

Market Rule Amendment Proposal Form

Part 1 - Market Rule Information

Identification No.:	MR-00446-R04
Subject:	Implementation of the Interim Storage Design
Title:	Interim Design
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration <input type="checkbox"/> Deletion <input checked="" type="checkbox"/> Addition
Chapter:	7
Appendix:	
Sections:	Chapter 7: 21
Sub-sections proposed for amending:	Various

Part 2 - Proposal History

Version	Reason for Issuing	Version Date
1.0	Draft for Technical Panel Review and Comment	September 8, 2020
2.0	Publish for Stakeholder Review and Comment	September 16, 2020
3.0	Submitted for Technical Panel Vote	October 13, 2020
4.0	Recommended by Technical Panel; Submitted for IESO Board Consideration	October 20, 2020

Approved Amendment Publication Date:

Approved Amendment Effective Date:

Part 3 - Explanation for Proposed Amendment

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

This proposal contains the market rules needed to implement the interim design of the storage design project. This interim design allows near-term for electricity storage participants to access IESO markets until such time as IESO's tools are able to recognize the unique nature of energy storage resources. As these rules are anticipated to change in the future, they proposed to be located in a dedicated section of chapter 7, so as to facilitate future revisions. This proposal is dedicated to this section 21.

Section 21 begins with a purpose section that outlines the nature of the section and the rationale for having these interim rules in one dedicated section. It then outlines the options for registering an energy storage resource device with the IESO, the registration differing depending on the services the participant wishes to provide. The provision of regulation services in particular requires a unique registration profile which is outlined. Given that a single storage facility will have dual registrations as outlined in section 21.2, the offers and bids submitted in day ahead and real time must adhere to limitations to prevent conflicting dispatch instructions from being sent by the IESO's tools which is outlined in sections 21.4 and 21.5. Essentially these limitations are such that there must not be an overlap in the prices between offers and bids, to prevent such conflicting instructions. The interim design allows electricity storage facilities to signal state of charge limitations to the IESO during the two-hour mandatory window, which the section Revisions to Dispatch Data enables. Requirements unique to storage resources in their provision of Operating Reserve are needed given the constraint that state of charge imposes on their operations. Lastly, the Appendices of Chapter 7 have not been edited to include electricity storage, instead the interpretation section outlines how that section should be interpreted for storage.

Background

The IESO proposes to amend the market rules to address a specific set of barriers to the integration of energy storage resources in the IESO's markets. These barriers within the IESO's purview were identified in the December 2018 IESO [report](#), "Removing Obstacles for Storage Resources in Ontario". Addressing these barriers required changes to both Market Rules and Market Manuals, consistent with one of the report's recommendations that the IESO "should review and amend its market rules, where possible, to clarify the participation of storage resources in IESO-administered markets".

The IESO developed a design to integrate electricity storage resources for an interim and longer term period of time. An interim period was needed to facilitate the near term participation of electricity storage resources until the IESO's scheduling and optimization tool can recognize the

unique characteristics of energy storage resources: they participate both as a load and a supply and are limited in each by its state of charge. The suite of changes in MR-00446 are designed to both clarify the participation of storage resources in the interim period and include rules that may not need to change to support the long term design.

Both the interim design for integrating electricity storage resources along with draft market rules were reviewed with stakeholders through the [Energy Storage Advisory Group](#). Feedback has been largely supportive of the proposed amendments. Stakeholders had requested clarifications in a few sections and revisions have been made to reflect this feedback.

Discussion

Chapter 7

- 21.1; This purpose section outlines that these are interim rules intended to be replaced when electricity storage resources are more fully integrated into the market rules. They are contained in this specific section for convenience of reference.
- 21.2; An electricity storage facility shall be registered two times, one as a generation resource for the injections it can provide, and second as a load resource for withdrawals.
- 21.3; Electricity storage participants wishing to provide regulation service must register as a self-scheduler and cannot participate in the energy or operating reserve markets.
- 21.4; As part of the day-ahead commitment process, electricity storage participants must ensure that their bids to withdraw energy does not overlap with their offers to inject energy.
- 21.5; The bids and offers in real time for an electricity storage facility must not overlap, and if they do, there is no entitlement to congestion management settlement credits.
- 21.6; Reductions in the quantities offered or bid may be made to dispatch data by electricity storage facilities within two hours of a given dispatch hour due to state of charge limitations.
- 21.7; Conditions as outlined in the design document that govern the ability for an electricity storage facility to provide operating reserve.
- 21.8; This outlines how the amendments will pertain to electricity storage facilities, particularly in the appendix to Chapter 7 which has not been edited.

Chapter 7

21.1 Purpose

21.1.1 This section 21 sets out *market rules* intended to facilitate the near-term inclusion of *electricity storage participants* in the *IESO-administered markets* and the connection of *electricity storage facilities* to the *electricity system*. A number of the provisions of this section would, based on their subject matter, ordinarily be included under different chapters or sections of the *market rules*. However, these provisions have been gathered together here under a single section for convenience of reference and until such time that *electricity storage participants* and *electricity storage facilities* are more fully integrated under these *market rules*.

21.2 Market Registration

21.2.1 This section 21.2 applies for the purposes of the market registration process set out in Section 2.2 of this Chapter 7.

21.2.2 An *electricity storage participant* wishing to register an *electricity storage facility* as a *self-scheduling electricity storage facility*, shall:

21.2.2a register all *electricity storage units* associated with that *electricity storage facility* as *self-scheduling generation units* to inject electricity;

21.2.2b register all *electricity storage units* associated with that same *electricity storage facility* as *non-dispatchable loads* to withdraw electricity; and

21.2.2c fulfill all other applicable requirements for market registration relating to *self-scheduling generation facilities* and *non-dispatchable loads*, including those requirements set out in Appendix 4.24 of Chapter 4 (IESO Monitoring Requirements: Electricity Storage Facilities) and Appendix 4.25 of Chapter 4 (Monitoring Requirements: Electricity Storage Performance Standards)”.

21.2.3 Subject to the *market rules* governing participation in the *energy markets* and the provision of *ancillary services* to the *IESO*, a *self-scheduling electricity storage facility* may only be registered to participate in the *energy market* and to provide *reactive support service*, *voltage control service*, or *regulation service* or

combinations of the foregoing, except that it shall not be registered to both participate in the *energy market* and provide *regulation service*.

21.2.4 An *electricity storage participant* wishing to register an *electricity storage facility* as a dispatchable *electricity storage facility*, in addition to the requirements for market registration outlined elsewhere in the *market rules* pertaining to the facility types referenced below, shall:

21.2.4a register all *electricity storage units* associated with that *electricity storage facility* as dispatchable *generation units* to inject electricity;

21.2.4b register all *electricity storage units* associated with the same *electricity storage facility* as dispatchable loads to withdraw electricity; and

21.2.4c fulfill all other applicable requirements for market registration relating to dispatchable *generation units* and *dispatchable loads*, including those requirements set out in Appendix 4.24 of Chapter 4 (IESO Monitoring Requirements: Electricity Storage Facilities) and Appendix 4.25 of Chapter 4 (Monitoring Requirements: Electricity Storage Performance Standards).

21.2.5 Subject to the *market rules* governing participation in the *energy markets* and the provision of *ancillary services* to the IESO, a dispatchable *electricity storage facility* may only be registered to provide *energy, operating reserve, reactive support service* or *voltage control service*, or combinations of the foregoing and may participate in the *capacity auction*.

21.3 Provision of Regulation Service

21.3.1 An *electricity storage participant* wishing to provide *regulation services* must register its *electricity storage facility* as a *self-scheduling electricity storage facility* as set forth in section 21.2.2, but excluding section 21.2.2b.

21.3.2 Notwithstanding section 2.2.9A.1, an *electricity storage participant* may apply to register as a *self-scheduling electricity storage facility* any *electricity storage facility* that has an *electricity storage capacity* greater than 10 MW up to 50 MW in capacity for the purposes of providing *regulation services* only, provided that the IESO determines that there are no adverse impacts on the reliable operation of the IESO-controlled grid;

21.3.3 An *electricity storage facility* that is registered to provide *regulation services* may not participate in the *energy market* or the *operating reserve market*.

21.4 Day-Ahead - Energy Offers and Energy Bids

21.4.1 In addition to submitting either an *offer* to inject *energy* or a *bid* to withdraw *energy* as part of the day-ahead commitment process, an *electricity storage participant* may also submit both an *offer* to inject *energy* and a *bid* to withdraw *energy* for a single dispatchable *electricity storage unit* for the same *dispatch hour*.

21.4.2 For each *dispatch hour* in which both *energy offers* and *bids* are submitted in accordance with section 21.4.1, the *electricity storage participant* shall ensure that the lowest price of the *offers* submitted for that *electricity storage unit* to inject *energy* is greater than the highest price of any *bid* for that same *electricity storage unit* to withdraw *energy*.

21.5 Real Time Energy Offers and Energy Bids

21.5.1 Notwithstanding section 3.5.1, an *electricity storage participant* that is registered and wishes to submit *energy offers* or *energy bids* relating to a dispatchable *electricity storage unit* may submit both an *offer* to inject *energy* and a *bid* to withdraw *energy* for that *electricity storage unit* during the same *dispatch hour*.

21.5.2 For each *dispatch hour* in which both *energy offers* and *bids* are submitted in accordance with section 21.4.1, the *electricity storage participant* shall ensure that the lowest price of the *offers* submitted for that *electricity storage unit* to inject *energy* is greater than the highest price of any *bid* for that same *electricity storage unit* to withdraw *energy*.

21.5.3 An *electricity storage provider* whose lowest *offer* price for an *electricity storage unit* to inject *energy* in any *dispatch hour* is less than or equal to its highest *bid* price for the same *electricity storage unit* to withdraw *energy* in that same *dispatch hour* is not entitled to congestion management *settlement* credit determined in accordance with section 3.5.2 of Chapter 9 in respect of that *dispatch hour*, and if paid the IESO may recover such inappropriate congestion management *settlement* credit in accordance with section 3.5.6E of Chapter 9

21.6 Revisions to Dispatch Data

21.6.1 Notwithstanding section 3.3.5, the IESO shall approve reduced injections or

withdrawal amounts included in revised *dispatch data* from *electricity storage participants* submitted within 2 hours of a given *dispatch hour*, up to a closing time stipulated in the applicable *market manual*, where the *electricity storage participant* determines, acting reasonably that its *electricity storage unit* may reach its:

21.6.1a. *lower energy limit* in that *dispatch hour*, and will likely prevent the *electricity storage unit* from injecting *energy* in accordance with its *offer*;
or

21.6.1.b *upper energy limit* in that *dispatch hour*, and will likely prevent the *electricity storage unit* from withdrawing *energy* in accordance with its *bid*.

21.7 Operating Reserve

21.7.1 *An electricity storage participant shall not offer operating reserve from a dispatchable electricity storage facility in any dispatch hour when there is a simultaneous energy bid and energy offer in the real-time market for that facility in the same dispatch hour.*

21.7.2 *An electricity storage participant shall only offer operating reserve from the electricity storage unit registered as a dispatchable generation unit to represent its injection capabilities pursuant to Section 21.2.2a if:*

21.7.2.1 *the dispatchable electricity storage unit is exclusively offered as a dispatchable generation unit for the entire dispatch hour;*

21.7.2.2 *the dispatchable electricity storage unit registered as a dispatchable load shall not bid to withdraw energy from the real-time market nor offer operating reserve in the subsequent dispatch hour; and*

21.7.2.3 *the remaining duration of service at the time stipulated in the applicable market manual is greater than or equal to the period of time stipulated in the applicable market manual.*

21.7.3 *An electricity storage participant shall only offer operating reserve from the electricity storage unit registered as a dispatchable load to represent its withdrawal capabilities pursuant to Section 21.2.2b if:*

- 21.7.3.1 The dispatchable *electricity storage unit* is exclusively bid as a *dispatchable load* for the entire *dispatch hour*;
- 21.7.3.2 The dispatchable *electricity storage unit* registered as a dispatchable *generator* shall not offer to inject *energy* in the *real-time market* nor offer *operating reserve* in the subsequent *dispatch hour*; and
- 21.7.3.3 The *remaining duration of service* at the time stipulated in the applicable *market manual* is greater than or equal to a period of time stipulated in the applicable *market manual*.

21.8 Interpretation

- 21.8.1 To the extent of any conflict or inconsistency between the provisions of this section 21 and any other provisions of the *market rules*, the provisions of this section 21 shall govern.
- 21.8.2 With respect to Chapter 7, System Operations and Physical Markets-Appendices, the *IESO* will, acting reasonably and consistently at all times with the scope and intent of the amendments referenced in section 21.1:
- 21.8.2a treat electricity storage injecting, or proposing to inject *energy*, as either a dispatchable or self-scheduling generation resource; and
- 21.8.2b treat electricity storage withdrawing, or proposing to withdraw *energy*, as either a *dispatchable load* or *non-dispatchable load*, in each case, deeming such changes to be made to the applicable provisions of such Appendices or applicable *market manuals* as may be necessary to give full meaning to the foregoing.
- 21.8.3 For further certainty, the reference in section 21.7.2a to the use of dispatchable or self-scheduling generation resources in the interpretation of Chapter 7, System Operations and Physical Markets-Appendices and the applicable *market manuals*, shall not include any features or attributes that pertain primarily to and are distinctive of *intermittent generators, flexible nuclear generators, variable generators, or transitional scheduling generators*.