

Ensuring an Uncongested Transmission System

Congestion and bottlenecks prevent us from accessing the full strength of the Alberta Interconnected Electric System. The Alberta Electric System Operator (AESO)'s mandate is to identify where transmission system improvements are needed and facilitate the connection of generation and load to ensure a robust, affordable and unconstrained transmission system.

What is an unconstrained transmission system?

A robust and unconstrained transmission system is one that provides non-discriminatory access and sufficient transmission capacity so all customers can connect without constraint.

Why is it important to have an unconstrained transmission system?

An unconstrained grid provides certainty to those who invest in new generation projects that they will have the ability to ship their electricity to Alberta industry, businesses, farms and households. It gives those in other industries the confidence to do business in the province, secure in the knowledge that power will be there when they need it.

Managing transmission system demand

AESO engineers, economists and planners analyze electricity consumption patterns in every area of the province and integrate data from multiple sources to determine where the demand for electricity will grow, where and how much generation is required to meet that demand, and what additional transmission infrastructure is required. That information is compiled in the AESO's *Long-term Transmission System Plan*.

Current forecasts show the system requires both expansion and reinforcement. There have been no major upgrades to the backbone of the transmission in over two decades. During that same time, our population has grown by 45 per cent and gross domestic product by 455 per cent.

So far, Alberta has managed to maintain a reliable system by introducing tools and practices that stretch the physical limitations of the electrical system. System controllers constantly monitor the grid to ensure electricity supply meets demand by coordinating generators—bringing them online when demand is high and gearing down when demand drops—by coordinating planned outages, and by ensuring extra generation is in place in case of an emergency.

Danger of congestion

The more congested the system becomes the harder it is to match the province's varying supply and demand needs. Congestion can manifest itself as stranded electricity supply that is effectively unavailable to the market, or as a lack of transmission capacity to serve local demand. Whatever the cause of the congestion, the result is the same: increased costs to the system and a higher price for electricity.

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How the AESO plans for an uncongested transmission system

The Government of Alberta's *Transmission Regulation* states that the transmission system must be built to effectively operate congestion-free. To meet this mandate, ongoing studies are conducted to assess the ability of the transmission system to accommodate existing and future generation supply and consumer demand. The results of these studies are published every two years. As part of this planning, the AESO identifies constraints or limitations to system access for customers and recommends when expansion or reinforcement to the transmission system is needed. Following these studies, the AESO files Needs Identification Documents that recommend necessary transmission development for approval with the Alberta Utilities Commission

The AESO has identified four Critical Transmission Infrastructure projects and over 200 regional projects—including customer connections—that will meet Alberta's current and future demand for power. The planned improvements will not only deliver the power Albertans rely on, but in many cases will control costs by reducing system inefficiencies.

Role of interties in achieving an uncongested transmission system

Interties are power lines that connect to other jurisdictions, providing an essential part of a reliable, competitive electricity industry. Interties allow Alberta to export surplus power to other jurisdictions when provincial supply exceeds demand and import power when it is economically advantageous to do so and when we are short of power. Alberta has been a net importer of electricity since 2002.

The province has two interties: one connecting to B.C. and the other to Saskatchewan. Current constraints on Alberta's transmission system mean these interties are operating below their designed capability. Increased congestion has resulted in times when those wishing to import or export power via the interties cannot do so. The transmission system needs to be reinforced to restore the capacity of existing interties and lay the foundation to develop additional interties in the future.

Albertans benefit from the ability to export power using interties since generators' access to external markets attracts more investment and increases competition. Having the ability to import power also allows for access to lower cost energy when it's available from other jurisdictions. In addition to supporting competition, interties encourage fair and efficient market development, enable construction of renewable energy such as wind power, and support increased reliability and supply adequacy.

Costs associated with an unconstrained transmission system

The AESO takes a prudent, practical and balanced approach to forecasting growth on the system, avoiding excessively optimistic forecasts that might lead to overbuilding transmission infrastructure, as well as overly pessimistic forecasts that fail to address infrastructure gaps, discourage investment and could have a negative impact on economic prosperity.