

Natural Resources

Ontario's looming electricity supply need

By Caroline Jageman and Michael Killeavy



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(August 10, 2022, 12:41 PM EDT) -- In December 2021, the Independent Electricity System Operator (IESO) released the Annual Planning Outlook, which forecasts the ability of Ontario's electricity system to meet the province's needs over the next 20 years (2023 to 2042). Somewhat worryingly, IESO projects that the system is insufficient to meet anticipated demand as soon as 2025.

After a decade of flat demand growth, the IESO forecasted annual net energy demand to grow at an almost two per cent per year over the outlook period. This dramatic growth is primarily attributed to electrification of the economy, e.g., expansion of the adoption of electric vehicles (EVs), steel producer electrification, as well as the expansion of the agricultural greenhouse sector, mining sector expansion and continued residential sector growth. The transportation sector demand outlook has the most significant impact on the demand outlook with an annual average growth rate of 20 per cent, which is due primarily to EV charging.



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Growing demand, coupled with the retirement of Pickering Nuclear Generation Station and other nuclear plant refurbishment outages, will require 4,000 megawatts and 6,000 megawatts of additional capacity by 2030, with a capacity need starting in 2025. Capacity measures the ability of generators to provide energy when needed. To put this in perspective, Ontario currently has about 41,500 megawatts of installed capacity, which has been built over many decades. The IESO forecast means that the province needs to add between 10 per cent to 14 per cent of its installed capacity in the next seven years. This will truly be a very significant undertaking.

The need is very acute. Every quarter the IESO produces a Reliability Outlook that assesses whether Ontario has adequate electricity to meet demand over the next 18 months. In June of this year, the Reliability Outlook indicates that there could be three weeks in the summer of 2023 where required electricity reserves fall short under normal weather conditions. An abnormally hot summer could make the situation worse. The IESO plans to deal with this situation by causing generators to reschedule outages for planned maintenance; however, this is really a stop-gap measure and can increase the likelihood of generators breakdown.

Lack of sufficient electricity supply can harm the Ontario economy by deterring investment. In May of this year, it was reported that LG Chem had abandoned a \$2.5-billion investment in a plant in Windsor because there was an insufficient supply of energy for it. Ironically, the plant would supply cathodes and other materials to the EV battery plant being constructed in Windsor by LG and Stellantis. The plant would have created 1,000 to 1,500 new jobs. LG would make investments, Windsor-Essex economy would get a boost, but it could not secure the power, a mere 15 megawatts. This is a very disappointing development for the Ontario economy and is perhaps likely a sign of things to come unless supply resources can be built out fast enough to meet growing demand.

The addition of supply resources, however, faces several challenges. Firstly, all this will be done against the backdrop of an electricity system that is entering the next phase of decarbonization. In October 2021 the minister of energy directed the IESO to evaluate a moratorium on new natural gas-

fired generation and to develop a pathway to zero emissions in the electricity sector. Unfortunately, Ontario has also had a checkered history of siting and developing new gas-fired generation, having had two plants relocated at considerable expense to mollify communities opposed to siting these plants in their communities. Given these circumstances, it is unlikely that new gas-fired plants will be added to meet the emerging supply need.

Secondly, the identified capacity needs begin to occur as soon as 2025. This compressed time frame severely limits the choices for acquiring new supply resources. Three years is not enough time to site and construct nuclear, hydropower or wind power facilities. In fact, in past wind projects took four years, or more, to come into service. Waterpower projects can even take longer, with seven to 10 years to come into service not being that unusual. Previously, these projects were developed under the permitting regime introduced by the *Green Energy and Green Economy Act, 2009*, which removed much local municipal control over siting projects. The Act was repealed in 2018 reinstating local municipal control, which could make siting projects more challenging than in the past. Nuclear projects need to go through an even lengthier and complex siting process.

Thirdly, it is anticipated that energy storage (batteries) and hybrid resources (batteries co-located with a generation resources), will play a major role in the initial procurement of supply. Currently, the IESO-administered markets do not cater to these types of resources. This creates a great deal of uncertainty for prospective developers, which may deter their enthusiasm for developing supply resources.

Fourthly, the IESO has initiated very time-consuming, rigid, procurement processes. The IESO has indicated a preference for these new supply resources to be in service as soon as possible to meet the emerging capacity need in 2025, and in any event no later by May 1, 2027. In late July the IESO announced that these processes were now delayed. This will mean that a lot of projects will need to be developed in a very short period, and the required in-service dates for new supply resources is a greater risk now.

Partially due to political uncertainty and past announcements by the IESO of it having a surplus of supply resources, very little large-scale project development has occurred in Ontario in the last decade, or so. This means that the supporting infrastructure required to develop these projects, connection assessments and environmental approvals, will need to be put into place and ramped up in a very short period of time.

This is also a very bad time to be in the market for supply resources. Inflation is rampant. For example, the price of lithium, a raw material used to construct batteries, has increased over 200 per cent since last autumn. Interest rates are high and climbing in response to inflationary pressures. Since last year at this time, yields on government of Canada long bonds have increased about 200 basis points. Supply chains are experiencing bottlenecks. Much of the equipment needed to develop new supply resources require long lead time to order and obtain, so supply chain bottlenecks mean that these lead times will be longer. These current risks are in addition to the risks always faced by project developers such as FOREX, construction risks and weather risks. In the past decade when the province had sufficient supply resources, the IESO wielded considerable leverage over generators. The tables have now turned on the IESO. All this means that the new supply resources will be very expensive.

Renewing and expanding Ontario's energy infrastructure never stops; however, the province is entering a phase of rapid acceleration against the backdrop of severe global uncertainty. It will take the concerted effort of many different parties to solve Ontario's electricity supply shortfall. The next few years also create an opportunity for innovative energy solutions and conservation approaches. We look forward to seeing how the province will rise to the challenge.

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