

Ontario Realty Corporation



- ▶ 3305 kW of natural gas-fired cogeneration
- ▶ Four government buildings
- ▶ Reduced greenhouse emissions
- ▶ Ontario, Canada

Ontario Government Chooses Cogeneration to Save Energy

After enduring a massive 2003 power blackout that affected 50 million people in Ontario and eight U.S. states, the Canadian province embraced ambitious new efforts to reduce its electricity demand.

Because of this and other factors such as aging generating plants, the Ontario government challenged the public to reduce energy consumption by 10 percent. The goal was to reduce peak energy use in the province by 6,300 MW by 2025, with interim energy-saving goals of 1,350 MW by 2007 and an additional 1,350 MW by 2010.

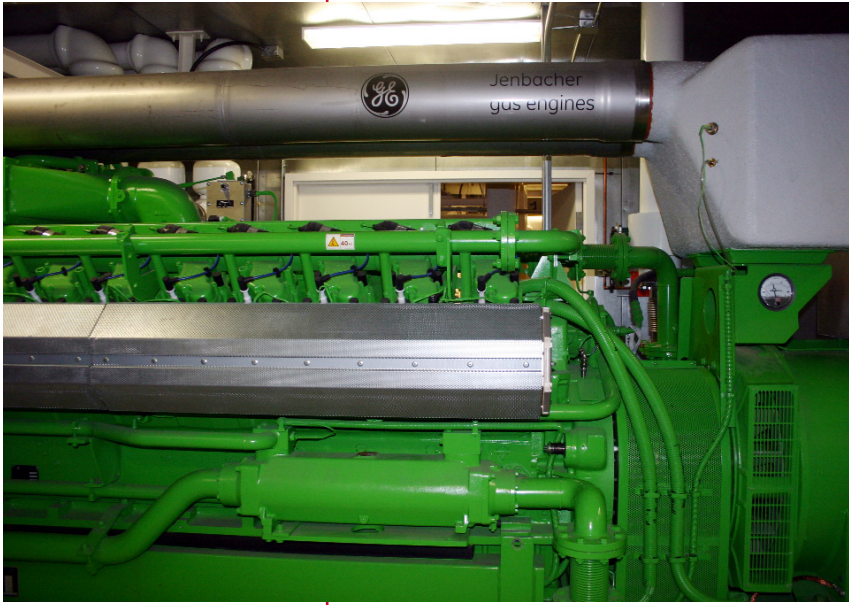
Cogeneration was one of several measures selected by Ontario's provincial government to meet the same goal, in order to lead by example. The Ontario Realty Corporation (ORC), which manages the provincial government's real estate portfolio, was assigned the task of reducing energy consumption in government buildings by 10% from the base year of 2002-2003, according to Jim Butticci, a spokesman for ORC. The ORC met that target and exceeded it.

Of its 6,000-building portfolio, ORC selected those buildings for which cogeneration would be most economically feasible, considering factors such as size and a continuous or long electrical and thermal load. ORC's cogeneration installations also require a centralized building utility system, rather than one in which electrical service, boilers and cooling equipment are located in different areas of the building.

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ORC's Project Manager Bruce Jackson, Regional Director of Operations Bruce Lawrence, and Asset Manager Gary Sirove combined to develop the in-house ORC expertise to implement small-scale embedded cogen plants in Ontario facilities. To help finance the projects, they made use of some federal funding as well as grants and support from Union Gas Ltd., a key distributor of natural gas in Ontario.

One of their objectives was to minimize greenhouse gas emissions. The inherent efficiency of CHP reduces carbon dioxide emissions significantly compared to conventionally sourced power and heat. In addition, for each cogeneration system, ORC specified selective catalytic reduction equipment that will significantly reduce nitrous oxide, carbon monoxide and other greenhouse gases from the generator

exhaust. Emissions are to be less than 0.075 grams per brake horsepower per hour (g/bhp-hr) of nitrous oxide, and less than 0.150 g/bhp-hr of carbon monoxide.

Four cogeneration sites

ORC chose four sites for cogeneration:

- The Ontario Police College, 10716 Hacienda Road, Aylmer, ON
- The Ontario Government Building, One Stone Road, Guelph, ON
- The Laboratory Services Building, 95 Stone Road, Guelph, ON
- The Ontario Provincial Police General Headquarters, Lincoln M. Alexander Building, 777 Memorial Avenue, Orillia, ON

The four projects are expected to cost a total CAN\$11 million, with a return on investment (ROI) of 8 to 10 years. The Ontario Police College cogeneration system was commissioned in 2007, and the other three will be online later this year.

The first project in operation is the 500,000-sq.-ft. Ontario Police College, a facility for training police officers. Its 850-kW natural gas-fired GE-Jenbacher reciprocating engine cogeneration plant supplies electricity as well as heat that is used for domestic hot water, space heating, and cooling with a 130-ton Thermax-USA absorption chiller.

The Ontario Government Building at One Stone Road is a 556,468-sq.-ft. office building with two five-story towers and underground parking, connected by an atrium. The building's electricity will be produced with a 1060 kW natural gas-fired GE-Jenbacher reciprocating engine system. Exhaust heat from the generator will preheat domestic hot water and supply space heating in winter. Summer space cooling will be supplied by a 172-ton absorption chiller from York-Johnson Controls. This project is expected to reduce energy costs by CAN\$180,000 annually, and will be commissioned later this year.

Constructed in 1996, the One Stone Road building has won several awards from the Toronto chapter of the Building Owners and Managers Association (BOMA) of Canada.

The neighboring Laboratory Services Building, with 150,000 sq. ft. of space, will be served by a 335-kW GE-Jenbacher reciprocating engine system. Heat from power generation will be used for space and process heating.





Round-the-clock critical power

Cogeneration will not only reduce energy costs, but also supply critical back-up power to keep the Ontario Provincial Police General Headquarters in Orillia operating around-the-clock during emergencies.

“They need to be in operation 24/7, and they need a reliable source of continuous power in the event of emergency or blackout,” says Butticci.

A natural gas-fired GE-Jenbacher reciprocating engine cogeneration system will supply 1060 kW of power for the 600,000-sq.-ft. police headquarters. Heat from the unit will supply space heating, and a York-Johnson Controls absorption chiller will use some of the thermal energy for space cooling.

Built in 1995, the facility serves as headquarters for the police of Ontario’s Central Region and houses the Provincial Police Academy and Ontario Provincial Police Museum. The building earned BOMA Go Green Plus[®] environmental certification, as did One Stone Road. The Go Green initiative is intended to make buildings healthier for occupants, while reducing greenhouse gas emissions along with energy and water consumption, cutting operating costs and improving waste management.

ORC also plans a cogeneration system for the Elgin-Middlesex Detention Centre near London. Design is underway for two 335-kW cogeneration units, which will also supplement the emergency power requirements of that facility.



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