Technology
Monitoring
Best Practices

SolarCity Partnership

Toronto Water

86.4 kW Building-Integrated Photovoltaic System

Project Overview
Project Owner: Toronto Water
Location: 201 Copperfield Road, Toronto
Building Type and Use: F.J. Horgan Water Treatment Plant
System Type: Grid connected, Building-Integrated PV
System Power Rating: 86.4 kW
Installation Date: October 2009
Installer: Solar Integrated

System Configuration
System Surface Area: 1,913 m^2
Number of Modules: 120
Module Manufacturer: Solar Integrated
Module Wattage: 720 W
Module Model: SI-G1 720
Inverter Manufacturer: Satcon
Inverter Model: PVS-100 (480V)
Number of Inverters: 1
Array Slope: 0
Azimuth: 10 degrees
String Configuration: 2 modules in series to form a source circuit. Number of parallel strings: 60 source circuits

Annual Performance
Estimated: 83,214* kWh

Financial
System Cost: $1,050,000
Annual Income: $59,332**
Cost per kW:$12,153
Simple payback (before grants): 17.7

Environmental Benefits
Estimated emission reduction: 15.6 tonnes eCO_2 /yr***

BACKGROUND
Toronto Water had to replace the roof on a building at the F.J. Horgan Water Treatment Plant. Various types of green initiatives such as maintenance free vegetated assemblies, a white roof, and photovoltaic (PV) systems were considered and evaluated.

The roof structure did not possess the structural capability to support a vegetated green roof design or a conventional PV system.

Toronto Water chose to install a roof with a building integrated 86 kW photovoltaic system – the first of its kind in Canada – to both serve as a roof and a power generator. Installed in October 2009, the project was designed to take advantage of the Ontario Power Authority's Feed-in Tariff (FIT) program and showcase Toronto Water's commitment to sustainability.

MONITORING
A web-based performance monitoring system is installed that measures PV system status and power production. A weather station on site records numerous environmental parameters including solar irradiance, wind speed and direction, ambient temperature, rainfall level, humidity/dew point, and barometric pressure.

FINANCIAL
The project was funded entirely by Toronto Water. The system will pay for itself in approximately 17.7 years and continue generating clean electricity for years after.

STATUS
Grid connection has been delayed due to changes in FIT metering requirements. The necessary changes have been completed and the project is awaiting final FIT contract approval, which is anticipated in early 2012.

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* Based on RETScreen analysis of two months of actual production
**Based on FIT rate of 71.3 ¢/kWh
***Based on 0.187 kg eCO_2/kWh

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