

Introduction and Background

The AESO considers that the transformation of the Alberta interconnected electric system (AIES) from the existing one-way delivery of electric energy to a future state of two-way power flows will require increased coordination and planning between the transmission and distribution systems to deliver safe, reliable, and economic operation of the AIES and delivery of electric energy to customers. As progressive growth of Distributed Energy Resources (DER) within the distribution networks impacts energy flows in both directions, there is increased value in the coordinated planning between the AESO, Distribution Facility Owners (DFO) and Transmission Facility Owners (TFO) for the end-use customers.

This increased complexity of AIES planning and operation, together with overall AIES infrastructure costs to end-use customers, has resulted in more and deeper scrutiny of capital additions and improvements to the AIES, specifically as a result of DFO System Access Service Requests (SASR) resulting from deficiencies identified by a DFO on its distribution system.

In response to this, the AESO commenced an initiative to develop, in collaboration with industry, a framework to support the coordination of transmission and distribution planning, focused on the Tx/Dx interface and referred to as the Tx/Dx coordinated planning framework.

In May 2020, the AESO initiated engagement with DFOs, TFOs and industry/rate-payer groups (ADC, CCA, IPCAA and UCA) to help develop the problem statements for this initiative to focus on. These are:

1. The execution of DFO SASRs are lengthy, requiring more transparency and often result in time consuming regulatory proceedings which may impact service and cost to end-use-customers.
2. Alberta's economic situation combined with increasing costs to consumers for delivered electricity has resulted in the need for increased coordination, communication and visibility between the DFOs distribution planning and AESO's transmission planning duties, particularly as it relates to the need for new transmission infrastructure.
3. The transformation of the grid continues to progress at different rates across the province, particularly the increase in DER penetration, increase in variable generation, and corresponding increase in variable power flows at the Tx/Dx interface, driving the need for proactive and timely coordination of planning between the DFOs distribution system and Alberta's transmission system.

During the engagement with the DFOs, TFOs and industry/rate-payer groups, it has become clear that there is an urgent need to:

- a) enhance the AESO's decision making process to develop an efficient, transparent and balanced AESO decision-making framework for responding to DFO SASRs
- b) update and standardize the AESO's distribution deficiency report (DDR) guideline to ensure all required information is provided by the DFOs with their SASR application
- c) explore Connection Process improvements for dealing with DFO reliability and load SASRs.

In addition, the transmission distribution (Tx/Dx) coordinated planning framework also has ties to the *AESO Distributed Energy Resources (DER) Roadmap* (DER Roadmap) published on June 9, 2020, on page 16 within coordinated planning as a sub-set of the Reliability Pillar. The primary focus of the coordinated planning within the DER roadmap is two-fold: (1) to facilitate coordination and alignment of the AESO's long-term transmission plans and system NIDs with DFO planning, (2) alignment between DFO DER hosting capability and the AESO's transmission generation integration capability assessments.

The AESO plans to engage stakeholders during the conception and development phases of this work in alignment with the AESO Stakeholder Engagement Framework¹. In addition, information on progress and engagement opportunities will be communicated to stakeholders at the regular DER / Energy Storage progress update sessions.

This plan provides a detailed view of the Tx/Dx coordinated planning framework activities that the AESO intends to progress over the next 12 months, with the aim of improving or resolving the challenges described above. The diagram below outlines the estimated timing for the Tx/Dx coordinated planning framework activities and the associated stakeholder engagement, while recognizing timelines may change as activities progress and more information becomes available. This plan will assist stakeholders with planning for any activities they may be interested in participating in. The AESO continues to work cross-functionally across the organization to ensure all initiatives which are connected or interrelated will remain coordinated as appropriate. At this time the AESO is not anticipating any of these workstreams to require Regulatory or Authoritative Documentation development, however, should that need materialize the AESO workplan will be adjusted.

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

2021 Plan for Tx/Dx coordinated planning framework activities

AESO process for initiative activities

The following provides a description of the AESO process to develop, progress and implement initiative activities:

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 (or activities) that have not yet progressed to the point of requiring stakeholder input. Such initiatives (or activities) 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 for following stages.

Development (D)

During the development phase, the AESO works with stakeholders to create AESO guidelines, internal working documents, changes to AESO processes, 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 any final AESO documents, proposed ISO rule(s) or Authoritative Documents (AD).

Regulatory (R)

The regulatory phase begins with the filing of 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. For any documentation not requiring AUC approvals, the AESO regulatory phase will be an internal review to ensure compliance with Regulations and Legislation and confirm no unnecessary “red-tape” requirements are added to existing AESO processes.

Implementation (I)

The implementation phase includes changes to information technology, business processes, AESO training and ISO rules. The longest implementation timeline would be for 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 uniquely dependent on each Tx/Dx coordinated planning framework activity.

Classification	Tx/Dx Coordinated Planning Framework Activities	2021 Q3			2021 Q4			2022 Q1			2022 Q2		
		J	A	S	O	N	D	J	F	M	A	M	J
Stakeholder Engagement	Quarterly progress updates Updates will be delivered with DER Roadmap updates			E			E			E			E
Execution of DFO SASRs	Create DFO POD guidelines In support of DFO SASR connection process							D	D	D	D	D	D
	Update AESO Connection Process for DFO Reliability and Load SASRs Specific improvements for processing DFO SASRs and to incorporate above-mentioned framework and guidelines	D	D	D	D	D	D	I	I	I			
Tx/Dx Coordinated Planning	Tx/Dx Workshops to be confirmed for AESO and Participants to frame challenges and resultant actions required	C	C	C	C	C	C						
	Transmission Capability Assessment Coordinate the AESO transmission capability assessments with DFO DER Hosting maps		C	C	D	D	D	D	D	I			
Probabilistic Planning	Tx/Dx workshops to be confirmed for AESO and participants to frame the need for and implementation of probabilistic planning				A	A	A	C	C	C	D	D	D

Tx/Dx Integration Plan Implementation Phases: Analysis (A), Conception (C), Development (D), Regulatory (R), Implementation (I), Engagement (E)

The plan above shows the planned activity for the next 12 months; therefore, the completed phases and planned phases outside of this 12-month period are not shown.

Tx/Dx Coordinated Planning Framework Activities

1. Stakeholder engagement

a. Quarterly Progress Updates

At regular intervals, the AESO will share progress on the Tx/Dx coordinated planning framework integration activities, provide an update on inter-related initiatives as well as address stakeholder questions. These updates will be delivered quarterly with the DER Roadmap updates.

2. Execution of DFO SASRs (Problem Statement #1 & #2)

a. Create AESO Decision-Making Framework: Complete

b. Create DFO POD Guidelines:

In 2005 the AESO developed Distribution Point-of-Delivery (POD) Interconnection Process Guidelines, in coordination with DFOs. These guidelines consist of six documents which were intended to guide the development for DFO transmission interconnection projects and to support the AESO customer interconnection process at that time. However, these documents are out of date and were retired by the AESO in 2012. As such, they are not applicable to the current AESO Connection Process.

The AESO, DFOs and TFOs have recently reviewed the 2005 AESO Distribution POD Interconnection Process Guidelines. These guidelines contain some information which is still applicable today. The AESO will be engaging with DFOs, TFOs and industry/rate-payer groups to update and consolidate these POD guidelines into one concise document and when finalized, would support the DFO SASR Connection Process and potentially aid in reducing overall processing timelines.

Work postponed into 2022 due to other priorities.

c. Update AESO Distribution Deficiency Report (DDR) Guideline: Complete

d. Update AESO Connection Process for DFO Reliability and Capacity SASRs:

Since the inception of the current Connection Process in 2010, the AESO has actively sought to collaboratively and continuously make improvements to it through engagement and feedback from industry.

The AESO initiated the Tx/Dx coordinated planning framework initiative in 2020, where it was identified that the execution of DFO System Access Service Requests (SASR) are lengthy, require more transparency, and often result in time consuming regulatory proceedings which impact service timing and cost to end-use customers. Additionally, the AESO also received feedback from industry/rate-payer groups that there is a need to evaluate the role and scope of industry/rate-payer groups in the Connection Process to enhance transparency and process efficiencies as it relates to DFO SASRs. Through this engagement the AESO is evaluating specific changes to the Connection Process to: 1) provide a scalable / fit for purpose process for simple DFO requests, such as breaker additions; 2) introduce milestones to trigger the construction of approved projects; 3) introduce opportunities for earlier industry/rate-payer group involvement; 4) introduce other efficiency improvements

This work has continued to progress. Completion timing has been delayed into 2022 due to other priorities requiring AESO resources.

3. Tx/Dx Coordinated Planning (Problem Statement #2 & #3)

The AESO will continue engagement with DFOs, TFOs and industry/rate-payer to discuss the requirement for improved coordinated planning. The extent of the problem statement(s) will be explored, and appropriate actions developed to improve the coordination of planning, between the parties, from the current state. The AESO understands that these topics will become more important to AIES reliability with future DER growth and penetration and will explore methods in the Tx/Dx workshops to monitor both forecast and actual DER progress to trigger implementation of identified activities at an appropriate time.

As a reminder the DER Roadmap, published in June 2020, frames coordinate planning on page 16:

- **Coordinated planning**

Transmission planning processes will rely upon future forecasting and modeling process changes to effectively incorporate DER. As DER penetration increases, the AESO’s transmission planners will need to incorporate DER as supply resources into the AESO’s planning assessments. This may include evolving probabilistic generation supply analysis and congestion assessment tools. Probability-based analysis will be needed to effectively assess the unpredictable two-way power flow at the transmission–distribution system interface. The AESO’s transmission planners will continue to make efficient use of all existing transmission infrastructure, to the benefit of all users. This will require

engagement with DFOs to develop a process to facilitate coordination of the AESO’s long-term transmission plans and system NIDs with DFO planning. In addition, there is a need to align DFO DER hosting capabilities with the capability of the transmission system to integrate generation. This engagement process will be facilitated through the Tx/Dx coordinated planning framework.

- **Transmission Capability Assessment**

The AESO has been including transmission capability assessment information for renewable generation integration in its recent Long-Term Transmission Plans. Throughout 2020, the AESO has been enhancing our transmission capability assessments, including methodology and user interface. A workshop was held in September 2021 where the AESO and three DFOs shared their respective capability maps, providing an overview of their assumptions and methodologies for the attending AESO team members, TFOs, and DFOs. The team identified several commonalities and opportunities for further coordination. The AESO is planning to host an industry stakeholder information session in Q4 2021 to provide awareness and an update on the AESOs progress of our Transmission Capability Assessments. with the aim to publish the transmission capability map in 2022 Q1.

4. Probabilistic Planning (Problem Statement #2 & #3):

Recent Commission decisions for DFO driven reliability upgrade NID applications, highlight the need for assessing the value, merits and impacts of probabilistic planning to support the AESO decision making. The AESO is committed to improving its processes and will engage with DFOs, TFOs and industry/rate-payer groups to examine the merit, potential parameters and application of incorporating probabilistic analysis into DFO driven reliability system access service requests. Any probabilistic planning potential work scopes identified in this exploration process would be designed to complement the decision-making framework process.