



Ontario's Energy Future

SPRING 2024 UPDATE

The Independent Electricity System Operator (IESO) balances Ontario's electricity grid to meet demand on a second-by-second basis. The IESO also forecasts system needs – both supply and transmission – years into the future to ensure electricity will continue to be available where and when it is needed.

The Electricity Transformation

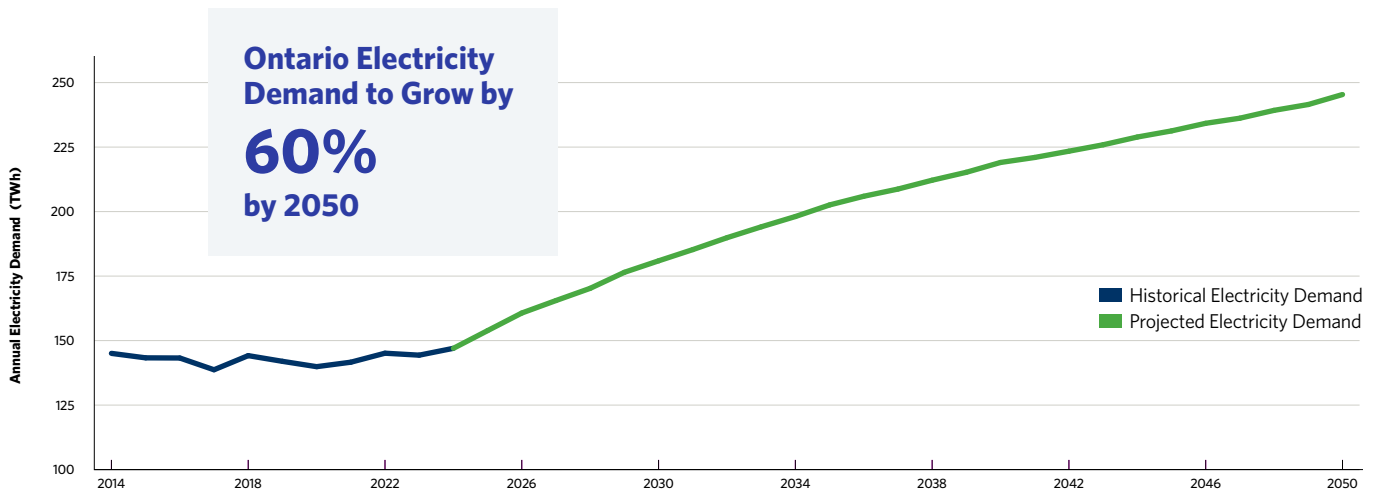
Ontario's electricity system has developed and evolved over the past 100 years as new supply was added to the grid, including hydro, coal, and nuclear – and in the last 20 years – natural gas, wind, solar, and storage. In the decades to come, significant changes are planned; almost every aspect of the power system will grow and transform at an unprecedented scope and pace.

To meet increasing demand for electricity and simultaneously reduce emissions from the grid, work is well underway to build more generation, upgrade the transmission system, integrate new technologies, and expand energy-efficiency programs.

Anticipating Future Energy Needs

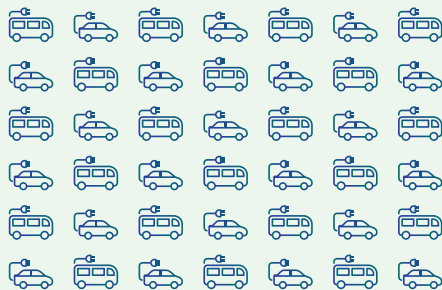
To identify how much supply is needed to meet future requirements, the IESO analyzes historic data, economic and population growth projections, and government policy changes to develop electricity demand forecasts. Based on current assessments, Ontario continues to show steady demand growth year over year at a rate of 2 per cent, with total demand expected to increase by 60 per cent over the next 25 years. While demand and consumption is forecast to increase, the way electricity is being consumed is also changing.

Today, electricity demand peaks in the summer months, largely driven by air conditioning demand. With an expanding agricultural and greenhouse sector, along with increasing electricity use for home heating and transportation, Ontario is expected to become dual peaking by 2030, with winter demand peaks catching up to summer peaks.



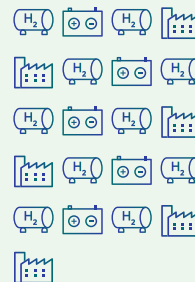
Forecasting Electricity Demand by Sector

As electricity demand rises - with some sectors increasing faster than others - Ontario must add new supply and expand transmission to accommodate population and economic growth as well as electrification.



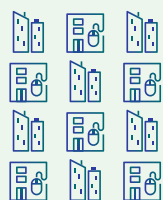
Transportation 42 TWh

Personal and fleet electric vehicles; public transit electrification including rail projects



Industrial 21 TWh

Battery manufacturing; hydrogen production; mining sector growth



Commercial 12 TWh

Continued shift to the digital economy; hybrid work-from-home; e-commerce



Residential 12 TWh

Housing policies; hybrid work-from-home; home heating electrification



Agricultural / Greenhouses 3 TWh

Increased artificial lighting in greenhouses

Each icon represents one terawatt-hour (TWh) of new electricity consumption that will be added to the grid by 2050.

Addressing Supply Needs

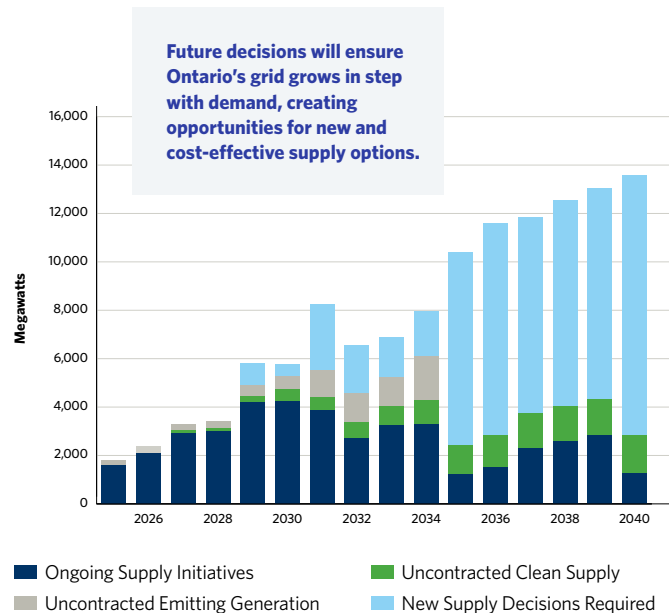
A variety of options are being deployed to secure enough supply to meet upcoming needs: from small-scale solar panels to help power local communities to the expansion of our robust nuclear fleet to serve the entire province.

Some ongoing initiatives to meet future needs include:

- Securing new non-emitting supply: wind, solar, hydro, and biofuels
- Undertaking Canada's largest storage procurement to complement wind and solar generation
- Exploring nuclear: new capacity at Bruce Power; refurbishing Pickering Nuclear Generating Station; building small modular reactors
- Signing a new capacity-sharing agreement with Hydro-Québec
- Expanding Save on Energy programs for residential and business consumers
- Leveraging community-based generation, storage and conservation and demand management programs

Ontario's Future Supply Needs

Significant progress has been made to meet Ontario's future electricity needs. Work continues, however, to secure capacity and energy to ensure a reliable, affordable and sustainable grid over the next 25 years.



Strengthening Transmission Capability

An expanded electricity transmission system is vital to supporting the energy transition. Ontario currently has more than 30,000 kilometres of high-voltage transmission lines that move power from electricity generators to the distribution networks that serve communities.

As more electricity is needed to support population and economic growth and meet increasing demand, the IESO is recommending transmission projects that will help areas that are underserved, where aging infrastructure needs to be replaced, and where demand will exceed existing capacity.

In doing so, the IESO continues to engage and work with businesses, residents, municipalities and Indigenous communities on regional electricity plans, with new lines proposed and being energized to serve growing local needs.

Remote Communities

Connecting First Nations communities, large mining operations, renewable generation and remote areas of northern Ontario.

Northern Ontario

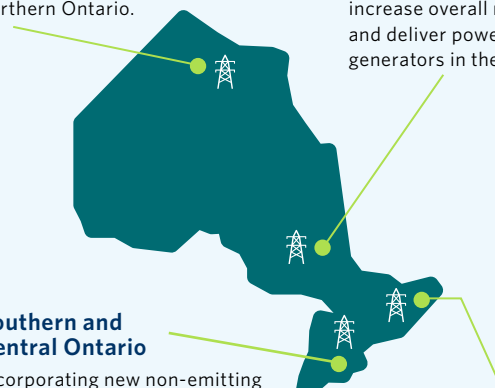
Exploring transmission expansion between Toronto and Sudbury to increase overall reliability and deliver power from generators in the north.

Southern and Central Ontario

Incorporating new non-emitting supply such as small modular reactors and storage; integrating potential Bruce Power expansions; enabling economic development and increasing supply to the Greater Toronto Area.

Eastern Ontario

Evaluating transmission equipment at end of life, support to Ottawa and other parts of eastern Ontario as well as import capacity with Quebec and New York.

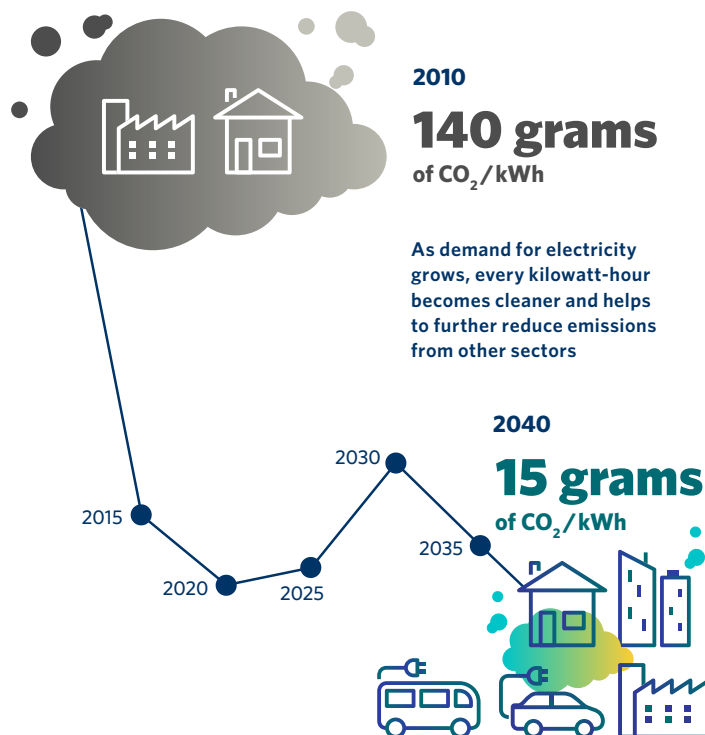


Decarbonizing the Grid

Today, Ontario residents and businesses benefit from a diverse and reliable mix of supply, with the vast majority of electricity produced by non-emitting generation. This variety provides a strong foundation to further decarbonize the system.

Ontario faces a dual challenge to meet increasing electricity demand while reducing reliance on natural gas supply, which is currently critical to maintaining the reliability of the grid. Natural gas currently plays a unique role to address supply shortfalls while nuclear refurbishments take place. IESO scenarios for an orderly phase-out of natural gas show that by the late 2030s natural gas will only be required as back-up to protect the system when reliability is most at risk.

Based on the IESO's forecasts, Ontario's clean energy advantage will improve before then. By the end of this decade, as demand grows and new non-emitting supply comes online, every kilowatt-hour created in Ontario becomes cleaner, reinforcing the value of electrification.



Getting Involved

The energy transition creates more opportunities for Ontario residents and businesses to become involved in their electricity system and our shared energy future—whether joining discussions about community energy planning, developing local energy projects, or using electricity more wisely day-to-day. As homes, businesses, and industries require more electricity to power more activities and processes, Ontario will need to ensure that its electricity system remains reliable, affordable, and sustainable.

For more information on the IESO's planning and procurement processes, visit ieso.ca/apo

For more information on decarbonization visit ieso.ca/decarbonization-hub

For more information on energy-saving programs and incentives, visit saveonenergy.ca

**Independent Electricity
System Operator**

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