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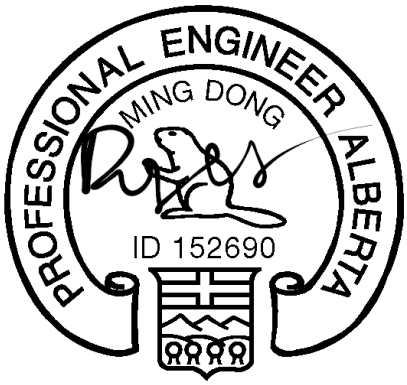

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AESO Congestion Portal

PERMIT TO PRACTICE
INDEPENDENT SYSTEM OPERATOR
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May 7, 2026	V1.0	Congestion Portal First Release

Contents

1. Introduction

This report outlines the assumptions and methodology used to calculate the congestion statistics published through the Alberta Electric System Operator (AESO) Congestion Portal (the portal).

1.1 Portal Objectives

The portal provides congestion data and geographic context to support market participants in making informed decisions about the size and location of their connection project:

- Areas with higher congestion are likely to result in a more complex connection request.
- Areas with lower congestion are the favorable locations to consider.

1.2 Portal Disclaimer

The AESO makes no representations, warranties, or guarantees, express or implied as to the accuracy, reliability, completeness, currency, or non-infringement of the map and associated information or that it will be suitable for any use. While the AESO has made every attempt to ensure that the information is timely and accurate, the AESO accepts no responsibility whatsoever for any inaccuracy, error, or omission in the map and associated information. The AESO is not responsible for any losses or costs incurred by you or anyone else as a result of the use, conversion, publication, transmission, installation, or improvements to the portal and associated information, even if such losses or costs are foreseeable. The AESO Connection Process remains the official process for facilitating market participants' requests for new or modified system access services on Alberta's transmission system. The AESO will determine the final connection alternative through applicable technical studies and assessments, regardless of any interpretation or inference you or anyone else may draw from the map or any associated information.

2. Portal Assumptions and Criteria

This section describes the underlying assumptions used in calculating the congestion statistics.

2.1 Assumptions

2.1.1 Study Year

Congestion statistics are calculated by studying each hour in the study year 2030.

Any modelled generating unit or transmission system project is assumed to be in service prior to January 1, 2030. Thus, every modelled generating unit and transmission system project is simulated as in-service for the entire calendar year 2030.

2.1.2 Generation

The congestion assessment includes all existing generators and projects[1] that have met the AESO's inclusion criteria[2] as of January 2026.

2.1.3 Demand

Demand is modelled at each point of delivery following the *2024 Long Term Outlook*.[3]

In addition, two large data center loads from Phase 1 of the Large Load Integration program[4] have been added to the demand. Their total size is 1,200 MW.

Table 1 – Large Data Center Loads

Project Name	Contract Size (MW)	Location
P2936 GLDC Load	970	12S Heartland
P3083 Keephills Data Centre Phase I	230	320P Keephills

2.1.4 Transmission Topology

Transmission system topology is modelled per the existing transmission system, with the following additions:

1. Connection projects are included using the AESO-preferred connection alternative.
2. *Central East Transfer-Out Transmission Development*[5] (CETO) Stage 2 is included.
3. *City of Edmonton Transmission Reinforcement*[6] (CETR) is included.

The existing facility ratings, provided by the legal owners of transmission facilities, are assumed in the transmission system model, except for the facility ratings that will be modified by any of the above additions.

The Cassils-Bowmanton-Whitla Path consists of 240-kV transmission lines:

- 1034L (Bowmanton 244S – Cassils 324S)
- 1035L (Bowmanton 244S – Newell 2075S)
- 1074L (Elkwater 264S – Bowmanton 244S)
- 1074AL (1074AL Tap - Woolchester 1019S)
- 964L (Whitla 251S – Murray Lake 326S)

[1] The AESO Connection Project List is available on the AESO website.
[2] The definition of project inclusion criteria is available in the Connection Project List Guide on the AESO website.
[3] The 2024 LTO is available on the AESO website.
[4] Phase-1 Large Load Integration program information is available on the AESO website.
[5] AUC Decision 25469-D01-2021.
[6] AUC Decision 28633-D01-2024.

- 964AL (964AL Tap - Granlea 1024S)
- 965L (Bowmanton 244S – Murray Lake 326S)
- 983L (Elkwater 264S – Whitla 251S).

The path's limit of 850 MW was determined through operational studies.

Congestion is reported for transmission facilities that operate at 69 kV and above, and where the project is greater than 3% effective. Congestion is not reported for transformers.

2.2 Criteria

Transmission Planning (TPL) Standards, which are part of the Alberta Reliability Standards, set the performance requirements for planning the transmission system. These standards define the portal's performance criteria.

A direct current (DC) power flow solver is used to assess thermal performance criteria. This model does not assess voltage or stability.

- Studying only the thermal performance criteria is considered acceptable given the portal's objective to assist market participants in making informed business decisions about the size and location of their connection project, while supporting efficient use of the transmission system.

Congestion statistics are calculated based on Category A (N-0) thermal limits under normal system conditions. Category B (N-1) contingency limits, voltage or transient stability limits, or the effects of remedial action schemes are not included. Voltage and stability criteria are applied to selected transmission corridors to reflect overall system operating limits.

3. Methodology

This section explains the methodology used to calculate the congestion statistics.

3.1 Process Overview

The portal approximates congestion in three main steps:

1. **Conduct a congestion assessment:** Perform a congestion assessment by using a direct current power flow solver with existing generating units, generating units that have met the AESO's project inclusion criteria[7], forecasted load, and the network topology with planned transmission system projects.

2. **Model the project:** Model the hourly production profile of the project.

[7] The definition of project inclusion criteria is available in the Connection Project List Guide on the AESO website.

3. **Calculate the congestion statistics:** Calculate the congestion frequency (%) and congested energy (MWh) for the congested transmission lines.

3.1.1 Step 1: Conduct a Congestion Assessment

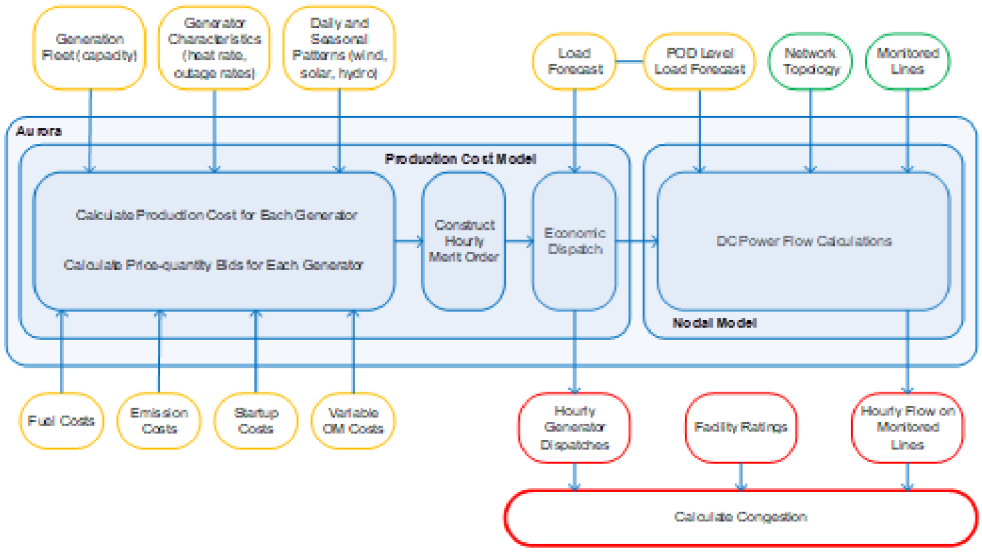
Congestion occurs when the transmission system cannot accommodate all in-merit generation, because the resulting power flows would contravene reliability standards and/or ISO rules.[8] The congestion assessment combines a production cost model with a transmission system network model.

The production cost model simulates the hourly energy market economic dispatches required to supply the forecasted hourly demand.

Then, the transmission system network model calculates the hourly power flows on each transmission facility that result from the hourly energy market dispatches and demand.

Figure 1 illustrates the inputs and processes involved in the congestion assessment.

Figure 1 - Congestion Assessment Process



3.1.2 Step 2: Model the Project

The project's hourly production profile is modelled by scaling the production profile of a generating unit with similar characteristics according to maximum capability.

[8] The reliability standards and ISO rules are available on the AESO website

3.1.3 Step 3: Calculate the Congestion Statistics

The congestion is calculated by adding the project's hourly production profile to the pre-project transmission flows and calculating the change in flows. The change in flows is calculated using the change in injection at each bus, weighted by their effectiveness factor to each facility.