

## Partners for Climate Protection

### Greenhouse Gas Reduction Initiative of the Month

#### Halifax's Mini-Hybrid Bus System



#### Municipal Profile

Population: 390,096

PCP Member since 1997

The Halifax Regional Municipality (HRM) was one of the first Canadian municipalities to complete all five PCP Corporate milestones, and is one of only two cities in Atlantic Canada to achieve this (the City of Fredericton has also met Corporate Milestone 5).

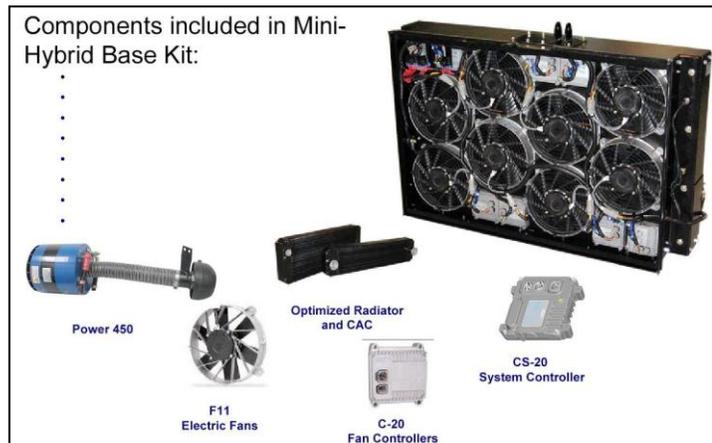
#### Background

As part of its inventory of energy use and GHG emissions in 2005, HRM determined that fleet vehicles were responsible for about 8,500 tonnes of emissions each year. To reduce emissions from fleet vehicles, HRM has implemented a number of measures, including an anti-idling program, the use of biodiesel, and a fleet policy aimed at downsizing or right-sizing its fleet. This project involved replacing the traditional hydraulic-fan system in HRM's Metro Transit buses with a slide-in, controllable electric-fan package.

#### Implementation and Approach

Richard MacLellan, HRM's Manager of Energy and Environment, Planning and Infrastructure, says "We had been studying different opportunities for a number of years, and had seen a lot of 'snake oil' offerings. When we learned about a new product that would replace the hydraulic-fan system in our buses with an electrical system, staff took a critical look at it."

Engineered Machined Products Inc. manufactures the mini-hybrid (MH8) thermal unit, which replaces a vehicle's traditional mechanical fan with an electric-only fan system. The MH8 is electronically controlled to cool charged air and engine coolant separately. It operates independently of engine speed and control, making it capable of providing full-load cooling, even when the engine is idling. On average, the MH8 cuts fuel consumption by about 10%.



*Pictured above: The MH8 kit comes with everything necessary to replace a hydraulic-fan system, including a diagnostic light for easy detection of problems. The MH8 draws only 5–6 HP, but provides up to an additional 50 HP at the wheel. In addition, by replacing the mechanical components (pump, fan, etc.), the MH8 represents a 300-pound weight saving over a conventional, hydraulic cooling system, meaning that buses are lighter and use less fuel. Graphic supplied by Halifax Regional Municipality.*

HRM staff reviewed the results of similar retrofit projects in Montreal and Vancouver, and within a few other transit organizations. HRM staff reports show that the mini-hybrid system has been tested and installed in 32 North American cities. “The technology was proven, so we decided to try it for our buses,” MacLellan explains. Council approved the purchase of three initial units in early 2010.

“Initially we changed three units, and found it wasn’t a difficult retrofit at all. We timed the retrofits with a maintenance project, and our vendor replaced the hydraulic cooling system as part of their scheduled maintenance, so we didn’t have any disruptions in transit service.” HRM then monitored fuel savings before and after installation. Fuel savings were estimated because fuel use varies, depending on the particular bus route. Once staff were satisfied with the results, Fleet Services applied for and received a provincial EcoTrust grant to purchase additional units, and HRM made up the difference in total purchase costs.

## Results

Twenty transit buses have now been retrofitted with the mini-hybrid fan package. Total implementation cost for the first 12 buses was \$308,050, \$101,825 of which was provided by the EcoTrust grant. Each unit costs \$26,100 and, on a per-bus basis, annual fuel savings are 3,800 litres (a savings of approximately \$2,470); annual maintenance cost savings are \$2,000; and GHG emission reductions are nine tonnes. Total savings for the first 12 buses are approximately \$54,000, with a payback period of approximately 5.7 years.

“The buses are quieter, so there’s less noise in the community,” says MacLennan, “and there are additional safety benefits—because there have been incidents of hydraulic fires—so we’ve removed that risk as well.”

## Lessons Learned

Other than finding the necessary financing, MacLellan says that the project went off without a hitch. “For other municipalities that are interested, they should just do it; it’s a really easy project,” he says. “There is minimal downtime to complete a retrofit—particularly if it’s part of regular, planned maintenance—and drivers didn’t need any additional training.”

## Future Directions

MacLellan says that an additional 80 to 100 buses are now ready to be retrofitted. “We need money to do that, and are now seeking the financing and putting together a plan,” he says, “but we’re expecting that a large-scale retrofit project will start next fiscal year.” HRM’s Fleet Services is also working with its bus manufacturer to see if the mini-hybrid system can be installed during the build of articulated buses that are currently on order.

In addition, HRM is looking into a number of other fleet initiatives through its partnership with Clean Nova Scotia (CNS), a non-profit group that works with a number of stakeholders to improve the environment. HRM has signed a partnership agreement with CNS, whereby the municipality will contribute \$50,000 to be used to leverage additional funding for fleet-reduction projects.

MacLellan says that HRM is assessing driver-training opportunities and other technological initiatives as well. One of these involves installing a separate electrical power supply, which would enable drivers to run communications and other electrically powered equipment without idling the engine.

## Further Information

Richard MacLellan  
Manager, Sustainable Environment Management Office,  
Infrastructure and Asset Management  
Halifax Regional Municipality  
902-490-6056  
[maclelri@halifax.ca](mailto:maclelri@halifax.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 1,200 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.



FEDERATION  
OF CANADIAN  
MUNICIPALITIES

FÉDÉRATION  
CANADIENNE DES  
MUNICIPALITÉS

