

Partners for Climate Protection

Greenhouse Gas Reduction Initiative of the Month

Greater Sudbury Housing Corporation: Solar Wall Installations



Municipal Profile

Population: 157,857

PCP Member since: 1997

Background

The Greater Sudbury Housing Corporation (GSHC) is a non-profit organization that manages more than 280 public housing buildings on behalf of its sole shareholder, the City of Greater Sudbury.¹ About 40% of the units managed are high-rise apartment buildings. In 2007, the GSHC was faced with the need to reduce energy consumption at its largest building, a 17-storey apartment complex on Bruce Street. After reviewing a variety of ideas, the GSHC approached Conserval Engineering, a Toronto-based company, to custom-design a SolarWall® as the best solution.

Implementation and Approach

A SolarWall® is a simple yet effective way to reduce heating costs and can be installed on new or existing buildings. At the Bruce Street complex, built in 1972, eight panels (569 m² in total) were affixed to the south-facing exterior (*pictured at right. Photo courtesy of the GSHC*). The panels are mounted several centimetres out from the main wall, creating an air cavity. The solar cladding is perforated with tiny holes and, as ambient air passes through it, it absorbs the heat from the sun. The heat is then drawn through the cavity up into the building's ventilation system through two fresh air intakes on the roof. At night, the wall acts as a giant heat exchanger with the heat loss from the exterior wall brought back into the building via the ventilation system.



Conserval supplied the materials, engineering and drawings for the wall, while local contractors performed the installation.

The GSHC receives a capital allowance of \$2.5 million annually from the city, but installing a SolarWall® at the Bruce Street complex would have meant dipping into that allowance, leaving less money for other building operation and maintenance costs. "We applied for and obtained three grants – the federal government's ecoENERGY program and the Province of Ontario's Solar Thermal Heating Incentive and Northern Ontario Heritage Fund Corporation – which covered 75% of the total cost, which was \$180,000," says Richard Munn, GSHC's manager of technical services. "The remaining \$50,000 was covered by our capital budget."

A second installation was done two years later on an 11-storey building at a cost of \$190,000. Once again, funding grants covered the majority of the costs, with the GSHC paying about \$60,000 out of its capital budget.

¹ Two city councilors sit as members of the GSHC Board of Directors.

Results

Annual savings at the Bruce Street building are between \$20,000 and \$25,000, based on 2007 natural gas prices, and GHG reductions are about 186 tonnes. “The SolarWall is paying for itself,” says Munn, noting that the first installation has a capital budget payback period of only two to three years. The second installation on Paris Street has a payback of about five years.

“What we really like about it is that there’s not a lot of intervention required,” says Munn. “There are not a lot of moving parts. It’s not a complicated system, it’s just a hollow black box that heats the air up and goes into our regular air system.” In extremely cold weather, the SolarWall does not completely eliminate the need for a back-up heating system, but on a -15C day (Sudbury’s average winter temperature is around -12C), the system provides a 25-30C bump-up of warm air drawn inside.



The City of Greater Sudbury installed a similar solar wall on its water treatment plant and its sewage treatment facility in 2008 and is enjoying the same benefits as the GSHC has seen with its solar installations (pictured at left. Photo courtesy of the City of Greater Sudbury).

Lessons Learned

For other municipalities that may be considering a similar initiative, a solar wall is a relatively inexpensive but highly efficient way to capture and use solar energy. Building orientation is key. “These two buildings faced south, so it was an easy decision to use solar,” says Munn. He also reports that the GSHC faced no significant challenges with the installation. “The only really onerous process was working with the grant applications,” he says. “Luckily, we had an energy consultant who was familiar with the process.”

Future Direction

The GSHC is now in the process of installing four large solar photovoltaic (PV) systems on four of its apartment buildings. Three of the systems will provide 30 kW of electricity, one will provide 60 kW. Capital funding is being provided through Ontario’s Social Housing Renovation and Retrofit Program, while the Province of Ontario’s feed-in tariff will buy the power produced from the PV systems.

Further Information

Richard Munn, Manager, Technical Services
Greater Sudbury Housing Corporation
Sudbury, ON
(705) 674-5175 ext. 228
rmunn@sudburyhousing.org

The Partners for Climate Protection (PCP) program is a network of Canadian municipal governments that have committed to reducing greenhouse gases and acting on climate change. PCP is the Canadian component of ICLEI’s Cities for Climate Protection network, which involves more than 900 communities worldwide. PCP is a partnership between the Federation of Canadian Municipalities (FCM) and ICLEI – Local Governments for Sustainability. PCP receives financial support from FCM’s Green Municipal Fund.