

Partners for Climate Protection

Greenhouse Gas Reduction Initiative of the Month

North Vancouver Lonsdale Energy Corporation



Municipal Profile

Population: 45,165

PCP Member since: April 2002

Background

The City of North Vancouver, British Columbia, established the Lonsdale Energy Corporation (LEC) in 2003. The corporation was designed to create a district energy system* that would heat and supply domestic hot water to residential, municipal and commercial buildings.

LEC is a key component of the city's local action plan. Also launched in 2003, the plan aims to cut corporate emissions by 20 per cent and community emissions by six per cent, by 2010, compared to 1995 levels.

A feasibility study, partially funded by the Federation of Canadian Municipalities' (FCM's) Green Municipal Fund, was conducted in 2002. The study found that a central energy plant would have been more efficient to provide heat and hot water locally. However, the city's plan to phase in development in the Lonsdale area would allow several mini-plants to be built over several years, ensuring a steady stream of customers.

This project focuses on the connection of city hall and the library to the existing LEC system.

**District energy systems use hot water or steam from one or more centralized locations to heat several buildings via an underground network of insulated piping. Heat exchangers in each building connect to the centralized system.*

Implementation and Approach

As of April 2010, the LEC system consisted of five mini-plants. Each plant extracts heat from natural gas-fired boilers to heat water for the system. The boilers also capture exhaust heat, which is then condensed as steam. The plants recapture up to 95 per cent of that energy. City hall and the library were connected to mini-plant four in the fall of 2009.

Part of the City of North Vancouver's plan was to build a new library – designed to accommodate solar panels on the roof. The city obtained \$204,000 in funding from the Canada-BC Municipal Rural Infrastructure Fund and the EcoEnergy for Renewable Heat Program, to add 120 solar collectors to the library roof. These collectors provide supplemental heating to the LEC system.

Glenn Stainton, LEC's vice-president of operations and the city's facilities manager, says that much of the pipeline network for the LEC system was already in place. As a result, the cost to connect each building was relatively low and dependent on the heating capacity required. "We only needed to add a heat exchanger and energy transfer stations, which is standard in all connected buildings," he says.



The North Vancouver public library has the most solar collectors of any building in B.C. Photo courtesy of the City of North Vancouver.

“Mechanical design professionals did the connection design for the projects,” says Stainton, “but it was valuable that we already had a high level of in-house expertise with regard to the building control systems and tools used in our heating system.”

Results



*Adding to the LEC pipeline network.
Photo courtesy of the City of North Vancouver.*

Connecting City Hall and the library to the LEC system will reduce emissions by approximately 33 tonnes per year and save more than 650 gigajoules of natural gas.

The entire LEC system serves a network of 22 buildings, including 1,785 residential units (approximately 158,000 metres square). These buildings used to be heated using inefficient electric baseboards. Eliminating this fossil-fuel generated electricity has reduced nitrous oxide emissions by 64 per cent and CO₂ emissions by 21 per cent.

Other benefits accrue to developers. By connecting their buildings to the system, they can avoid installing a separate boiler system. This frees up valuable building space for other purposes. Building owners also avoid ongoing operations and maintenance of their boiler systems and their eventual capital replacement. Connecting to the system also ensures benefits as alternative energy systems are added to the LEC network.

Lessons Learned

According to Stainton, connecting city hall and the new library to the district energy system was relatively straightforward. “City Hall was a classic retrofit of an older property,” says Stainton. “So we did need to make some changes in order to get the system to work effectively with the existing building.”

For municipalities considering district energy as part of their overall plan to reduce energy costs and greenhouse gas (GHG) emissions, Stainton offers this advice: “Just get started. Quit studying the concept.” He says that by phasing in the LEC system, the city is able to add GHG-reducing technologies, such as the solar array on the library, as they become available.

Future Direction

The LEC system has been extended to include the entire city, not just the Lonsdale area. “Any new redevelopment project greater than 1,000 m² has to be connected to the system,” says Stainton. A sixth mini-plant is now being planned that will use additional renewable energy technologies.

North Vancouver has also developed a 100-year plan, in partnership with the University of British Columbia’s Design Centre for Sustainability. The plan aims to make the city carbon neutral by 2107, the city’s 200th anniversary.

Further Information

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See the April 2010 *GHG Reduction Initiative of the Month* that profiles North Vancouver's core building lighting retrofits: http://gmf.fcm.ca/files/Capacity_Building_-_PCP/PCP-GHG_initiative_of_the_month/2010/N-Vancouver-building-lighting-retrofits-EN.pdf.

Download a copy of North Vancouver's local action plan at:

www.cnv.org/c//DATA/3/496/GREENHOUSE%20GAS%20LOCAL%20ACTION%20PLAN.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.