

Partners for Climate Protection

Greenhouse Gas Reduction Initiative of the Month

Energy-efficient lighting at Edmonton's LRT stations



Municipal Profile

Population: 937,845

PCP Member since 1995

Edmonton city council approved its Greenhouse Gas Emissions (GHG) Reduction Plan for City Operations in October 1999. The plan includes emission reduction initiatives in all areas of the city including buildings, street lighting, municipal and transit fleet improvements and wastewater processing. A long-standing member of PCP, Edmonton was one of the first two cities (along with Calgary) to reach PCP Milestone 5.

Background

An initial energy assessment of several light rail transit (LRT) stations was conducted in May 2000.

As part of a group of lighting upgrades to several LRT stations, the city upgraded the lighting at the Grandin station, as well as its mechanical control and temperature systems.

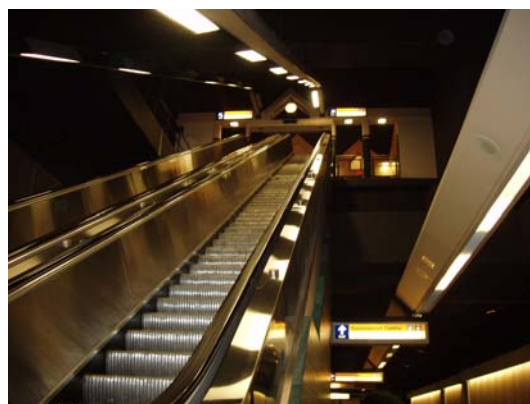
Implementation and Approach

The Grandin station's overhead lighting was upgraded from T12 fluorescents to T8 bulbs. In addition to being more energy efficient, T8 bulbs provide a higher level of light output. Light-emitting diodes (LED) were used for signage and areas that require more directed light.

The engineering firm that conducted the initial energy assessment also designed the lighting and recommended the use of T8 bulbs and mechanical controls to reduce energy use and GHG emissions.

At the same time, the city also installed new electrical and mechanical systems to reduce the station's overnight temperature and to run motion sensors to shut lights off when the station was not in use.

To avoid interruptions to the city's transit services, all the upgrade work was done at night.



*Grandin Light Rail Station.
Photo courtesy of City of Edmonton.*

Results

The city invested approximately \$63,500 in new lighting and mechanical control systems. With annual savings of about \$41,500, the project has a simple payback of 1.5 years and annual GHG reductions of 459 tonnes or 610,887kWh.

Randall Colgan, of the city's Buildings Design & Construction department, notes that because T8 bulbs have a longer lifespan, maintenance costs to replace bulbs will be decreased. "The light quality is also better, which makes things safer," he says.

Lessons Learned

The city found that simply replacing lighting with higher-efficiency models was only one part of the solution. "The new temperature and lighting controls are also important to reduce energy use and we can use that knowledge in other projects," says Mr. Colgan, adding that motion detectors are now being used in the snack machines at City Hall to reduce energy.

He also noted that installing new mechanical systems can be more expensive than simply upgrading lamps. "They have a longer payback and can increase the design costs," he says. "Municipalities should merge mechanical and electrical upgrades so that the payback is still within an acceptable timeframe."

Future Direction

Edmonton adopted a policy of building to the Leadership in Energy and Environmental Design (LEED) Silver standard in January 2008. All new LRT stations will be built with the same kind of high-efficiency lighting used in this initiative.

One of the city's newest LEED Silver buildings is the Meadows fire station in the Mill Woods area. A solar PV array mounted on the station's roof generates more than enough electricity to run the facility, so the city sells the surplus back to the grid.

Further Information

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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™ (www.fcm.ca/gmf).