registration 2 – Registration of self-scheduling energy storage facilities in the real-time energy market	• In line with the comment on Design Feature Self-Scheduling 1, TCE firmly believes that all ESRs greater than 1 MW should be dispatchable energy storage facilities

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Design Feature Facility Registration 3 – Registration of dispatchable energy storage facilities	• TCE is supportive of the proposed dispatchable energy storage facility registration features and believes it should be extended to all energy storage resources greater than 1 MW
Design Feature Prudential Security 1 – Prudential Support Obligation for market participants with energy storage facilities.	• TCE believes the design feature put forward by the IESO for prudential support obligations for market participants with energy storage facilities is reasonable and aligns with the other market participants
Design Feature Day Ahead Commitment Process 1 – DACP data submission requirements for each class of interim energy storage participation	• Aligning energy storage facility participation in the DACP with other dispatchable and self-scheduling market participants is logical and supported by TCE. • The IESO notes in their rationale (Section 2.6.8 point 2) that the DACP is expected to evolve to a Day-Ahead Market (DAM) as part of the MRP. At this time, the IESO has not been clear about how energy storage resources and their unique attributes will participate in the DAM. Therefore, TCE recommends that in addition to this design feature the IESO clearly articulates how the DAM design will integrate energy storage resources.
Design Feature Day Ahead Commitment Process 2 – No overlap rule for bids and offers into the DACP for energy storage facilities	• Given the restrictions of the DSO tool and the requirement that energy storage facilities be modelled as separate load & generation facilities, it is reasonable to restrict overlapping for bid/offer prices in the DACP.
Design feature State of Charge 1 – Restriction against overlapping or equal bid/offer prices	• Given the restrictions of the DSO tool and the requirement that energy storage facilities be modelled as separate load & generation facilities, it is reasonable to restrict overlapping for bid/offer prices

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Design feature State of Charge 2 – Addressing potential changes to SoC-limited bids and offers	• The design feature aligns with the current approach and justified reasoning for allowing adjustments to offers/bids within the mandatory window, therefore TCE supports the design feature.
Design Feature Operating Reserve 1 – no simultaneous offers of operating reserve from the two resources comprising a dispatchable energy storage facility	• Generally support the design feature given the limitations of the IESO tools • That being said, an energy storage facility with sufficient state of charge should be able to offer OR for the available net capacity from current consumption to max generation. For example, consider a 10 MW storage facility with sufficient state of charge. If the storage facility is scheduled to consume 10 MWh (i.e., 10 MW over 1 hour), the storage facility should also be able to offer 20 MWh of OR since the energy storage facility could receive and respond to an OR schedule that requests 10 MWh of injection (i.e., reduce consumption by 10 MW and ramp up to injection of 10 MW). Similarly, the same energy storage facility injecting at 3 MWh could offer 7 MWh of OR since output could be increased to 10 MWh (i.e., similar to a gas-fired generation facility operating at half-load). In short, the IESO should consider how to allow energy storage resources to offer the net consumption-to-max generation capacity as an OR product and not restrict simultaneous offers that are logical and dispatchable.
Design Feature Operating Reserve 2 – Operating reserve requirements specific to a dispatchable load resource comprising a dispatchable energy storage facility	• Reasonable and supported design feature

Topic	Feedback
Design Feature Operating Reserve 3 – Operating reserve requirements specific to a dispatchable generator resource comprising a dispatchable energy storage facility	• Reasonable and supported design feature

General Comments/Feedback:

- The design features listed in the SDP are generally reasonable and logical; however, it is not clear how these design feature decisions link to longer-term design changes in Stage 2 and 3 of the SDP. For example, many design feature decisions are determined based on restrictions with the existing tools. How is the IESO intending to identify temporary design feature changes compared to long-term term implementation? It would be helpful if the IESO described in more detail the plan for how the evolution of the SDP is expected to link to longer-term decisions. A key concern is that temporary decisions made because of existing tool restrictions become long-term design foundations instead of considering broader solutions that are not restricted by existing tool capabilities.
- It is clear that the capabilities of the existing IESO tools is the primary barrier to market design changes required to properly integrate energy storage resources. The IESO has alluded to potential investments to upgrade the tools, but has failed to discuss the criteria for making those decisions. For example, what is the cost-benefit analysis to determine if a tool should be upgraded? In addition, the IESO has mentioned resource constraints due to the many activities underway. How will the IESO determine when additional resources are required? These decisions should not be completed solely by the IESO but should include all market participants who are the ultimate users of the market.
- One primary concern with the SDP is the lack of clarity and transparency on how the SDP links to other IESO initiatives (i.e., MRP, innovation white papers series, capacity auction market rule development). There are two key components to this concern. First, the IESO should be clear on which stakeholder engagements have the priority in addressing issues. For example, should energy storage market rule changes for the capacity auction be addressed in the SDP or in the capacity auction stakeholder engagment? Second, there are market design decisions being

considered that link to the design feature discussion underway in the SDP. It is not clear how the IESO is incorporating those design features into other activities, specifically detailed design decisions within the MRP. For example, the SDP discusses how the DACP will evolve into a DAM. However, the IESO is not clear how SDP design features will be incorporated in to DAM design decisions. If the changes are not incorporated appropriately much of the progress accomplished throught the SDP will be lost or halted. The IESO should start providing clear linkages to other consultations and initiatives so that stakeholders (and the IESO) understand how the overall market will evolve.

- Not all of energy storage issues fit neatly within the IESO mandate; in fact, many many of the issues straddle the mandates of the IESO and OEB. Coordination is required between different government agencies to address many of the regulatory barriers identified for energy storage resources. It is recommended that the two entities (i.e., IESO and OEB) determine how to convene a joint engagement session to prioritize and begin addressing the issues that are not solely the responsibility of a single agency. For example, transmission tariff design for system resources offering essentially reliability services should be discussed and cost-benefit analyses completed.