



Hydro Ottawa ONTARIO'S ELECTRICITY SECTOR — An Overview



A leading, trusted, integrated utility services company

Ontario's electricity sector has a number of key players responsible for making electricity, transmitting it across the province, delivering it to customers' homes and businesses, directing overall operations, and overseeing the system.

THE SYSTEM OPERATOR

The Independent Electricity System Operator (IESO) connects all participants in Ontario's power system — generators that produce electricity, transmitters that send it across the province, retailers that buy and sell it, industries that use it in large quantities and local distribution companies that deliver it to homes and businesses.

The IESO forecasts electricity demand throughout the province every five minutes and collects offers from generators to provide the required amount of electricity to the province's electricity market. This allows customers buying directly from the market to see prices fluctuate based on supply and demand. As a result, they can shift consumption away from peaks in demand to times when the price is lower.

The IESO monitors the system, identifies what is required to maintain reliability in the future, and publishes its findings in regular reports. It also coordinates emergency preparedness for the province's electricity system.

ELECTRICITY GENERATION

Electricity is created by the province's generating stations — hydroelectric, nuclear, fossil-fueled, wind, biomass and biogas, and a small amount of solar power. Some of these (such as nuclear and large hydroelectric stations) operate

continuously; others operate intermittently (such as wind power), or can start up or slow down as required to follow demand fluctuations (such as natural gas stations and hydroelectric stations that store water).

Ontario Power Generation (OPG) is Ontario's largest generating company, with roughly half of Ontario's total generating capacity of more than 34,000 megawatts. Owned by the Province of Ontario, OPG has two nuclear stations, 65 hydroelectric stations, five fossil-fueled stations, and two wind turbines.

Bruce Power is the second largest generator, with 6,200 megawatts of nuclear capacity at two nuclear stations near the Bruce Peninsula.

There are many other smaller generating companies in Ontario, generating power using natural gas, water, and other renewable energy sources such as wind, solar, biomass and biogas (landfill gas). Hydro Ottawa, for example, has a fleet of smaller hydroelectric and landfill gas-to-energy generating stations.



Unlike other energy forms that can be stored (oil, natural gas, coal), electricity must be used as it is generated. That is because there are currently no economical ways to store large quantities of electricity for later use. Storage technologies such as large batteries could become economical in the future, but at this time electricity supply and demand must be kept in constant balance.

The prices that electricity generators receive are determined in various ways. Some facilities, such as the continuously-operated hydroelectric and nuclear stations of OPG, receive a regulated price for their generation that can change only after a regulatory hearing. Other facilities, such as Bruce Power's nuclear stations, and natural gas generating stations, negotiate a contracted price for their generation with the Ontario Power Authority. Still other generating stations receive the ever-fluctuating market price for electricity, in the IESO-managed electricity market.

ELECTRICITY TRANSMISSION

The electricity that Ontario generators produce is transmitted from generating stations to local distribution companies and large industrial customers through a high-voltage network of transformer stations, transmission towers and wires.

Hydro One owns 97 percent of Ontario's transmission grid, with almost 30,000 km of high-voltage transmission lines — one of the largest transmission grids in the world. It plans, constructs, operates and maintains the transmission network.

The company also owns and operates 26 interconnections with neighbouring provinces and states, which allows electricity to flow into and out of Ontario.

ELECTRICITY DISTRIBUTION

When the power reaches a city, town or rural area, it is distributed at lower voltages along distribution lines to our homes, businesses, hospitals, schools, factories, and farms by local distribution companies (LDCs).

LDCs deal directly with Ontario's electricity customers, maintain their community's system of electricity wires, and create and implement electricity conservation programs for customers. LDCs are the primary electricity billing agent in the province, collecting all electricity charges. Since electricity distribution accounts for only a relatively small percentage of the electricity bill of an LDC (about 20 percent of a Hydro Ottawa bill, for example), the balance of the bill payment is remitted to the other companies involved in the electricity sector.

The LDCs are both publicly and privately owned, with the majority municipally-owned (Hydro Ottawa being an example). They are regulated monopolies in their respective communities and service areas. The government, through the Ontario Energy Board, regulates the rates that distributors charge customers for the distribution service.



ELECTRICITY RETAILERS

While it is always an LDC that *delivers* electricity through its distribution lines to a home or business, Ontario electricity customers can choose from whom they *buy* electricity. Most Ontario customers choose to buy from their LDC. Customers can also choose to enter into a contract with an electricity retailer. There are a number of such retailers currently competing to sell power to electricity customers across Ontario.

PLANNING AND CONSERVATION

The Ontario Power Authority (OPA) is responsible for:

- > helping the province achieve a reduction in provincial electricity use;
- > planning for Ontario's long-term electricity supply reliability; and
- > ensuring that Ontario has a clean, modern and cost-effective power grid.

It achieves these objectives by coordinating province-wide electricity conservation efforts, planning the electricity system for the long term, and contracting with electricity generators for clean electricity resources.



REGULATION

The Ontario Energy Board regulates the province's electricity and natural gas sectors in the public interest. Specific responsibilities in the electricity sector include:

- > issuing codes, rules and guidelines for regulated entities to follow in their operations;
- > licensing and oversight of market participants including generators, marketers and retailers;
- > monitoring and enforcing compliance with regulations;
- > approving and setting delivery rates for electricity distribution and transmission;
- > approving facilities, including those for the transmission of electricity;
- > setting the price of electricity for certain consumers under the Regulated Price Plan and time-of-use plan;
- > reviewing and setting regulatory policy; and
- > approving amalgamations, acquisitions, divestitures and mergers of regulated entities.

ELECTRICAL SAFETY

The role of the Electrical Safety Authority (ESA) is to improve electrical safety in Ontario.

The ESA is responsible for administering specific regulations related to the Ontario Electrical Safety Code, licensing Electrical Contractors and Master Electricians, electricity distribution system safety, and electrical products safety. The ESA also works with stakeholders throughout the province to educate, train, promote and foster electrical safety.

PROVINCIAL ELECTRICITY POLICY

The Ontario Ministry of Energy establishes energy policy for the province, and is focused on ensuring that Ontario's electricity system functions at the highest level of reliability and productivity.

The Ministry's major responsibilities include:

- > developing the energy policy framework for Ontario, within which energy market participants and regulators operate;
- > promoting the development of a safe, reliable, secure and environmentally-sustainable energy supply for Ontario; and
- > promoting energy conservation.

Sources: Websites of the IESO, OPG, Bruce Power, Hydro One, Electricity Distributors Association, OPA, OEB, Ontario Ministry of Energy.

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