

Partners for Climate Protection

Greenhouse Gas Reduction Initiative of the Month



City of Nanaimo and Regional District of Nanaimo: Electric Vehicles

Municipal Profiles

City of Nanaimo Population: 83,810/Regional District of Nanaimo Population: 146,574

Both municipalities have been PCP Members since 2002.

Under separate projects, both the City of Nanaimo and the Regional District of Nanaimo have purchased electric vehicles for their fleet operations in recent years, and have installed charging stations for use by municipal fleet vehicles and residents alike. This article describes the rationale behind the purchases, as well as anticipated results in both municipalities.

Background

As a member of PCP, and as a signatory to the Province of BC's Climate Action Charter, the **Regional District of Nanaimo** made a commitment to reduce carbon emissions in municipal and community operations. As part of the province's carbon tax, local BC governments receive rebates on the taxes they pay on emissions under the Climate Action Revenue Incentive Program (CARIP). "There are no formal requirements concerning what we can do with the money once it's rebated, so we established a reserve fund to invest in high-efficiency equipment, including vehicles," says Chris Midgley, the District's Manager of Energy and Sustainability. "We are rebated about \$50,000 to \$60,000 in carbon taxes each year, and some of that money has been used to offset the incremental cost of new electric vehicles [which can be up to \$30,000 more expensive than a conventional gas-powered vehicle]."

As part of its commitment to sustainability, the **City of Nanaimo** is currently working on its Transportation Master Plan (TMP), which will become part of the city's Official Community Plan. Under the TMP, the City has committed to greening its fleet, including the use of more efficient vehicles. "We look at all vehicles as they come up for replacement, and look for opportunities to downsize or go to alternative fuels, including electricity," says Bruce Labelle, the City's Fleet Manager. "The electric option doesn't meet all the fleet needs today; but as technology improves and more options are available, we hope electrics will become a substantial part of the City fleet."

Implementation and Approach

Regional District of Nanaimo

The Regional District began researching electric vehicles as part of its participation in an electric-vehicle working group, run by the Fraser Basin Council. The group studies a variety of issues related to electric vehicles, including technology, policy, and charging-infrastructure needs. "We hear from the Council when a given vehicle is available," explains Midgley, "and when those vehicles come up, we evaluate whether we have an opportunity within our fleet."

The District investigated several electric models and chose the Nissan LEAF. "We needed a vehicle that could do a few short trips every day (about 15 km), and the LEAF was an ideal vehicle for that purpose," says Midgley. The LEAF model offers a range of about 120–220 kilometres on a single charge.

The LEAF is used by Regional District of Nanaimo bus drivers. "When a bus driver finishes his or her shift, the bus driver coming on-shift drives the LEAF out, and the driver who is now off-shift drives it back," Midgley says.

In addition, the District installed a charging station, at a cost of about \$1,200, which was also paid for out of the reserve fund.

"The reserve fund alleviated the concerns of managers about making these types of purchases," says Midgley. "If our fleet department needs a vehicle and they have a budget for it, we can bring extra money to the table to buy an EV."

City of Nanaimo

Like the Regional District, the City of Nanaimo chose the Nissan LEAF because it fit the needs of the fleet in terms of size and driving range. "We had three cars coming up for replacement, and thought that the Nissan LEAF might be a good fit," says Labelle. "We looked at how many kilometres our current vehicles drove, and found that the LEAF worked very well."

Labelle explains that his department prepared a business case for the vehicles. "We had to make sure that purchasing them made sense financially, and it did. We determined that, once the vehicles' 10-year lifecycle is over, we'll be ahead financially, and there will be reductions in GHG emissions."

Between 2011 and 2012, the City bought three Nissan LEAFs. Two are used by Development Services personnel, while the third is used by Bylaw Services staff, and all municipal drivers of the electric vehicles underwent in-house training. The cars are serviced by a local Nissan dealership. "Nissan is committed to seeing these cars succeed, and will be closely monitoring them," says Labelle.

Four public charging stations were installed at three locations for use by the City's electric vehicles, as well as by residents who own electric vehicles. "This shows leadership within our community, and I get calls all the time from the public, often from Vancouver or Victoria, inquiring about charging stations," says Labelle. Recently, for example, he received a call from someone who wanted to travel to Whistler, and wanted to make sure there was an opportunity to charge their vehicle in Nanaimo.



The Nissan LEAF offers a range of about 120–220 km on a single charge. Photo courtesy of the City of Nanaimo.



Left: One of the public charging stations in the City of Nanaimo.

Right: The City's municipal fleet-charging station.

Photos courtesy of the City of Nanaimo.



Results

Regional District of Nanaimo

Total implementation costs ran to approximately \$40,000, and the District expects that GHG emissions will be reduced by about four tonnes annually. The emissions and fuel (electricity) costs of the vehicle are reduced by about 90% compared to traditional vehicles. “We didn’t do a complex payback analysis on this vehicle,” explains Midgley. “We saw this more as a transitional vehicle; we wanted to be early adopters. Although we paid more for them, we know a lot more about them now, and are contributing to the growth of the industry.” Midgley adds that the District’s transit crew usually logs about 20,000 kilometres per year; with a gas-powered vehicle, that would translate into about 2,000 litres of gas. The LEAF is expected to be used in the District for about five years.

City of Nanaimo

The city has estimated annual GHG reductions to be about 80% less, compared to traditional gas-powered vehicles. The three electric vehicles are expected to save the City about \$25,000 in fuel, maintenance and GHG emission reductions over their 10-year lifecycle.

Lessons Learned

Regional District of Nanaimo

Midgley says that, to date, there have been no obstacles to the purchase or operation of the vehicles. “We’ll have to evaluate maintenance issues over time, but Nissan has suggested that the cars require less maintenance and no oil changes. There are fewer moving parts, and we’re not worried about how they will function in winter,” he says. “If I were in another part of the country, however, I might be more concerned, as performance does diminish in winter, and heaters are a draw on the battery.”

Midgley recommends that other local governments considering a similar purchase should carefully consider their fleet needs. “If trip lengths are less than 20 kilometres, electric vehicles make sense,” he says. “You need to know the kinds of trips your employees make, because you can’t have a vehicle fail on them. Don’t buy it just to have it.”

He says that the optimal time to consider an electric vehicle is when a fleet vehicle needs replacing. “You need unanimity among council and staff before you try it,” he says. “Accept that a pilot test may not work out perfectly, so treat it as a way to evaluate the vehicle and what its limits are. In the end, you may be better off with a high-efficiency diesel model.”

City of Nanaimo

Labelle says that the biggest challenge the City has faced to date has been educating those who feel that electric vehicles are a “flash in the pan or that the City should not be involved in public charging stations. It’s an ongoing challenge, as I continue to get calls and e-mails on this issue.” He says that some public education on the issues would likely have helped “sell” the idea to the public. However, even given some public push-back, Labelle says that he would still purchase the LEAF today. “It’s a good fit within our fleet, and this is currently the car to beat among the other electric vehicles on the market.”

Labelle suggests that municipal officials interested in a similar program should test-drive all available electric vehicles on the market to make sure they know what they’re getting into. “They need to involve their users in the decision, so that you get buy-in. That makes the new cars a positive rather than a negative experience,” he says, noting that the more people you have on board, the more advocates you have to help spread the word. “I would also advise them to be sure that the charging infrastructure and chargers are in place before the cars arrive,” he says.

Future Directions

Regional District of Nanaimo

Aside from the Nissan LEAF, the District also owns some Honda hybrid gas-electric vehicles. The beauty of these vehicles, says Midgley, is that there is no range limit on hybrids. “Some of our employees—inspectors or bylaw officers—use these vehicles to make trips to Victoria or to the other end of the District, which could be up to 200 kilometres or more in one day, so those vehicles are better suited to that type of driving.”

Other projects on which the District is working include a solid-waste management program that has resulted in a 70% diversion rate, and aims to achieve zero waste. “The next step will be to look at opportunities to use residual or organic waste for energy,” says Midgley. “We’re in the final stages of creating a combined heat and power plant at one of our pollution control centres that will provide heat for the centre, as well as electricity that can be sent to the grid.”

City of Nanaimo



The City has also purchased two new dual-fuel (compressed natural gas [CNG] and gasoline) trucks to be used by its Water Department as utility vehicles. “Ford partnered with a company called PowerFuels, and these dual-fuel systems are fully integrated, not like a typical aftermarket add-on system,” says Labelle. “We have also purchased two CNG-compression stations to refuel the trucks inside our City Public Works

compound. Because both these trucks are heavy fuel-users, we anticipate that the two units combined will save us approximately \$100,000 in fuel costs, based on today’s prices, over their 10-year lifecycle.”

The Fleet Department also converted a Ford Ranger to electric in its own municipal auto shop. “We purchased a used 2007 Ranger, and stripped out the internal-combustion components,” says Labelle. “We then purchased a kit from a local supplier and built our own electric truck.” The truck is used by the City’s water supply department, and is expected to save about \$6,000 over the truck’s 10-year lifecycle.

Further Information

Chris Midgley
Manager, Energy and Sustainability
Regional District of Nanaimo
cmidgley@rdn.bc.ca

Bruce Labelle
Fleet Manager
City of Nanaimo, BC
Bruce.LaBelle@nanaimo.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.