

Partners for Climate Protection

Greenhouse Gas Reduction Initiative of the Month

Kimble Drive Solar Installation



Municipal Profile

Population: 50,535

PCP Member since 2001

In September 2009, the Federation of Canadian Municipalities (FCM) named the City of Fredericton a national leader in the Partners for Climate Protection (PCP) program, making Fredericton one of only four Canadian cities to achieve the highest level of program requirements for greenhouse gas measurement and reduction in municipal operations.

Background

Since 2000, the City of Fredericton has applied an aggressive retrofit policy to all its municipal buildings. Between 2000 and 2004, the greenhouse gas (GHG) emissions associated with these buildings decreased by 20.5 per cent, despite the addition of several new buildings and facilities. The city has estimated that its policy to retrofit older buildings and build energy-efficient new ones could further reduce GHG emissions by about 1,115 tonnes.

As part of this process, the city's property services division has been removing oil-fired boilers, furnaces and water heaters from many of its buildings and replacing them with natural gas-fired water appliances.

"The city is very keen on energy savings and reducing its carbon footprint," says Jihad Elzamer, the city's energy analyst, noting that by adding a solar thermal system to natural gas-fired heating, the city will not only save money but also reduce GHG emissions.

Implementation and Approach

City council approved the entire project, which included replacing the oil-fired boilers and water heater with a natural gas-fired system and installing a domestic hot water solar thermal system at the Kimble Drive fire station.

A solar hot water system is generally composed of solar thermal collectors, a fluid system that moves heat from the collectors to a storage tank. For the Kimble Drive fire station, the system consists of two solar panels, located on the roof, which connect to a holding tank (pictured at right, photos courtesy of the City of Fredericton), which in turn feeds a natural gas-fired water heater. Other than a licensed plumber to install the system, no other work was required, and the system was installed and working within two weeks.

"The natural gas heater gets its 'cold supply' from the solar holding tank, so that if the water in the solar tank is at the set point — say 65°C — the natural gas heater does not fire up," explains Mr. Elzamer. "If the temperature of the water is less than 65°C, then the natural gas heater kicks in to bring the water temperature to the set point."



Results



Photos courtesy of City of Fredericton

With virtually no maintenance required to the solar thermal system, and no special training required for fire department staff, this project is definitely a win-win for the city.

Costs totalled \$17,823 (\$10,000 for the natural gas heater and \$7,823 for the solar thermal system), and annual savings are estimated to be \$3,385 for a simple payback of about five years. Annual GHG reductions are estimated to be 14 tonnes.

Lessons Learned

Mr. Elzamer reports that there were no problems installing the system, nor have there been any issues with its operation since it was installed in January 2009. "I advise other municipalities to use solar thermal where possible," he says. "It's green energy, and the operating and maintenance costs are minimal."

As part of the city's wider-ranging building policy, Mr. Elzamer also advises municipalities to take a holistic view of its municipal building portfolio to include not just buildings but interior, exterior and traffic lighting, appliances (furnaces, boilers, etc.), and control systems, such as building management systems, in order to capture the most savings. He also recommends that municipal governments take advantage of programs available from other levels of government; for example, the City of Fredericton is participating in a *Building Labelling Pilot*, launched by Natural Resources Canada, which establishes energy benchmarking for commercial and institutional buildings.

Future Direction

The city is planning a major upgrade to the Kimble Drive station's digital control system to monitor and control the operation of its heating, ventilation and air conditioning system.

Additional solar heating systems are also planned for other city buildings, particularly for the city's fire and police stations.

Further Information

Jihad Elzamer
City of Fredericton Energy Analyst
Tel: 506-460-2169

Jihad.Elzamer@Fredericton.ca

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 (CCP) 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.