

Partners for Climate Protection

Greenhouse Gas Reduction Initiative of the Month



John Brother MacDonald Stadium heat recovery

Municipal Profile

Population: 9,455
 PCP Member since: 1998

Background

Since joining PCP in 1998, the Town of New Glasgow, Nova Scotia, has made a commitment to reduce energy and GHG emissions at both the corporate and community levels. New Glasgow is now implementing its local action plan, which calls for energy-efficient retrofits to many of its existing buildings, including the 60-year-old John Brother MacDonald Stadium (pictured at right, courtesy of the Town of New Glasgow), which received a new boiler, ceiling insulation and temperature sensors six years ago. This project takes New Glasgow a step further by reusing waste heat from the stadium's refrigeration process to heat the dressing rooms and pre-heat water for flooding the ice rink.



Implementation and Approach

New Glasgow chose the ECO CHILL® ice plant heat recovery system to capture and reuse waste heat at the John Brother MacDonald Stadium. Heat is captured from the stadium's refrigeration process (used to make ice) and then run through a heat exchanger (pictured at left, courtesy of the Town of New Glasgow). The heat is then stored in water storage tanks (pictured at right, courtesy of the Town of New Glasgow) and is used to pre-heat water for flooding the rink. A second lead from the heat exchanger heats a water storage tank that is tied to an in-floor radiant heating system in the dressing rooms.



Bob Funke, recently retired town engineer and now project manager for several New Glasgow infrastructure projects, notes that the town waited until the technology had matured sufficiently to make it economically viable. "We had lowered the heating costs from retrofits done six years ago but we needed a better payback if we were to install heat recovery,"



says Funke.

The heat recovery system began operating in January 2010 and the town expects the payback period to be about 10 years.

A local labour shortage delayed the project somewhat. "There was a construction boom on at the time so we had difficulty finding adequate contractors," says Funke. CIMCO, the makers of the ECO CHILL system, installed the heat recovery portion and municipal staff performed the majority of the labour. "Staff ran all the insulated conduits around the perimeter of the stadium, cleaned out the rooms and poured the floors. It brought our budget down significantly."

Results

The heat recovery project cuts annual GHG emissions by about 153 tonnes and saves the town about \$22,000 a year in heating energy costs, although Scott Cooke, the stadium's chief operator, notes that this is a conservative amount based on the first four months of operation. "Not only do we reduce the amount of heating oil, the more we use the system, the less electricity we use in the compressors to cool down the ammonia in the refrigeration system," he says.

The project cost approximately \$300,000, about half of which was provided through a grant from the Province of Nova Scotia's EcoTrust program.

Lessons Learned

Cooke explains that one of the challenges the town faced was initially getting the temperatures on the condensers right. "When CIMCO first adjusted the system, the temperatures were too high, so I needed to adjust that until I was confident that we were in the right range and that none of our equipment would be affected in a negative way, while still getting the maximum output from the heat recovery."

He also notes that on very cold days, the temperatures in the dressing rooms may need to be augmented by the oil-fired boiler, which is kept as a backup in case there is a breakdown in the heat recovery system.

Mike Adam, the stadium's manager, says that arenas are the perfect type of building for heat recovery systems. "A typical arena produces enough waste heat to heat about 30–60 homes, so if you can use waste heat to offset costs, either to the building or to another partner, it's win-win." The stadium's system is designed so that any extra waste heat can be used to heat other buildings in the future.

Adam also recommends that although specialized expertise is required to install these types of systems, municipalities looking to do similar projects must "speak the same language as the manufacturer. At the end of the day, the design engineer comes in, does the work, then leaves so you need to have that knowledge transfer so that you can manage the system," he says. "That really helps municipal staff to take ownership of the system, embrace the changes and find even more ways to reduce energy and costs."

Future Direction

The expertise the town developed during this project will be put to work in some of its future initiatives, notably wind energy. "We built the concrete floors for the stadium, so there's nothing to stop us from building the base for a wind turbine," says Funke. The town is also adding a wind turbine to its water treatment facility, one of the first municipalities to do so, but Funke notes that, "whatever we do we always try to maximize energy reduction first, then look at renewables."

Further Information

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Download a copy of the town's action plan at:

http://www.sustainablecommunities.fcm.ca/files/capacity_building_-_pcp/pcp_members_inventory_action_plans/newglasgow-action-plan.pdf

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.