

# 2023 Plan for DER Roadmap Integration Activities



## Introduction

This plan provides an updated overview of the 2023 Plan for DER Roadmap Integration Activities in support of the [AESO Distributed Energy Resources \(DER\) Roadmap \(DER Roadmap\)](#).

Based on the priority of these DER Roadmap integration activities, high and medium priority activities will continue to progress in 2023. Some activities are completed and are being monitored by the AESO through biannual trigger-point assessments. The purpose of these assessments is to understand when distributed energy resource (“DER”) volumes have reach a level that warrants reinitiating certain activities.

For those activities that require stakeholder feedback, the AESO will continue to engage with stakeholders during the conception and development phases (described below), in alignment with the AESO Stakeholder Engagement Framework<sup>1</sup>. In addition, progress updates and information on engagement opportunities will be communicated to stakeholders through biannual progress updates. The plan below outlines an anticipated timing for the DER Roadmap integration activities and, where applicable, their anticipated stakeholder engagement, while recognizing timelines may change as activities progress and more information becomes available.

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

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<sup>1</sup> <https://www.aeso.ca/assets/downloads/Stakeholder-Engagement-Framework-Report-FINAL.pdf>

## 2023 Plan for DER Roadmap Integration Activities

### DER integration process

The following provides a description of the DER integration process:

#### *Analysis (A)*

In the analysis phase, the AESO identifies issues resulting from internal analysis, stakeholder feedback, government policy or market design review. This phase is an internal phase for the AESO and there may be initiatives that have not yet progressed to the point of requiring stakeholder input. Such initiatives may not appear on the plan and may be added once initial analysis has been completed or an engagement decision has been reached. In this phase, the AESO may research and define the issue, analyze the implemented solution in other jurisdictions, perform analytics, and seek out expert opinions to determine 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. The AESO may develop recommendations and determine necessary stakeholder engagement.

#### *Development (D)*

During the development phase, the AESO works with stakeholders to create proposed Independent System Operator (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 (AD).

#### *Regulatory (R)*

The regulatory phase begins with filing an application for approval of a proposed ISO rule with the Alberta Utilities Commission (AUC) and typically concludes with the issuance of a decision on the application. It may also extend beyond an AUC 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, and 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 - with the purpose to inform or to collaborate - depending on the topic and issue being considered and the outcomes being sought.

The approach taken and the extent of activity for each phase will be dependent on each DER Roadmap Integration Activity. For example, not all activities will result in new proposed ISO rules or changes to an ISO rule, therefore these activities will not go through Development and Regulatory phases prior to entering the Implementation phase.

Classification	DER Roadmap Integration Activities	Priority Rank	2023 Q1			2023 Q2			2023 Q3			2023 Q4			Status	
			J	F	M	A	M	J	J	A	S	O	N	D		
Stakeholder Engagement	<b>DER Progress Updates</b> Share progress on activities, other interrelated initiatives and address stakeholder questions.							E						E		
	<b>Data</b>															
Reliability	Assess and implement minimum SCADA data trigger level	M	I													In Progress
	<b>Forecasting</b>															
	Forecast DER gross generation and gross load separately (AESO internal activity)	L	Complete												Monitor	
	Geographical forecast of DER sizes at the POD level (AESO internal activity)	L	Complete												Monitor	
	<b>Modelling</b>															
	Energy storage model	H	Progress will be aligned with <a href="#">AESO Energy Storage</a> – see Phase 2 Long-term Implementation activities												Monitor	
	Incorporate DFO advancement in real time DER modelling	L	Complete												Monitor	
	<b>Coordinated Planning</b>															
	Enhance Transmission planning process in coordination with Transmission/Distribution (Tx/Dx) coordinated planning framework	H	Progress will be aligned with Tx/Dx Initiative													
	<b>Coordinated Operation</b>															
Incorporate DER into net demand forecasting process (AESO internal activity)	L	Complete												Monitor		

Classification	DER Roadmap Integration Activities	Priority Rank	2023 Q1			2023 Q2			2023 Q3			2023 Q4			Status
			J	F	M	A	M	J	J	A	S	O	N	D	
	<b>Technical Interconnection Requirement</b>														
	Voltage and frequency ride-through requirement		I												In progress
	UFLS program	L	Complete												Monitor
	Transmission Protection and Control coordination and Effective Grounding		Complete												Monitor
	Islanding and anti-islanding coordination	L	Complete												Monitor
	Restoration coordination	M	C												In progress
	Commissioning and testing requirements	L	Complete												Monitor
	Cybersecurity requirements	M	I												In progress
<b>Market Efficiency</b>	<b>Market Participation</b> Evaluate and assess options that encourage DER market participation	M	Progress will be aligned with <a href="#">Energy Storage Rule Amendments</a> and <a href="#">Operating Reserve Market Review</a> .												
<b>Tariff</b>	<b>Tariff</b> Evolve tariff framework that drives effective long-term price signals that encourage efficient use of the Tx and Dx system	M	Progress will be aligned with <a href="#">Bulk and Regional Tariff Design</a>												

DER Roadmap Implementation Phases: Analysis (A), Conception (C), Development (D), Regulatory (R) Implementation (I), Engagement (E)

DER Roadmap Priority Rank: H= High Priority, M= Medium Priority, L= Low Priority. The completed phases and planned phases outside of this 12-month period are not shown.

## DER Roadmap Integration activities

As activities are completed, they will be marked “complete” in the above schedule. Completed activities with a “monitor” status will continue to undergo periodic trigger-point assessment reviews twice a year to determine any further integration activities to be implemented based on DER volume growth.

### 1. Stakeholder engagement

#### a. DER progress update

At biannual intervals, the AESO will share progress on the DER Roadmap integration activities, provide an update on interrelated initiatives, as well as address stakeholder questions.

Additional ad hoc stakeholder engagement will be considered, as needed.

### 2. Reliability

The following are reliability-related DER Roadmap integration activities that the AESO is progressing to ensure continued reliability of the Alberta Interconnected Electrical System (AIES), the pace of which is driven by areas experiencing increasing DER growth.

#### a. Data

Accurate knowledge of DER volumes, locations, resource types, and site characteristics is critical to reliably integrate higher volumes of DER into the AIES.

**SCADA Data (DERs less than 5 MW)** – The AESO presently does not receive SCADA data for DERs smaller than 5 MW. Expanding the AESO Control Centre’s real time visibility of DERs smaller than 5 MW was explored by the AESO with Distributed Facility Owners (DFOs). The conclusion of the discussion is that the AESO will continue to maintain 5 MW minimum SCADA data trigger. For DERs less than 5 MW, the AESO plans to leverage existing SCADA data from DFOs and is discussing establishing connectivity with DFOs to enable SCADA data exchange for DERs less than 5 MW in 2023.

#### b. Forecasting

Increased knowledge of DER data will enhance the AESO’s forecasting processes, from long term to real time. In addition, these forecasting processes will be enhanced to explicitly forecast DER growth and penetration.

**Forecast of DER gross generation and gross load separately and incorporate hourly variability** – In the AESO’s current near-term/real time forecast (which supports AESO’s real time operation), DERs smaller than 5 MW are embedded as part of the net load forecast (i.e., gross load minus DER generation). The AESO plans to establish a process to estimate gross load and gross generation of DERs less than 5 MW for solar to understand the impact on the AESO’s net load forecast. Based on the current DER penetration for DERs less than 5 MW, this work will

add marginal benefit to understanding net load variability. The AESO will continue to monitor DER growth to determine when completion of this work will be beneficial.

**Geographical forecast of DER sizes at the POD level** – For DERs less than 5 MW, the AESO plans to establish a process to forecast rooftop solar at the point-of-delivery (POD) level for the near-term/real time forecast. In 2021, the AESO implemented new planning area-level forecasting with embedded DER generation that will increase the accuracy of operations processes. Further enhancement down to the POD level will provide marginal benefit while requiring capital and significant resources to implement. Hence, the AESO will monitor DER growth to determine when enhancement down to the POD level will be beneficial.

#### ***c. Modelling:***

DER models need to be adequately captured in AESO's power system models, which will be used in numerous planning and operating processes that support the reliability of the AIES.

**Energy storage model** – DER energy storage resources (ESRs) need to be modelled in AESO's Central Power System (CPS) and real-time Energy Management System (EMS) to support various AESO planning and operation functions. In 2020, CPS and EMS energy storage modelling work, which covers both transmission-connected and distribution-connected energy storage, was completed. The EMS energy storage model will be enhanced as part of the ES long-term implementation initiative, currently in its initiation phase. The details of the DER Energy Storage model are covered under this initiative, and its scope and timeline will be developed as part of the [Energy Storage Roadmap](#).

#### ***d. Coordinated planning***

With increasing DER penetration, the AESO's transmission planning will be enhanced with inputs from improved data, forecasting and modelling processes coupled with the Tx/Dx Coordinated Planning framework initiative. Engagement with DFOs, transmission facility owners (TFOs) and industry participants will follow the [Tx/Dx Coordinated Planning framework](#) initiative timeline.

#### ***e. Coordinated operation***

**Incorporate DERs into net demand forecasting process** – Enhance AESO's net demand forecasting by incorporating wind and solar variability in the net demand for renewable DERs larger than 5 MW and incorporate DFO SCADA data and static data for DERs smaller than 5 MW. Net demand forecasting for renewable DERs larger than 5MW have been completed. Net demand forecasting for DERs less than 5 MW is to be completed following completion of assessment for **Forecast of DER gross generation and gross load separately and incorporate hourly variability**.

#### **f. Technical interconnection**

As more DERs are connecting and supplying energy, they may impact the reliability of the AIES. The AESO explored appropriate technical interconnection recommendations with input from DFOs and TFOs via the DER Technical Performance Exploration Group (TPEG). Based on feedback received from TPEG, the AESO will publish a series of technical assessment papers to identify the AESO's recommended implementation approaches to address various technical aspects of integrating DERs.

**Voltage and frequency ride-through requirement:** [An assessment paper](#) on the topic was published on March 31, 2021 based on AESO, DFOs and TFOs discussions. As a result of further feedback from Original Equipment Manufacturers (OEMs) as well as updates from the industry, the AESO proposed a two-tier implementation approach, where DERs  $\geq 150$  kW continued to meet the December 2021 implementation timeline, while DERs  $< 150$  kW will meet the December 2022 implementation timeline in consideration of the delayed release of UL 1741 SB. The proposed two-tier implementation approach was aligned with TFOs/DFOs and was welcomed by the DER proponents. The AESO published an [updated assessment paper](#) on June 2, 2022 to reflect the 2-tier implementation approach. According to the implementation status updates received from DFOs in November 2022, Fortis, ATCO, Enmax and City of Medicine Hat have already implemented the ride-through requirements recommended by AESO to cover a full range of new DER projects, including microgeneration projects (less than 150kW). EPCOR, Red Deer and Lethbridge are on track to update interconnection agreements to incorporate ride-through requirements for DERs less than 150 kW by the end of 2022.

**Under Frequency Load Shedding (UFLS) coordination:** The AESO has completed an assessment of current DER impact on Alberta Under Frequency Load Shedding (UFLS) program. DER connections impact the ability for loads on that feeder to participate in the UFLS program. These limitations are identified in the functional specification document and asks DFOs to address the concern, as required. The AESO will monitor DER volumes and reassess the impact on the UFLS program, as appropriate.

**Transmission Protection and Control coordination and Effective Grounding:** The AESO, DFOs and TFOs had exploratory discussions relating to Transmission Protection and Control coordination as well as effective grounding with addition of DERs in load-only facilities. No action other than coordination is currently required for Protection and Control. [An assessment paper](#) on Effective Grounding was published on March 31, 2022.

**Islanding/Anti-islanding:** The AESO, DFOs and TFOs had exploratory discussions relating to anti-islanding coordination. An [Anti-Islanding Screening and Study Guideline](#) was published on September 9, 2022.

**Restoration coordination:** This activity is rescheduled to start in 2023.



**Commissioning and Testing requirement:** The AESO had discussions with DFOs and TFOs on DER Commissioning/Testing requirements in November 2021. The AESO published an [assessment paper](#) on the topic on August 17, 2022, and will continue to monitor and assess the need for a province-wide guideline or set of requirements related to commissioning tests, routine tests, model validation tests, etc.

**Cybersecurity requirements:** The AESO and DFOs may have exploratory discussions in 2023 regarding whether a foundational cybersecurity guideline would be beneficial for transferring DER SCADA data to the AESO.

### 3. Market

This activity is designed to facilitate DER integration and access to the energy and ancillary services markets by removing unnecessary barriers and ensuring a fair, efficient, and openly competitive (FEOC) market. For energy market participation, the AESO is maintaining the current offer requirement size threshold of 5 MW or greater and is proposing voluntary participation in the energy market for source assets of 1 MW or greater and less than 5 MW. Voluntary Market Participation and its associated rule changes will be filed with the Energy Storage Rule Amendments. Please refer to [Energy Storage Rule Amendments](#) for related schedule.

For operating reserve market participation, AESO is proposing to reduce the minimum asset capability requirement from 15 MW to 1 MW for Regulating Reserve, from 10 MW to 1 MW for Spinning Reserve and from 5 MW to 1 MW for Supplemental Reserve. Changes to Operating Reserve minimum asset capability requirements will be aligned with the ongoing [Operating Reserve Market Review](#).

### 4. Tariff

The AUC approved the Adjusted Metering Practice (“AMP”) without legacy treatment and the AUC had directed the AESO to submit an implementation plan that addresses the timing and costs of implementing the AMP. On December 10, 2021, the AESO submitted its AESO Implementation Plan Application to the AUC for approval. The AUC did not approve this application. The AESO is currently assessing next steps, more information can be found on the [AESO website](#).

The AUC made a decision on DCG Credit Module for Fortis's 2022 Phase II Distribution Tariff Application (AUC 26090 – Decision). The AUC has determined that the existing distribution-connected generation (DCG) credit mechanism within DFO’s respective tariffs will be discontinued.

In November 2022, the AUC issued a decision denying the applied for changes to the Bulk and Regional Rate Design. The AESO will reinitiate engagement on the Bulk & Regional Tariff Design in 2023, with the existing Rate DTS remaining in place in the interim.