

June 19, 2020

To: Stakeholders

Re: Reply to Stakeholder Comments – 2020 Plan for Energy Storage Roadmap Integration Activities; Overview of Short-term Market Implementation Requirements for Energy Storage Participation; and Overview of Energy Storage Resources – Operating Reserves Qualification & Technical Requirements and Alberta Reliability Standards Applicability

The Alberta Electric System Operator (“AESO”) issued the following documents regarding the Energy Storage Roadmap integration activities and energy storage participation under the existing AESO authoritative documents and requested stakeholder feedback on the same:

- 2020 Plan for Energy Storage Roadmap Integration Activities, posted on April 21, 2020 (“2020 Plan”);
- Overview of Short-term Market Implementation Requirements for Energy Storage Participation, posted on April 9, 2020 (“Short-term Market Implementation Overview”); and
- Overview of Energy Storage Resources – Operating Reserves Qualification & Technical Requirements and Alberta Reliability Standards Applicability, posted on April 23, 2020 (“Short-term OR and ARS Overview”).

These documents are located on the AESO’s website at www.aeso.ca by following the path: Stakeholder Engagement > AESO initiatives > Energy Storage.

The AESO thanks stakeholders for reviewing and providing their comments on these three documents. The AESO has reviewed these comments and is providing the following responses and updates as they relate to the high-level themes of:

- the 2020 Plan;
- the short-term implementation phase of the AESO’s Energy Storage Roadmap;
- the long-term implementation phase of the AESO’s Energy Storage Roadmap;
- the short-term OR and ARS overview;
- market reporting and forecasting;
- the ISO tariff; and
- energy storage as a transmission alternative to building new transmission infrastructure.

Response to Recommended Improvements to 2020 Plan for Energy Storage Roadmap Integration Activities

The AESO’s Energy Storage Roadmap published in August 2019 included a high-level integrated project schedule spanning from 2019 to 2022. Energy storage challenges existing concepts, ISO rules, and legislation so a more detailed plan will continue to be developed as we gain a better understanding of the work required. Responses relating to the specific activities for the short-term and long-term implementation phases of the Energy Storage Roadmap are further detailed below. As the project

schedule extends through 2022, the AESO will continue to publish annual plans for Energy Storage Roadmap integration activities.

The AESO will regularly update the 2020 plan as activities progress and will inform stakeholders of these changes or updates as part of its stakeholder engagement. The COVID-19 pandemic has impacted the progress of some activities for both the AESO and its stakeholders, which will need to be considered for the 2020 plan update. Notably, the AESO is reviewing the best way to accommodate future stakeholder engagement activities with consideration of efficient use of time and resources, while continuing to ensure our approach allows stakeholders' needs and interests to be consistently, transparently and meaningfully considered.

Response Regarding Short-term Implementation

As part of the short-term implementation phase of the AESO's Energy Storage Roadmap, the AESO identified areas of the current AESO authoritative documents that could benefit from further clarity regarding how energy storage proponents would operate under the existing framework. This clarity will be provided in a series of information documents the AESO has updated or developed in consideration of energy storage. While this additional clarity is being provided through information documents, it is the obligation of all legal owners, operators, market participants and pool participants (including energy storage proponents) to ensure they understand and comply with all AESO authoritative documents applicable to them, and the legislative framework, including the *Fair, Efficient and Open Competition Regulation*.

The AESO reviewed and considered stakeholder feedback as well as the conclusions and rationale set out in the Short-term Market Implementation Overview and Short-term OR and ARS Overview documents to update and develop the series of information documents. To serve as a guide, the AESO developed Information Document #2020-013, *Energy Storage Guide*, which lists the information documents that have been updated or developed in consideration of energy storage and provides general information applicable to all energy storage proponents. Information Document #2020-013, *Energy Storage Guide* is posted to the AESO's website at www.aeso.ca.

In response to stakeholder feedback around unclear or inconsistent terminology (such as "firm" or "non-firm"), the AESO amended and developed the series of information documents using consistent terminology that is already used in current AESO authoritative documents and related information documents.

Response Regarding Long-term Implementation

The AESO expects that the work conducted as part of the long-term implementation phase of the AESO's Energy Storage Roadmap will result in changes to the AESO's authoritative documents. For energy storage to participate in Alberta's electricity markets under the current framework, it is treated as a generator and/or a load. While the current legislative framework does not prohibit the participation of energy storage in the markets, in practice, the existing legislation, regulations and AESO authoritative documents do not fully contemplate the unique attributes and challenges associated with energy storage participation on the interconnected electric system. The AESO's long-term integration of energy storage will cover the development of recommended changes to AESO authoritative documents that capture the unique attributes of energy storage in a flexible, technology agnostic manner.

The AESO notes that development and amendments of ISO rules are subject to AUC Rule 017, *Procedures and Process for Development of ISO Rules and Filing of ISO Rules with the Alberta Utilities Commission*, which provides for consultation and feedback from interested parties at the time of development of any proposed rules in advance of an AESO application to the AUC for approval of those rules. The AESO encourages stakeholders to participate in any stakeholder consultation regarding ISO rules to understand the impact to their businesses.

Response to Short-term OR and ARS Overview

In response to stakeholder feedback, the AESO has revised the Short-term OR and ARS Overview document to reflect updated diagrams and calculations. This revised version of *Overview of Energy Storage Resources – Operating Reserves Qualification & Technical Requirements and Alberta Reliability Standards Applicability* will be posted alongside this letter and will be blacklined to indicate the updates to the original document.

In addition to the revised *Overview of Energy Storage Resources – Operating Reserves Qualification & Technical Requirements and Alberta Reliability Standards Applicability*, and updates to Information Document #2013-005R, *Operating Reserves*, the AESO is also providing the following thematic responses to stakeholder comments to the Short-term OR and ARS Overview document:

Qualification and Eligibility for Operating Reserves

- Market participants applying for a specific operating reserves service need to fulfill the specific technical requirements specified in the appropriate ISO rules. As part of the qualification process, market participants will be required to submit documents, certified by a professional engineer, such as single line diagrams, duty-cycle specifications, Inverter-Power Conversion System (PCS) characteristics, frequency responsiveness in charging as well as in discharging mode, equipment datasheets, PCS/Inverter datasheets, factory acceptance test reports, model validation test reports and operating philosophy. This information will help the AESO assess the technical capability of the specific resource to provide the operating reserves service as specified in the ISO rules. These qualification requests will be assessed on a case-by-case basis.

Ancillary Services Products

- The AESO is in the process of developing a fast frequency response service product which is expected to be similar to the load shed service for imports product and which would allow energy storage resources to participate, subject to meeting technical and operational requirements. The need for additional products, beyond existing ancillary services products, will depend on system needs and associated engineering studies. Additionally, the AESO is also evaluating the role of energy storage in other ancillary services, apart from operating reserves, and will modify existing products and technical requirements in the long-term implementation phase for the integration of energy storage, if appropriate.

Applicability of Reliability Standards

- The 67.5 MW bulk electric system threshold discussed in the Short-term OR and ARS Overview is only for the applicability of reliability standards to aggregated generating facilities. For the short-term implementation phase, specific qualification including size threshold in MW and technical requirements for the operating reserves market will continue to be as per Section 205.4 of the ISO rules, *Regulating Reserve Technical Requirements and Performance Standards*, Section 205.5 of the ISO rules, *Spinning Reserve Technical Requirements and Performance Standards* and Section 205.6 of the ISO rules, *Supplemental Reserve Technical Requirements and Performance Standards*. Energy storage resources which meet the requirements specified in these ISO rules and are approved by the AESO will be eligible to participate in the operating reserves market. Additionally, it is noted that Alberta reliability standards are developed based on the North American Electric Reliability Corporation's (NERC's) applicability of reliability standards to aggregated generating facilities.

Response Regarding Market Reporting and Forecasting

The AESO has made changes to incorporate energy storage into its current public facing market reports on the AESO website. A review is currently being conducted to assess the need for additional changes and reporting on energy storage. The AESO intends to use the Energy Storage Learning Forum to gather information regarding the forecasting of energy storage. The AESO will also hold stakeholder

engagement sessions when developing long term plans which include the consideration of emerging technologies and potential impact to the grid.

Response Regarding ISO Tariff

As part of the short-term implementation phase of the AESO Energy Storage Roadmap, system access service is provisioned by the current ISO tariff. While the current ISO tariff does not prohibit energy storage, the AESO recognizes that it was not originally designed with energy storage in mind. However, as discussed as part of the AESO's 2018 Independent System Operator Tariff Application filed with the AUC in Proceeding 22942, the AESO previously launched an initiative to explore how energy storage can connect to the transmission system and participate in the Alberta electricity market. In this review, the analysis indicated that the ISO tariff has cost implications for energy storage, which provide configuration and operational signals to energy storage proponents.

The AESO has initiated stakeholder engagement on its Bulk and Regional Tariff Design to review the cost allocation for bulk and regional wires costs. As part of this engagement, the AESO is reviewing the treatment of energy storage in the context of the broader consideration of rate design to ensure an efficient tariff design that achieves alignment between price signals and the costs of providing service. The AESO recognizes the importance of providing clarity and certainty for parties on the future tariff design, including energy storage proponents, to inform investment and operational decisions. The AESO is endeavoring to progress this review as quickly and efficiently as possible while engaging effectively to support an efficient regulatory process. Though the Bulk and Regional Tariff Design engagement work is currently paused due to the COVID-19 pandemic, the AESO encourages all interested parties to continue to participate in this engagement once it resumes.

Response to Energy Storage as a Transmission Alternative to Building New Transmission Infrastructure

The AESO is investigating potential opportunities to utilize non-wires solutions, including energy storage, as an alternative to building traditional transmission infrastructure. The AESO's objective is to adopt a flexible approach to planning the transmission system that maximizes its ability to propose non-wires solutions when appropriate. The AESO recognizes the importance of coordinating and aligning this work with energy storage market participation and tariff considerations and other energy storage long-term integration activities.

As articulated in the Distribution System Inquiry, the AESO supports the application of competitive forces where possible, and has a strong preference against the ownership of non-wires alternatives by regulated entities due to concerns regarding potential market distortions and FEOC issues.¹ The AESO will continue to work towards adopting a more flexible approach to system planning that is consistent with this position.

Sincerely,

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¹ AESO-AUC-9NOV201913, Exhibit 24116-X0518, PDF 40-44), the AESO's Combined Module Written Submission, Exhibit 24116-X0594, PDF 9-10; and the AESO's Combined Module Response Submission, Exhibit 24116-X0641.