

Partners for Climate Protection

Greenhouse-Gas Reduction Initiative of the Month

Halifax Streetlight-Conversion Program



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 of the PCP Corporate Milestones, and is one of only two cities in Atlantic Canada to attain that level (Fredericton has also met Corporate Milestone 5). As part of its corporate action plan, the city has implemented a number of energy-efficiency initiatives, including energy retrofits to several of its municipal facilities, the use of solar and geothermal power as heat sources for community and recreational centres, and the capture and use of landfill gas to generate electricity that is added to the provincial grid.

Background

In 2011, the Province of Nova Scotia introduced legislation that required the use of light-emitting-diode (LED) technology for all roadway lighting in the province, making it the first province or state in North America to do so. HRM was already ahead of the game in this case, as its program to replace streetlighting began in 2005. Of the almost 40,000 streetlights in Halifax, about 38,000 still need replacing, and HRM plans to replace them over the next five to ten years.

Implementation and Approach

Angus Doyle, HRM's Utilities Coordination Manager, explained that the city's streetlight conversion program began several years ago with a pilot project developed by a local supplier. This gave HRM exposure to the LED technology and its associated benefits, and resulted in HRM initiating a streetlight project to convert 2,100 existing streetlights to LED.

HRM applied for and received a combined \$1.6 million from the Province of Nova Scotia's EcoTrust (which ended March 2011) and Efficiency Nova Scotia programs. "This represented about 60% of the funding for the streetlight replacements," said Doyle. "It made it a much more economical business case for us, and made it very easy to get permission from Regional Council to proceed."

HRM did not have any LED-lighting expertise within the municipality. "We relied on lighting suppliers to help us understand the technology, minimum standards and various features of the fixtures," said Doyle. "It was a steep learning curve for staff." HRM put out a Request for Proposals for the procurement of 2,100 LED streetlights in June 2010, and received seven bids. The supply contract was awarded to Nova Scotia-based LED Roadway Inc.

The LED streetlights were installed over a six-month period between October 2010 and April 2011. Seventy-watt, 100-watt, 150-watt and 250-watt high-pressure sodium (HPS) fixtures were replaced with 48-watt, 72-watt and 96-watt LED full cut-off fixtures.



Pictured at left, one of the new style of streetlights. Photo courtesy of the Halifax Regional Municipality.

On average, LED streetlights consume approximately 55% less energy, last up to 15 years longer than conventional lamps, and contain no mercury, which alleviates hazardous waste disposal issues.

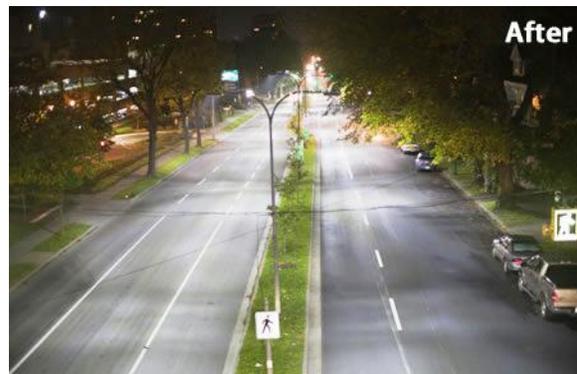
Results

Cost savings from converting streetlights to LEDs are averaging about \$150,000 annually, giving the entire program a simple payback of about 5.6 years. Savings also reflect lower maintenance costs over the expected 20-year life of the LED fixtures. GHG emission reductions are in the order of about 3,100 tonnes per year.

Doyle said that the full cut-off fixture design emits far less light pollution and is “dark-sky compliant,” meeting a standard set of lighting protocols developed by the International Dark Sky Association.

Community reaction to the conversion project has generally been positive, although some residents prefer the softer yellow light produced by HPS lamps. The full cut-off fixture design also limits side light, which some residents view as producing less light. HRM has, however, received a number of positive comments from staff and the general public, and considers the conversion project to have widespread acceptance.

Pictured at right: a roadway after and before the retrofit. Photo courtesy of LED Roadway.



Complementing this project, Doyle highlighted HRM's six-year traffic-signal system conversion program. Between 2005 and 2011, all 266 intersections with traffic signals were converted from incandescent lamps to LED lamps. This \$2-million project was supported, in part, by the provincial government's LED Traffic Signal Assistance Program, and Efficiency Nova Scotia's Commercial and Industrial Custom Electrical Efficiency Program. HRM is saving about \$250,000 annually in energy costs from this initiative, and Doyle noted that operating costs are also significantly lower, due to the longer-lived LED lamps.

Lessons Learned

As noted above, Doyle said that one of the challenges that HRM faced was the fact that, at the time, streetlights were a relatively new application of LED technology, and HRM lacked specific LED-lighting expertise. “We have learned a lot about LED streetlights as a result of our conversion project, and it also puts us in a good position as we prepare for future initiatives,” he said. “In addition, with 2,500 LED streetlights in operation across the urban core, staff is beginning to develop a better understanding of maintenance expectations. Over the past year of operation, for example, replacements have been in the 0.5% range.”

Doyle said that there is a business case to be made for municipalities considering converting to LED streetlights. “The cost savings can be significant, but economic viability depends upon the extended life of the lights and minimal maintenance,” he explained. “Right now, most LED suppliers anticipate a 20-year life; but since the operating history of the fixtures is limited to two or three years, there is a level of uncertainty associated with long-term operating costs.” That being said, Doyle noted that there will likely be improvements to the technology and price reductions in the future, which could further improve the LED-streetlight business case.

Future Directions

As noted previously, the province has now legislated that existing streetlights must be replaced with LEDs. Once implementation regulations are released by the province, HRM will develop a plan for the conversion of approximately 38,000 streetlights. This is anticipated to cost in the order of \$30 million, and will likely take five to ten years to complete. Once the conversion is completed, HRM expects to realize annual energy-cost savings of about \$1.6 million, as well as 2,000 tonnes of GHG emission reductions each year.

Another major energy/environmental initiative underway within the HRM is the Solar City project: an \$8.5-million community solar pilot program encouraging individual homeowners to install solar panels for heating domestic hot water. HRM will finance the equipment purchase and installation, and qualified homeowners will pay back the municipality as a supplement on their tax bill (approximately \$500–600/year). HRM estimates that most homeowners will pay off the panels within ten years.

Further Information

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For more information on Halifax’s energy-efficiency initiatives, please visit
<http://www.halifax.ca/environment/EnergyEfficiencyInitiatives.html>

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 1200 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.



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