

## 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](http://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.

## 2020 Plan for Energy Storage Roadmap Integration Activities

### 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 make a decision 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.

## 2020 Plan for Energy Storage Roadmap Integration Activities

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
Education and Awareness	<b>ES Progress Updates NEW</b> Share progress on the ES Roadmap integration activities, interrelated initiatives as well as provide a forum to address stakeholder questions.			E			E			E			E
	<b>ES Industry Learnings Forum (ESILF) NEW</b> 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		E	
Active Connection Projects	<b>Participation under Existing Market Rules</b> Develop and/or modify Information Documents (IDs) to provide clarity under existing market rules as required.	C		E	I								
	<b>Interim AESO System Modifications</b> Define and implement requirements for AESO system modifications that need to be made to support in-service dates for active connection projects.	I											
Phase 1 Short-term Implementation	<b>System Access Service Request (SASR) Form Modification</b> Investigate requirements to modify the SASR Form to improve the collection of connection information required for ES assets.	C				I							
	<b>ISO Tariff Design</b> Work in concert with ISO tariff design to ensure ES is incorporated.	Progress will align with Bulk and Regional Tariff Design											
Phase 2 Long-term Implementation	<b>Forecasting, Planning and Market Reports</b> Develop and implement forecast/planning models to support Long-term Outlook (LTO) / Long-term Transmission Plan (LTP).			A									
	<b>Configuration, Qualification and Connection Requirements</b> Develop appropriate functional specification documents; identify market participation options, permissible configurations and metering requirements.		A					C					
	<b>Market Participation</b> Evaluate the characteristics of the different ES assets and the markets they could participate in; provide input into the potential configurations of ES assets and their ability to participate in the markets.			A					C				

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
	<b>Operations</b> 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					C				
	<b>Storage as a Transmission Alternative (SATA)</b> 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					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* **NEW**

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* **NEW**

The AESO is organizing 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. 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.

### 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.

***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.

**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.

***ISO Tariff Design***

Will work in concert with ISO tariff design to ensure ES is incorporated into the 2020 Bulk and Regional Tariff Design.

**IV. Phase 2: Long-term Implementation*****Forecasting, Planning and Market Reports***

Develop and implement forecast and planning models that include ES into the forecasting, planning and market report processes within AESO, and if there should be any changes to identified areas in order to do it successfully, especially to support the Long-term Outlook (LTO) and Long-term Transmission Plan (LTP). It will enable a more comprehensive understanding of the impact and value of ES to the grid, as well as how it needs to be included in the forecasting, planning and reporting processes.

***Configuration, 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 for market participation will also be reviewed for potential changes.

***Market Participation***

The intent of this activity is to clearly understand any and all limitations for ES assets to participate in the various markets (and contractual services / products) and determine how the various potential configurations of ES Resources will be able to make the full value of the unique asset that energy storage is, available to the benefit of the end users.

Review of the current AESO Authoritative Documents (AD) will occur to ensure a full understanding on how these documents apply and are interpreted for ES assets across the AIES, and will identify restrictions or limitations in these documents that either prevent or inhibit enabling the full capability of ES assets on the AIES. Documentation of specific AESO ADs and their articles that pose any type of restriction on ES assets will be produced. The team working on this set of activities will collaborate with other areas for system and reporting requirements.

***Operations***

The intent of this activity is to clearly understand any and all limitations for ES assets to operate in the various markets in order to develop a framework to reflect the various potential configurations of ES assets and how those configurations affect the operation of those assets in the different markets and in support of a reliable AIES. With the potential for ES assets to qualify for participation in multiple markets and contractual products, operating methods must suit multi-use assets.

Review of the current AESO Authoritative Documents (AD) will occur to ensure a full understanding on how these documents apply and are interpreted for ES assets across the AIES, and will identify restrictions or limitations in these documents that either prevent or inhibit enabling the full capability of ES assets on the AIES. Documentation of specific AESO ADs and their articles that pose any type of restriction on ES assets will be produced. Based on the various technical studies that are already underway, or will be in early 2020, the various operating parameters and requirements for the different configurations are to be reviewed so as to understand the system applications needed to enable the full range of the ES assets.

### ***Storage as a Transmission Alternative (SATA)***

The objective of this activity is to determine the evaluation criteria and quantification of benefits of SATA as a non-wire solution, technical parameters, asset ownership and market participation eligibility would be the key areas related to this project. It will be accomplished by a clear understanding of the limitations (if any) for ES assets to connect to the Alberta Interconnected Electric System (AIES) in a form of SATA. A framework will be developed in order to reflect the various potential configurations of ES assets and how those configurations affect their ability to connect to the AIES and provide this service. In addition, the options for SATA will be explored to confirm if the existing mechanisms could enable the required SATA timing and level.