

**CASE STUDY**

# McMaster University

## Leads the Way in Innovative Electricity Grid Initiative

McMaster University is one of Canada's oldest and most prestigious public research universities, founded in 1887 and located in Hamilton, Ontario. McMaster believes in the importance of sustainability and environmental leadership, offering courses like the Sustainable Future Program, in which students develop specific green projects. The university is committed to reducing its energy consumption, implementing energy initiatives and promoting energy efficiency. In 2005, McMaster was the first university in Ontario to develop a sustainability policy and since 2008, has saved over \$8 million through its energy improvement and sustainability initiatives.

**BACKGROUND**

The Independent Electricity System Operator (IESO) works at the heart of Ontario's power system, balancing supply and demand through the electricity market, and managing the reliability of the provincial power grid. With a view to integrating new demand management and storage technologies into the power system, the IESO took a major step forward by selecting new suppliers of regulation service, a grid-balancing function traditionally provided by generators. Generac Grid Services (formerly Enbala) was chosen to provide its technology platform to respond to the

needs of the power system through an automated, real-time grid balancing network, through which the IESO, Generac Grid Services and McMaster University worked together on Ontario's first highly innovative Grid Balance® initiative which engaged the province's commercial, industrial and institutional organizations.

**THE PLATFORM EXPLAINED**

McMaster is a progressive leader in the educational sector, investing in innovative technologies that enhance their campus and have a positive environmental impact. An integral part of

the university's energy improvement strategy involved working with Generac Grid Services' real-time demand management platform. The platform seamlessly and intelligently enables time-shift power usage in real time to match the moment-to-moment fluctuations of electricity demand on Ontario's power system.

## HOW THE PLATFORM IS BEING USED AT MCMASTER

The platform is connecting to five chillers with a 16,000 ton cooling capacity – a part of the university's HVAC (heating, ventilation and air conditioning) system. These chillers have flexibility in their power usage, and Generac Grid Services engineers worked closely with McMaster to determine the operating parameters necessary to keep campus buildings at a comfortable temperature. The next step was the installation of a local communications panel (LCP) and metering at the site.

The team then worked with McMaster's trusted contractors to program the building management system (BMS) connected to the chillers. This was followed by comprehensive testing using a

simulated IESO signal to ensure that platform's response stayed within the set temperature parameters. With the implementation complete, McMaster's BMS operator can view a screenshot of the platform's activities in real time as it works to keep electricity generation and demand in balance. The platform receives real-time requests (or signals) from the IESO which are then sent to McMaster's BMS, which automatically adjusts the chillers' output without any noticeable impact on daily operations.

## Summary of Benefits Achieved by McMaster

In working with Generac Grid Services, McMaster is achieving a number of benefits, such as:

- Leveraging existing energy-consuming assets as "dual-use" in an automated, cost-free program
- Generating a new revenue stream that can be applied against their energy initiatives and/or operating costs
- Real-time visibility into operating processes
- Contributing to reduced greenhouse gas emissions in Ontario
- Contributing to the reliability and sustainability of the province's power system
- Recognized as a leader in innovation within the educational sector

