2020 Plan for Energy Storage Roadmap Integration Activities

Introduction

In support of the Energy Storage (ES) Roadmap, published in August 2019, this plan provides an overview of the ES Roadmap integration activities that the AESO intends to progress in 2020. The intent is to provide stakeholders with a consolidated view of the proposed ES integration activities for their information and planning purposes. This material focuses solely on ES Roadmap integration-related activities.

The AESO plans to engage stakeholders during the integrated-activity process phases in alignment with the newly launched AESO *Stakeholder Engagement Framework* available on www.aeso.ca. The plan below outlines these phases and anticipated stakeholder engagement, recognizing timelines may change as activities progress and more information becomes available. The AESO will update this table bi-annually with information including detailed timelines and engagement opportunities as each activity progresses.

The AESO continues to work cross-functionally across the organization to ensure all AESO initiatives which are connected or interrelated remain coordinated as appropriate.

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ES integration process phases

The following provides a description of the ES integration process phases:

Analysis (A)

In the Analysis phase the AESO identifies market issues resulting from stakeholder feedback, market participant proposals, AESO identified issues, government policy, Market Surveillance Administrator (MSA) originated work or investigations, or market design reviews. The Analysis phase is an internal work phase for the AESO. There may be activities that the AESO has not yet progressed internally to the point of determining the requirement for stakeholder input. Such activities may not appear on the plan and may be added once initial analysis has been completed or an engagement decision has been reached. While in this phase the AESO will, as required, research and define the issue, analyze other markets, perform analytics, seek out expert opinions, and ultimately decide on whether to move forward to the next phase.

Conception (C)

During the Conception phase the AESO will formalize the issue and conduct an options analysis. Input for the options analysis may be gathered through stakeholder engagement and/or third-party studies. From this effort the AESO may develop recommendations, and/or determine the stakeholder engagement approach.

Development (D)

During the Development phase the AESO works with stakeholders to create proposed draft ISO rules or changes to ISO rules. The proposed drafts are released to stakeholders for comment, and those comments are considered in the development of a proposed ISO rule or Authoritative documents (ADs).

Regulatory (R)

The Regulatory phase begins with the filing of an application for approval of a proposed ISO rule with the Commission, and typically concludes with the issuance of a Commission decision on the application but may extend beyond a Commission decision if compliance filings or review and variance applications need to be addressed.

Implementation (I)

The Implementation phase includes changes to information technology, business processes, training, and ISO rules. The longest implementation timeline would be for the new ISO rules.

Engagement (E)

The Engagement phase may include a range of stakeholder engagement approaches from inform to collaborate depending on the topic and issue being considered and the outcomes being sought.

*Of note, the approaches taken and extent of activity for each phase will be uniquely dependent on each ES integration activity.

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Classification	ES Roadmap Integration Activities	2020 Q1 J	2020 Q1 F	2020 Q1 M	2020 Q2 A	2020 Q2 M	2020 Q2 J	2020 Q3 J	2020 Q3 A	2020 Q3 S	2020 Q4 O	2020 Q4 N	2020 Q4 D
Education and Awareness	**ES Progress Updates – UPDATED** Share progress on the Energy Storage (ES) Roadmap integration activities, interrelated initiatives as well as provide a forum to address stakeholder questions.			E				E		E			E
	ES Industry Learnings Forum (ESILF) – UPDATED Organize forum to provide expertise and key learnings to the AESO on targeted matters related to the integration of energy storage in Alberta.					E				E		E	
Active Connection Projects	**Participation under Existing Market Rules – COMPLETE** Develop and/or modify Information Documents (IDs) to provide clarity under existing market rules as required.	C	C	C	E	E	I						
	Interim AESO System Modifications – COMPLETE Define and implement requirements for AESO system modifications that need to be made to support in-service dates for active connection projects under the existing framework.	I	I	I	I	I	I						
Phase 1 Short-term Implementation	**System Access Service Request (SASR) Form Modification – COMPLETE** Investigate requirements to modify the SASR Form to improve the collection of connection information required for ES assets.	C	C	C	C	C	I						
	ISO Tariff Design – ON HOLD Work in concert with ISO tariff design to ensure ES is considered.	Progress will align with Bulk and Regional Tariff Design											
Phase 2 Long-term Implementation	**Forecasting, Planning and Market Reports** Develop and implement forecasting and planning models to support Long-term Outlook (LTO) and Long-term Transmission Plan (LTP).				A	A	A	A	A	A	A	A	A
	Configuration, Qualification and Connection Requirements Develop appropriate functional specification documents; identify market participation options, permissible configurations and metering requirements for ES.				A	A	A	A	A	A	C	C	C

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Classification	ES Roadmap Integration Activities	2020 Q1			2020 Q2			2020 Q3			2020 Q4		
		J	F	M	A	M	J	J	A	S	O	N	D
	Market Participation Evaluate long-term options for energy storage participation in the Energy and Ancillary Service markets.			A	A	A	A	A	A	C	C	C	C
	Operations Perform technical studies for the review of the operating parameters and requirements for the different types and configurations of ES; identify the impact to the connection processes and system applications to enable full range of ES operation.			A	A	A	A	A	A	C	C	C	C
	Storage as a Transmission Alternative (SATA) Develop evaluation criteria and quantification of benefits of SATA as a non-wire solution; identify technical parameters and configurations, asset ownership and market participation options for SATA.		A	A	A	A	A	A	C	C	C	C	C

ES integration process phases: Analysis (A), Conception (C), Development (D), Regulatory (R), Implementation (I), Engagement (E)

ES Roadmap integration activities

Please refer to the ES Roadmap on the AESO website.

I. Education and Awareness

ES Progress Updates

At regular intervals, the AESO will share progress on the ES Roadmap integration activities, provide an update on interrelated initiatives as well as provide a forum to address stakeholder questions.

ES Industry Learnings Forum

The AESO is conducting an ES Industry Learnings Forum (ESILF) to provide expertise and key learnings to the AESO on targeted matters related to the integration of energy storage in Alberta. The kick-off session was held on May 20th with the attendance of all the 20 members, Alberta Energy, MSA and AUC. Based on feedback from the membership, due to workload and Covid-19 impacts, the next session is schedule for September 18th, 2020.

This is an information gathering forum for the AESO, not a decision body. The ESILF Terms of Reference are available on the AESO's website.

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II. Active Connection Projects

Participation under Existing Market Rules

Develop and/or modify Information Documents (IDs) to provide clarity to market participants for the connection, qualification and operation of ES assets under existing market rules as required. This activity has been completed with the posting of the IDs on June 19th and a Response Letter to the feedback received from stakeholders. Please click HERE to view the new and amended ES IDs or visit the AESO website at www.aeso.ca and follow the path: Rules, Standards and Tariff > Information Documents. The Response Letter can be found by following this LINK or the following path once at the AESO website: Grid > Energy Storage > Participation Under Existing Market Rules.

Interim AESO System Modifications

Define and implement requirements for AESO Energy Management System (EMS) modifications and market system tools that need to be made to ensure that the system controllers and real time management team can effectively manage these new assets and support in-service dates for active connection projects. The required changes for this activity were implemented in early June and are ready for the first active connection project to be connected to the AIES.

III. Phase 1: Short-term Implementation

System Access Service Request (SASR) Form Modification

Investigate what is required to modify the SASR Form to improve the collection of connection information required for ES assets. A revised SASR was posted on the AESO's website in Q2 reflecting energy storage content and for use in the connection process going forward. A revised SASR is expected to be posted when the new Tariff comes into effect.

ISO Tariff Design

Will work in concert with ISO tariff design to ensure ES is considered in the 2020 Bulk and Regional Tariff Design. The Tariff work stream is currently on hold and scheduled to resume in September 2020.

IV. Phase 2: Long-term Implementation

Forecasting, Planning and Market Reports

The primary purpose of this change area is to develop and enhance forecast and planning models to consider energy storage in the forecasting, planning and market reports processes within AESO. This work will consider when and how much energy storage could develop within Alberta through the Long-term outlook, the impact of energy storage to transmission planning through the long-term planning report and how storage needs to be incorporated in the public facing market reports.

AESO has incorporated energy storage into the long-term adequacy report. Currently, work is on-going in review of the technical modelling data, any further changes related to reporting of energy storage in the public facing market reports and forecasting of energy storage in Alberta.

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Configuration, Market Qualification and Connection Requirements

The primary purpose of this activity is to clearly understand the current and potential future configurations of ES assets, how these configurations may be enabled in the future and to form an understanding of whether any changes may need to be made to enable participation. The process for connection and the criteria to qualify for market participation will also be reviewed for potential changes.

This work includes a review to integrate energy storage assets in the connection process including system access request documentation, project modeling & study scenarios, functional specification template, technical requirements and metering practices; exploring any unique challenges encountered, capture learnings and make recommendations. Applicability of technical requirements and reliability standards will be determined. Other activities include:

- Determination of capacity size and any unique requirements to qualify to provide ancillary services
- Assess the capability to provide out-of-market ancillary services including the approach and requirements to do so
- Monitor active connection projects to understand configurations and planned market qualification, including understanding the unique aspects of energy storage technologies and project configurations (in coordination with the market participation change area).

Market Participation

The intent of this activity is to clearly understand how different configurations of ES assets could participate in the various markets (and contractual services / products) which includes the rules pertaining to offers and bids, dispatch and dispatch compliance, settlement and credit, and supply surplus and short-term adequacy.

The AESO has completed the market related activities related to the short-term integration of energy storage through updates to Information Documents providing clarity on energy storage participation in the energy and operating reserve markets. The AESO has initiated work on the long-term activities related to market participation and will be engaging stakeholders throughout the design process. The evaluation of the long-term options includes:

- Hybrid participation
- Half-range energy offers versus full-range participation
- Defining State of Charge
- Commissioning requirements for storage

It is expected that ADs would be updated as a result of the long-term integration activities.

Operations

The intent of this activity is to clearly understand and assess the operation of ES assets in the various markets in order to support long-term integration activities. With the potential for ES assets to participate in multiple markets and contractual products, operating methods and tools must consider this functionality. The Energy Management System (EMS) along with the suite of market operations tools are being reviewed to ensure that the existing software and tools are fully capable to support the long-term integration of the energy storage in the operation domain for the safe and reliable operation of the grid.

This activity also includes performing technical studies to assess existing technical requirements in the ancillary services and explore opportunities to modify such requirements when possible considering Fair, Efficient and Openly Competitive (FEOC) principles and safe and reliable operation of AIES. The existing technical requirements in the operating reserves, such as minimum

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size qualification and minimum duration requirement, are being evaluated in order to potentially lower the threshold requirements. In addition, the technical requirements in fast frequency response (i.e. LSSi) and black start services are being examined for potential amendment to enable long term energy storage participation.

Storage as a Transmission Alternative (SATA)

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. The AESO will continue to work towards adopting a more flexible approach to system planning that is consistent with this position.

The work on SATA will also include a review of technical parameters/requirements, market impacts, technical and economic assessments, transmission planning process and associated requirements for regulatory processes (i.e. NID) etc.

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