

Solar Turbines®

A Caterpillar Company

COGENERATION PROJECT

Queen's University

Design/Build:

Solar Turbines Canada Ltd.

Detail Project Engineering:

Gryphon International

Construction: E.S. Fox

Location: Kingston, Ontario, Canada

Installed: 2006



The predominant heating and cooling design favored by universities worldwide is the "district" approach, in which multiple buildings are supplied chilled water and heat from a central plant. Cogeneration systems are capable of providing not only heating and cooling, but power as well. And capitalizing on the benefits of cogeneration, the new plant will be more efficient than the combination of the older plant and the local electrical utility.

Queen's University in Ontario recognized this opportunity and renovated their existing central heating plant using two 7.5 MW *Taurus*™ 70 generator sets, heat recovery steam generators (HRSG's), new motor control centers, electrical switchgear, and a new connection to the local utility.

The system produces up to 15 MW of power, as well as 150,000 lbs/hr of 275 psi

saturated steam. In terms of emissions reductions over the older boilers and electric utility system, the project reduced NOx emissions by 75% and CO₂ by 31%, or 57,000 tons per year. This is the equivalent of taking almost 10,000 cars off the road or the carbon dioxide absorbed by 15,500 acres of forest.

Installing the plant posed challenges, as the central heating plant was a historic masonry structure located in an environmentally sensitive area. Solar Turbines Canada Ltd. supplied not only the turbine generator sets, but performed project engineering, procurement, and construction services. Project criteria included designing for high reliability in base load operation, while meeting high overall cycle efficiency. In addition, the cogeneration system had to meet stringent air emissions and noise requirements.

In order to keep the campus running in the event the local utility is lost, the cogeneration system is designed to transfer to island mode operation. Gas turbines work well in this mode, because they have the ability to change load rapidly when system demand changes.

Solar Turbines Incorporated is a wholly-owned subsidiary of Caterpillar Inc., a world leader in the design, manufacture, installation and operation of power generation equipment.

For more information on this project and how Solar Turbines can provide a sustainable, effective solution to meet your energy needs, contact:

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