



BACKGROUND

Wilmar Court is a non-profit seniors' residence located in Toronto and owned by Wilmar Heights United Church Non-Profit Homes Inc. In November 2009, a 37 kW_t solar domestic hot water (SDHW) system was installed on site. The system preheats the building's domestic hot water using energy from the sun, reducing the need for conventional natural gas water heating. The goals of this project were to assess the technical and financial viability of SDHW systems and educate Wilmar Court residents and employees about the benefits of renewable energy technologies. The project also serves as a model for other community organizations looking to implement similar initiatives.

MONITORING

A BTU meter tracks energy production, and a web-based monitoring system enables in-depth performance monitoring.

FINANCIAL

The system was installed at a cost of \$141,147. The project received \$13,600 from both Natural Resources Canada and the province, and \$46,000 from the Canada-China Economic & Cultural Centre. Based on post-retrofit system performance, the system will achieve a simple payback of 89 years before grants and 43 years after. Payback would have been considerably more favourable had the system continued to perform at pre-retrofit levels. These results highlight the importance of ensuring that all key operational parameters are thoroughly investigated during the feasibility assessment phase of the project.

STATUS

The system underwent a retrofit midway through the monitoring period. Although post-retrofit performance has decreased, the system continues to perform above RETScreen simulations incorporating measured hot water usage and temperature.

For more information, contact:

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Wilmar Court

37 kW_t Solar Thermal Installation



Project overview

Project owner: Wilmar Court
Location: 967 Pharmacy Avenue, Toronto, ON
Building type and use: Seniors' non-profit housing
System type: Solar thermal (evacuated tube)
System power rating: 37 kW_t
Installation date: November 2009
Installer: Globe Solar Energy, Inc.

System configuration

System aperture area: 53.52 m²
Collector manufacturer: Globe Solar Energy, Inc.
Collector model: GSE IP-195
Number of collectors: 24
Solar storage volume: 150 L per collector (3,600 L total)
Collector fluid: Water
Array angle: 45° from horizontal
Array azimuth: 13° East of South

Annual performance

2010-11 Actual: 54,821 kWh (1,463 kWh/kW_t)
2010-11 Modified RETScreen: 30,300 kWh (809 kWh/kW_t)
2011-12 Actual: 33,406 kWh (892 kWh/kW_t)¹
2011-12 Modified RETScreen: 29,200 kWh (779 kWh/kW_t)

Financial

Installed system cost (including tax): \$141,147
Grants: \$73,200
Cost per kW_t (excluding external funding): \$3,768
2011-2012 Annual cost savings: \$1,583²
Simple payback (excluding external funding): 89.2 years

Environmental benefits

Estimated emission reduction: 8.5 tonnes eCO₂ /yr³

¹ Includes 2 months of extrapolated data (Sep - Nov 2011)

² Based on a natural gas price of \$0.35/m³

³ Based on 1.879 kg eCO₂/m³

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