Stakeholder Feedback and IESO Response

Energy Storage Design Project – June 24th, 2020

Following the June 24th public webinar on the Energy Storage Design Project, the Independent Electricity System Operator (IESO) received feedback from participants on the draft redlined Market Rules and Manuals and the recommended approach to uplift charges.

The IESO received feedback from:

- Capital Power
- Electricity Distributors Association
- EDF Renewables Canada
- Energy Storage Canada
- Fasken on behalf of H2GO Canada
- Hydro One
- Market Surveillance Panel (MSP)
- Ontario Power Generation
- Power Workers' Union
- TC Energy

This feedback has been posted on the Energy Storage Advisory Group webpage.

Note on Feedback Summary

The IESO appreciates the feedback received from stakeholders. The feedback has been noted and will be considered as the engagement moves forward. The IESO has provided a summary table below, which outlines specific feedback or questions for which an IESO response was required at this time.

Stakeholder comments and IESO responses on draft Market Rules and Manual changes

Section Reference

Chapter 5, Section 4.5.1.3

Stakeholder Comments

Is there a requirement for a separate designation to provide 10 minute synchronized OR for PGS if there are new definitions for "energy storage" as outlined in Chapter 11?

IESO Response

The IESO continues to consider the appropriate application of the interim storage design to the Beck PGS facility. As such, the IESO believes it is appropriate to maintain the clause at this time.

Section Reference

Chapter 5, Section 4.5.13B

Stakeholder Comments

Energy Storage Canada acknowledges the inclusion of the ability for energy storage to provide 10-minute synchronized reserve.

IESO Response

Thank you for your acknowledgement.

Section Reference

Chapter 5, Section 7.1.6

Stakeholder Comments

Consider re-wording this requirement

IESO Response

The language has been revised as follows:

If required by the IESO for the purpose of enabling the IESO to produce the forecasts referred to in section 7.1.1, each electricity storage participant shall provide to the IESO the load forecasts described in the applicable market manual in such form, at such time and having such resolution as may be specified in such market manual."

Section Reference

Chapter 5, Section 8.1.1

Stakeholder Comments

As currently worded, it may not make sense to reference the actions itemized in 8.1.1 as being applicable to storage facilities as they don't all apply. The IESO may want to consider listing the control action(s) that could be initiated by an SPS (Special Protection System) to a storage facility.

IESO Response

The capabilities of storage technologies are evolving and as such while some of the itemized actions may not pertain in today's environment, the IESO does not want to limit through the rules what might be enabled in the future. As such, we have used this clause to be clear that the control actions may apply, or may not. The language will be revised to include, "if and as applicable", to support this meaning.

Section Reference

Chapter 5, Section 8.4

Stakeholder Comments

Energy storage facilities will participate as quick start therefore ESC is not sure they should be included in this section.

IESO Response

The IESO appreciates that one of the main benefits of certain storage technologies is their ability for near instantaneous response to market signals. However, we also understand that the storage marketplace is evolving, with many new storage technologies emerging. For this reason, to facilitate the participation of all storage resources on a level playing field with generation, we include the potential of technologies that may take longer to adjust their output.

Section Reference

Chapter 7, Section 2.2.9A

Stakeholder Comments

Two stakeholders commented that the rules should not allow for self-scheduling of energy storage resources for any other reason than to provide regulation service.

IESO Response

As communicated previously, the proposed registration models will provide storage facilities with opportunities for participating in the IESO-administered markets that are equivalent to the existing treatment of generators. The IESO believes this approach to be both prudent and fair, as there is no pressing need to commit to eliminating the concept of a self-scheduling storage facility at this time

and the approach maintains the same long standing options and flexibility that are currently afforded to generators.

The IESO notes that in the future it may be appropriate to revisit thresholds for self-scheduling resources more broadly to ensure that the reliable operation of the grid is not being adversely impacted.

Section Reference

Chapter 7, Section 8.4A

Stakeholder Comments

Compensation/cost for an electricity storage facility cycling daily should be based on the administered prices not historic average offers/bids. A resource consuming and returning the energy to the market to capture opportunity on a daily basis is not the same as a generator with external fuel costs or loads producing products for external consumption.

IESO Response

Compensation is based on the differential between the administered price and the offer price (see 8.4A.9.3) when the price offered was higher than the administered price, so the administered price is a key element in this determination. Where historical bids and offers come into consideration is in Sections 8.4A.9.b and 8.4A.9c. when the market has been suspended and there are no bids or offers to base 8.4A.9.3 and 8.4A.9.4 on.

Section Reference

Chapter 7, Section 8.4A.9B and C

Stakeholder Comments

The use of average historical offers and bids does represent the day to day participation of energy storage facilities. However, a storage facility that cycles daily would have costs and opportunity based on the current day prices not historic prices.

IESO Response

The IESO agrees with this comment. Note though, that this clause is only pertinent in the extremely rare event of a suspension of the energy market, such that there are no bids or offers available to allow for the determination referred to in 8.4A.9.3 and 8.4A.9.4. Both Market Participants and the IESO benefit from having some guidelines in how to proceed if such a rare event occurs.

Section Reference

Chapter 7, Section 21.3

Stakeholder Comments

Energy storage providing regulation is permitted to be registered up to 50 MW as a self-scheduling resource. What happens if the facility is not selected for regulation service on a specific day can it still provide energy up to 50MW as a self scheduling generator/load?

IESO Response

Currently, tool limitations restrict an electricity storage facility registered to provide regulation service to providing this service solely in accordance with section 21.2.3. Therefore, a storage facility registered to provide regulation service cannot participate in the energy market at times when it is not providing regulation service. To further clarify this point, we have also revised section 21.3.3 to read: "An electricity storage facility that is registered to provide regulation services may not participate in the energy market or the operating reserve market."

Section Reference

Chapter 11

Stakeholder Comments

The definition of 'electricity storage capacity' means the maximum power that an electricity storage unit or electricity storage facility can supply, usually expressed in megawatts (MWs). There should be an equivalent definition that relates to the charging of the unit/facility. This may be at a different rate then the supply rate and facilities might prefer a slower charge rate for degradation reasons.

IESO Response

We appreciate that there may be differentials between the injection and withdraw rates for specific storage technologies, and have reflected this in our definitions related to the size of the electricity storage resource. The definition electricity storage capacity is used primarily in chapters 5 and 7, specifically in sections that deal with system adequacy. From this perspective, the emphasis is on how much energy the resource may be able to inject if required. If a future need arises to have an equivalent definition on the withdraw side, one will be created.

Section Reference

Chapter 11 - Aggregated electricity storage facility size

Stakeholder Comments

Aggregated electricity storage facility size is determined by the sum of all maximum injection capabilities. TC Energy believes this definition is for an energy storage facility located at the same connection point and not for an aggregation of energy storage facilities located at multiple connection points. The IESO should confirm aggregated energy storage facilities are for the same physical connection point and general location.

IESO Response

The use of this term was for Appendix 2.2 and sections of Chapter 4 which broadly are meant to determine communications and monitoring requirements for the Market Participant. The use of the term was meant to refer to multiple connection points consistent with treatment for generators today. Upon further review and to eliminate the potential for confusion, the IESO no longer believes that the defined term is necessary, and instead has slightly modified the defined terms electricity storage facility size and electricity storage unit size. To support these changes, we have also edited sections 1.12 and 1.13 of Appendix 2.2 and section 7.3A.1.2 of chapter 4.

Section Reference

Chapter 11

Definitions for:
(a) aggregated electricity storage facility size
(b) aggregated electricity storage unit size

Stakeholder Comments

Since storage facilities aren't 100% efficient, isn't it always the case that the withdrawal limit will define the maximum injection output, such that the maximum injection limit will always be less than or equal to the withdrawal limit. Therefore, should the size of a storage facility or unit not simply be based on the withdrawal limit?

IESO Response

It is true that the total amount of energy (MWhs) injected by an electricity storage facility will always be less than what is withdrawn. The size of a facility, however, is based on the rate (MWs) at which energy can be withdrawn and injected. This approach is consistent with the approach of measuring the size of both loads and generation in the market rules today. The proposed definitions allow for the possibility that the rate at which a facility can withdraw power may be greater or lesser than the rate at which it can re-inject that power.

Section Reference

Appendix 2.2, Section 1.1.1.2

Stakeholder Comments

Typo- should this section refer to "embedded electricity storage facilities" not "electricity storage participant"?

IESO Response

The definition of an electricity storage participant refers to the owner or operator of an electricity storage facility. When referring to obligations, the structure of the market rules is to attach these to the owner/operator, rather than to the facility. So in this case, the use of electricity storage participant, Market Participant is intentional.

Section Reference

Appendix 2.2, Section 1.1.12

Stakeholder Comments

The section states "c. the aggregated electricity storage facility size is 100 MVA or greater".

This is one of the criteria of being designated a 'major electricity storage facility', therefore this criteria may be redundant.

IESO Response

The intent of this section was to mirror what is stated for generation under section 1.1.1.1. Upon further review, the IESO agrees that the proposed language did not capture the proposed intent and we have rephrased it as "the aggregate of the electricity storage facility sizes of the applicable electricity storage facilities is 100 MVA or greater." Note as well that the definition of a major electricity storage facility refers to the aggregation of electricity storage units, and not facilities.

Section Reference

Appendix 2.2, Section 1.5.1A & 1.5.2A

Chapter 4, Section 7.8.2A & 7.8.2B

Stakeholder Comments

Will the IESO provide detailed justification to Electricity Storage Participants for re-classification of their facility?

IESO Response

The rights to reclassify facilities currently exist with generation and load (see section 1.5.1 of Appendix 2.2), and these clauses extend similar rights to electricity storage facilities. The IESO typically provides notice and rationale when this right is exercised.

Section Reference

Appendix 4.2

Stakeholder Comments

In reading the proposed revisions to Appendix 4.2, the performance requirements apply to generation facilities connected to the IESO-controlled grid whereas the performance requirements apply to storage units connected to the "electricity system". Can the IESO clarify what is meant by this distinction and what additional storage units could be captured by the reference to the "electricity system"?

The applicability section of the table in Appendix 4.2 should be updated to reference the applicable storage facilities as it currently only references generation facilities.

IESO Response

There was no intentional distinction between the use of the two terms. The performance requirements project (which is focused on changes to Appendices 4.2 ad 4.3) and SDP are progressing concurrently and a different approach was used for each initiative. Moving forward, the rules developed for the storage project will be updated to use "IESO controlled-grid" rather than "electricity system" in order to maintain a consistent approach. If approved, the proposed changes to performance requirements being developed through market rule amendment MR-00445 will apply to all facilities, including electricity storage resources.

Section Reference

MM 1.5, Section 3.11.4

Stakeholder Comments

The restriction to energy for 130 minutes should be reviewed and reduced to improve market efficiency while maintaining grid reliability. The ability to remove OR offers within the mandatory window based on storage capability would provide incremental OR capacity to the market.

IESO Response

The 130-minute requirement represents a fundamental design element of the Storage Design Project. As operating reserve is a reliability product, where NPCC requires that participants are able to provide and sustain operating reserve for at least one hour, the 130-minute requirement ensures that storage resources will have sufficient duration of service to meet this requirement in a given dispatch hour.

Section Reference

MM 5.5, Section 1.6.32

Stakeholder Comments

Energy storage flexibility and high ramp rates make this section unnecessary

IESO Response

As noted above, the IESO appreciates that one of the main benefits of certain storage technologies is their ability for near instantaneous response to market signals. However, we also understand that the energy storage marketplace is evolving, with many new storage technologies emerging. For this reason, to facilitate the participation of all storage resources on a level playing field with generation, we include the potential of technologies that may not be as flexible.

Section Reference

MM 7.1, Section 11.2 and 11.3, Section 4.2.4

Stakeholder Comments

Seeking clarification on the communication requirements. Electricity storage registered as quick start will have to call prior to synchronization and de-synchronization but not provide the two-hour and one-hour notification?

IESO Response

The communication protocol will be the same as it is for generators. Specifically, as per MM 7.1, if electricity storage is designated as quick start (able to synchronize and follow dispatch instructions within five minutes), it is not required to notify the IESO before synchronizing their unit but is required to notify the IESO five-minutes prior to de-synchronizing. If it is not designated as quick start (i.e. unable to synchronize and follow dispatch instructions within five minutes) then storage must notify the IESO 2 hours in advance of synchronization and one hour prior to desynchronization.

Section Reference

MM 7.8, Section 2.2.6

Stakeholder Comments

Section 2.2.6 describes the criteria for energy storage facilities to be restoration participants. The size requirements are determined based on being "electrically south of Barrie". This definition is used for generation facilities; however, the definition is ambiguous since flows into Barrie do not recognize definitions. Further, Barrie is not a major network node and it is unclear if the IESO means Barrie TS or the city of Barrie. TC Energy recommends that either the IESO zones (i.e., the 10 internal transfer zones) or a major network interface be used instead.

IESO Response

The IESO acknowledges that the proposed language may lead to confusion. The intended meaning is "electrically north/south of Essa TS in Barrie". This will be updated when the Market Manuals undergo the Baseline process for the storage amendments.

Section Reference

N/A

Stakeholder Comments

Replace references to "electricity" with "energy"
We note the reference to "electricity" in all new terms added to describe the type of resource to be stored. For example, the following terms are used throughout the Proposed Amendments: "electricity storage participant"; "electricity storage facilities"; "electricity storage facility", "electricity storage unit" and "electricity storage". We note that new resources may be encouraged to enhance and secure the operating reserve, further to the EPOR-E initiative, that do not exist in the form of

electricity when stored, but instead in a gaseous state (e.g. hydrogen).

In order to promote the participation of all resources, to keep pace with energy transitions observable in several international jurisdictions, we suggest broadening these terms, replacing the reference to "electricity" with "energy" throughout the proposed amendments so the new terms are referred to as "energy storage participant"; "energy storage facilities"; "energy storage facility", "energy storage unit" and "energy storage".

Add reference to two classes of "energy storage participants", one which returns electricity to the grid and one which does not
Reference is made to the addition of "electricity storage participants" (which we suggest be referred to as "energy storage participants", in line with our first comment above). We note the Proposed Amendments contemplate the participation of energy resources which withdraw electricity from the grid and then inject it back. We suggest these types of resources could be identified with reference to a particular class (e.g. "Class 1 Storage Participants").

The Proposed Amendments make no reference to a separate type of energy resource which withdraws electricity from the grid but does not inject it back, instead using it for an alternate use, which offers the potential of offsetting future load (e.g. "Class 2 Storage Participants"). We note that recognizing this class of participant would be consistent with the past work conducted by IESO, as described in the "IESO Report: Energy Storage", dated March 2016. In this report
IESO acknowledged this class of energy storage technology, referring to it as "Type 3".

To maximum the participation of a diversity of proven energy resources and in an effort to optimize the operating reserve, we suggest adding reference to a class of participant that is permitted and able to participate on such basis.

IESO Response

The use of the term "electricity" was chosen to reflect the scope of the SDP and to support the definition of a storage facility as a facility that has the sole purpose of withdrawing electricity from the electricity system, storing that electricity as energy, and re-injecting it, or a portion thereof, as electricity into the electricity system. The term is meant to be technology agnostic in that it is indifferent to the form in which the electricity is stored, be it chemical, potential, kinetic, etc., so long as it is re-injected into the grid in the form of electricity. This approach is consistent with the definition for storage used by the province in Ontario Regulation 429/04.

The scope of the SDP is focused on storage facilities that are developed for the sole purpose of providing grid services. While other commercial opportunities may exist for storage technologies that withdraw electricity from the grid, these are beyond the scope of what is being designed for in this project.

Section Reference

MM, Multiple sections

Stakeholder Comments

Add reference to performance requirements and conceptual drawings that provide for a diversity of participation by energy resources, not just batteries
Reference is made to the performance requirements referred to in the proposed language added to Market Manual 1: Connecting to Ontario's Power System, Part 1.4: Connection Assessment and Approval, in the referenced Appendix 4.2 and 4.3.

With respect to facilities that inject, withdraw or can both inject and withdraw electrical energy and how they are to be assessed for compliance with the applicable performance requirements, consider including a set of performance requirements that are tailored to contemplate the connection and participation of a hydrogen storage facility.

Reference is also made to the diagrams included in Market Manual 3: Metering, Part 3.6 Conceptual Drawing Review, specifically the new diagram proposed in Appendix B as B.4 entitled Electricity Storage (which we suggest be referred to as "Energy Storage", in line with our first comment above). We note the reference in the illustration to a "stationary battery". We suggest adding an additional illustration to B.4 which also depicts the conceptual design of a
hydrogen storage facility.

IESO Response

The conceptual drawings provided in MM 3.6 Appendix B are illustrative examples. The design of the market rules and manuals to implement the interim design of the SDP are meant to be technology agnostic and do not pertain to any particular type of energy storage. Provided the facility has the sole purpose of withdrawing electricity from the electricity system, storing that electricity and re-injecting it, or a portion thereof, as electricity into the electricity system, then it would be considered an electricity storage facility.

Stakeholder comments and IESO responses on uplift proposals and other feedback

Topic

Support for the uplift proposal: Storage should be exempt from uplift charges on 'fuel'

Feedback

A number of stakeholders provided support for the uplift proposal, with the following pieces of feedback:

- TC Energy supports the proposal that energy storage should be exempt from uplift charges. As described by the IESO, energy storage facilities act as an intermediary in the electricity system and are not end-use customers. Applying uplift charges to energy storage increases their costs, which are passed on to end-use customers.
- EDF supports the proposed exemption from uplift charges for energy storage resources. EDF agrees that energy storage resources are not end-use customers and therefore are intermediaries in the Ontario electricity system.
- In general, Hydro One agrees with the approach proposed by the IESO to exempt storage from uplift charges if the facility withdraws energy from the grid as "fuel" for the sole purpose of injecting power back into the grid to provide grid ancillary services.
- OPG agrees with the proposed methodology that ESRs should be exempt from uplift charges on 'fuel'. Also any other withdrawals for other commercial purposes (e.g. commercial use, office lighting etc…) should continue to be subject to uplift under the jurisdiction of the Market Rules.
- ESC supports the proposed exemption of uplift charges for storage facilities. The application of a "fuel tax" would produce incremental costs that would be borne by all consumers with no value or efficiency gain. The EDA supports the proposed approach; it addresses the concerns raised by energy storage providers as summarized by the IESO in its report "Removing Obstacles for Storage Resources in Ontario". The EDA agrees that the exemption should only apply to energy withdrawn for the sole purpose of providing services back to the grid.

IESO Response

The IESO thanks stakeholders for their feedback and overall support for the uplift proposal, which exempts electricity storage resources (ESRs) from uplift charges - within the IESO's purview - on energy withdrawn as fuel.

Topic

Additional information on uplift proposal

Feedback

Some stakeholders requested additional information to support the proposal:

- One stakeholder recommended the IESO perform a rigorously constructed, cost-benefit analysis of the impact(s) for consumers arising from exempting storage from uplift charges, noting that specific attention should be paid to three cost elements: the potential for ESRs to increase uplift charges on other loads; the technical costs implications of distinguishing ESRs from non-exempt loads; and, the potential impacts of uplift charge exemptions on the market clearing price.
- One stakeholder indicated that decisions regarding the application of uplift charges should be supported by the principles of cost causation, and recommended the IESO conduct this analysis to help demonstrate that design decisions do not result in an increase in system-wide uplift costs. The stakeholder further noted that if such analysis is not possible, the IESO should indicate why it cannot be undertaken.
- One stakeholder questioned whether the treatment would be fair relative to other resources (e.g. station service), and would appreciate further information on the analysis undertaken in support of this design decision.

IESO Response

As the IESO explored uplift treatment for ESRs, it was important to first understand the unique role of storage in wholesale electricity markets. It is the IESO's view that storage is not the end-use consumer, rather its withdrawals are made to provide future services to the wholesale grid. This interpretation of storage as a service provider, as apposed to an end-use consumer, is consistent with all other US jurisdictions reviewed, and was a key driver for exploring a unique treatment for the application of uplift charges to ESRs.

The IESO considered cost impacts to end-use loads and the market as a whole, and found that the dynamic implications of exempting storage from uplift costs on their 'fuel' would result in more efficient market outcomes (and vice versa). The example provided at the June engagement meeting was meant to be illustrative of a principle not definitive of a specific outcome. The definitive point is that any additional cost, such as costs associated with uplift, must be recovered from end-use consumers in the closed loop of electricity markets (or alternatively if this cannot be recovered the resource must exit the market); neither of these scenarios result in ideal market outcomes. This argument can be derived from first principles.

As noted during the webinar, the notion of applying a cost-causality approach to uplift is not usually a practical or generally accepted approach. The core set of uplifts (ancillary services, unit commitments, out-of-market activities) are to reliably serve all end use-load and are thus recovered on that pro-rata basis.

The proposal outlined during the webinar was evaluated on the basis of core principles including efficiency, competition, and fairness/equity. The separate treatment of station service was an important consideration to ensure broadly consistent treatment of other station service in the market.

The IESO will work with stakeholders to ensure a cost-effective implementation framework to realize this proposal.

Topic

A different approach

Feedback

The Market Surveillance Panel recommended a different approach for the application of uplift charges. Though the Panel agreed that reducing uplift costs for storage resources is a good step toward removing barriers and increasing fairness in the market, the Panel indicated that they believed an approach based on energy reinjections would be preferable because such an approach would help to incent efficient operation of storage facilities. The Panel noted:

- The electricity "lost" to inefficiency will not be provided back to the market and may, in some facilities, account for the majority of the difference between withdrawals and injections. Proper management of these losses could provide a competitive advantage to the storage operator as well as maximize value to the market. Although the ESRs will already be exposed to the impact of inefficiencies between the energy withdrawn and energy injected based on energy prices, incorporating the costs for the uplift will further improve market conditions in rewarding highly efficient ESRs to improve their profitability and to benefit consumers. This will provide the ESR an additional incentive to minimize costs.

IESO Response

The IESO explored at a high-level various 'credit-on-injections' schemes but ultimately determined that the partial exemption proposal was a more effective option. The 'reinjection' ratio can vary significantly due to the fact that market conditions may lead to very low energy utilization of an ESR (on a monthly or annual basis). Often ESR value to the market is through operating reserve or increased quick start flexibility rather than day-to-day energy flows. The low utilization means a credit on injection scheme can lead to instances of significant 'residual' uplift cost that still needs to be recovered from the market.

The IESO believes that market signals and resource competition already provide strong incentives for ESRs (and other resources) to be more cost-competitive.

Topic

Station service

Feedback

Two stakeholders provided feedback suggesting station service should also be exempt from uplift charges:

- OPG believes that station service or any other usage of the load withdrawn that allows for the ESR to operate should be included in the uplift exemption. OPG understands that the IESO would like to treat ESRs similar to generators in regards to uplift applied to load for station service, but the technology is inherently different. OPG believes that ESRs should not have to pay for the load required to operate their resources when they are providing energy storage capabilities to the grid.

- The implementation of the proposal to only apply the exemption to fuel utilized in the provision of services requires further evaluation. ESC is of the opinion that station service or other load withdrawn that allows for the storage facility to operate should be included in the uplift exemption.

IESO Response

At this stage, to ensure a consistent treatment with other resources, 'fuel' will be the only basis for the uplift exemption.

Topic

Keeping implementation simple

Feedback

Some stakeholders provided feedback recommending the IESO keep implementation simple:

- With regards to implementation, OPG would not support additional metering to segment station service or other commercial loads. The cost required to install new operating/revenue meters with SCADA communication to the IESO is very costly, and the onus should not be on the ESR participant to provide it, especially since the value to be regained from the Market Rule governed uplifts is inherently small. Settling the amounts or determining the percentages of rebates for uplift charges after-the-fact would be a more reasonable option. OPG is curious about how other jurisdictions are able to separate the uplift charges on 'fuel' vs. usage for other purposes (commercial or resource use). If an energy storage facility is stand-alone e.g. pumped hydroelectric resource, do other jurisdictions parse out the uplift charges for "fuel" and continue to charge uplift for station service? The complexity of parsing out the uplift charges for "fuel" seems to be complicated and onerous, given the IESO has mentioned the Market rules-governed uplift charges averages approximately 1% of total wholesale market charges. OPG would encourage the IESO to review what other jurisdictions are doing and if there is enough value to obtain by parsing out the uplift charges.
- The Market Surveillance Panel suggests the IESO explore approaches to the uplift exemption that are simple in concept and implementation, ensuring that all consumption or losses would be appropriately subject to uplift charges. Such an approach would also enhance transparency and fairness. One example would involve charging all withdrawn energy at the corresponding hourly rate, multiplied by a factor that represents the ratio of withdrawn energy that has not been re-injected.
- Energy Storage Canada noted that the cost of installing separate station service metering and communications would be extensive with minimal benefit to the market. Settlement of the fuel exemption based on percentage of consumption would be more reasonable.

IESO Response

The IESO appreciates feedback provided on implementation. The IESO agrees that implementation of the 'fuel' exempt approach should be kept simple so as to not cause any unintended complexities or

barriers to participation. This feedback will be considered as the IESO explores a fair and transparent approach to implement the 'fuel' exempt from uplifts principle.

Topic

Further discussion on implementation

Feedback

Two stakeholders, which shared their overall support for the proposal, noted that they are looking forward to discussing implementation further:

- TC Energy requires greater clarity from the IESO on how they will determine which MWhs are identified for other purposes and therefore must pay uplift charges. For example, will separate metering be required to measure the other purpose MWhs? Further, will the IESO provide a definitive list of services (e.g., cooling, lighting, station services) that are exposed to uplift charges?
- The EDA looks forward to the IESO detailing the implementation of this approach (e.g., definitions, formulas).

IESO Response

The IESO thanks stakeholders for their support and will keep the stakeholder community abreast of future phases of design work to further enable storage in the IAM's, including next steps for the application of uplift charges to storage facilities.

Topic

Scope of uplift proposal

Feedback

One stakeholder requested confirmation that the uplift exemption would only apply to Market Participants, and not be applicable to storage facilities that operate to manage end-use consumption or engage in energy arbitrage, such as those connected behind-the-meter (BTM) of a load facility.

IESO Response

The scope of the SDP is focused on storage facilities that participate directly in the IAMs. The IESO confirms that SDP design elements, such as uplift allocation, have been discussed in this context only and do not apply to BTM facilities.

In the future and outside of this project, the IESO expects to explore frameworks for other resource types (BTM, hybrids) that choose to actively participate in the IESO markets.

Topic

Fuel tax concept

Feedback

One stakeholder requested clarity on the rationale for describing uplift costs as a 'fuel tax' for ESRs.

IESO Response

The 'fuel tax' concept was by way of an analogy to describe the dynamic concept of how fees to suppliers are passed through to the consumer (in another context). It was meant to illustrate an important principle about how the incidence of this cost ends up falling on the end use customer.

Topic

Transmission charges

Feedback

Several stakeholders noted that IESO should be involved in the review of transmission charges:

- It is OPG's belief that the removal of transmission charges, set at the OEB, should also be supported by the IESO and the pursuit by Market Participants assisted by the IESO in accordance with this Storage Design Project.
- TC Energy also recommends that the IESO seek to launch a joint engagement session with the OEB to explore similar exemptions for energy storage to the proposed approach for uplifts. As mentioned in the TC Energy comments above, energy storage facilities are not end-use customers and therefore should be provided unique treatment to ensure end-use customers are not paying "fuel taxes" for the benefits of energy storage. Many of the changes require coordination between the IESO and OEB to enact and therefore the IESO should seek to work with the OEB as soon as possible.
- The proposal to exempt IESO administered uplifts from the fuel energy storage facilities consume in the provision of wholesale market services is a good start but should also be applied to all uplifts (GA, IESO, transmission etc.). ESC would work with the IESO and market participants to present the benefits of full uplift exemptions to the government and OEB.

IESO Response

The IESO thanks stakeholders for sharing their perspectives on transmission charges related to ESRs. Through the SDP, the IESO focused only on uplift charges within the IESO's purview. In the future, if and when the OEB further examines the application of transmission charges for storage resources, the IESO would be a willing participant in public engagement on this topic.

Topic

Next steps for storage integration

Feedback

One stakeholder requested clarity on what will be enabled, and when, stating:

- It would be helpful for market participants if the IESO would provide clarity on which storage design project features will be implemented in parallel with Market Renewal, and which design features would need to wait until after Market Renewal before implementation. The features that will be enabled through the new 'three phases' of the storage design project (Interim Phase, Market Renewal Phase and Long Term Design), need to be clearly communicated to market participants in order for them to make decisions on how their resources can participate in the IAM during each phase.

IESO Response

The IESO understands the request for more clarity on next steps for storage integration. This topic is being explored as part of ongoing IESO business planning efforts. The IESO will seek to provide additional details at the September SDP engagement meeting, and will continue to communicate with stakeholders on future market enhancements once the SDP is completed.

Topic

Market Renewal Project (MRP)

Feedback

Several stakeholders provided feedback on the relationship between the storage design project and MRP:

- TC Energy has previously raised the issue that coordination between the SDP and MRP is required to ensure the interim design proposals from SDP are reflected in the detailed design documents for MRP. TC Energy requests that the IESO MRP and SDP teams provide a clear and complete summary of how the interim design proposal will be incorporated into the MRP detailed design.
- The Market Surveillance Panel encourages the retention of an enduring solution for integration of storage in the current scope for the MRP, while still maintaining existing MRP timelines, to send a clear signal that removing barriers to market entry for all resource types is a priority for the IESO.
- The EDA acknowledges that the IESO has determined that the enduring storage design (i.e., per long-term design proposal) is out of scope of the MRP and that as a result the IESO will need to adapt its interim design. The EDA recommends that the IESO conduct additional stakeholdering on the Market Rule and Market Manual amendments required to appropriately implement an adapted interim design. The EDA assumes that these changes will need to be implemented in parallel with the implementation of MRP (i.e., for a projected 'go-live' March 2023 date).
- 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. Although OPG understands the rationale it is disappointing the IESO has decided that the

enduring storage design project would not be included in scope of the Market Renewal Project (MRP).

- EDF strongly recommends that the IESO provide guidance and information on how decisions made in the interim phase of the SDP (i.e., the existing draft market rule and market manual amendments) will be incorporated into the MRP detailed design.

IESO Response

The IESO has determined that the enduring storage design will not be implemented as part of MRP. As a result, the IESO is committed to updating the interim storage design in time for MRP go-live in order to ensure that the progress made through the SDP is not lost. The IESO is currently considering the best path forward for this effort and will communicate the timing, scope and approach to stakeholders once they are determined.

Topic

Expanding SDP scope

Feedback

One stakeholder recommended the IESO expand the scope of the project, including the uplift exemption, to other types of storage resources, such as hydrogen. It was further proposed the IESO consider providing a One stakeholder recommended the IESO expand the scope of the project, including the uplift exemption, to other types of storage resources, such as hydrogen. It was further proposed the IESO consider providing a rebate on the cost of electricity charged to energy resources connected to the grid (in an amount equal to the amount of the global adjustment charge that would otherwise be incurred), for the electricity withdrawn and converted into hydrogen through the process of electrolysis.

IESO Response

The SDP project is nearing completion and the IESO does not intend to expand the project's scope at this time. However, beyond the scope of the SDP, the IESO is aware of and is considering opportunities to enhance participation for other types of storage resources including BTM resources and hybrid resources.

The allocation of Global Adjustment falls within the jurisdiction of the Ministry of Energy Northern Development and Mines. The IESO does not plan to provide cost rebates to specific technology types in order to offset Global Adjustment charges.

Topic

Coordination with the Ontario Energy Board (OEB)

Feedback

One stakeholder recommended the IESO and OEB consider coordinating regulatory framework changes:

- EDF believes there is significant potential for energy storage resources to provide value to both the IAM and electricity infrastructure (i.e., transmission and distribution systems). It is not clear to EDF how the Ontario Energy Board and IESO are coordinating on treatment of energy storage resources and it is likely to harm the ability for energy storage to achieve its full value proposition in Ontario. EDF recommends that the IESO and OEB consider coordinating regulatory framework changes to ensure the full value of energy storage is realized for the benefit of Ontario electricity customers. For example, during system planning and preferred solution selection for power system needs the treatment of wholesale market revenue is inconsistent and overly conservative. The IESO and OEB should work with stakeholders to determine how estimates of future wholesale market revenue should be treated with respect to planning decisions and rate-recovery for electric utilities.

IESO Response

The IESO is committed to coordinating effectively with OEB staff and does so through regular communication on issues related to distributed energy resources (e.g., participation on policy initiative working groups, regional planning process review[1], etc.) including energy storage.

To address concerns that insufficient coordination between the two entities is occurring it would be helpful for the IESO to understand the specific topics that are of concern to stakeholders.

[1] The IESO and the OEB are coordinating on the implementation of the recommendations from the review which involves but is not limited to: evaluation of how the process might evolve to better adapt to a changing planning context (including growing interest in non-wires solutions, aging existing transmission assets, and shifts to market-based solutions).