



Cogeneration hinges on fuel prices and partner viability

Town of Berwick, Nova Scotia

Green Municipal Fund Case Study



Berwick Electric Commission Cogeneration Feasibility Study (GMEF 5554)

Date project completed: July 2004

Total project value: \$21,000

GMF grant: \$10,500

- Town investigates building plant to produce electricity and steam efficiently
- Lack of urban density challenges the use of cogeneration
- Partner's commercial viability reduces project feasibility
- Public sector partners and biomass fuel may offer more potential

PROJECT TEAM

Berwick Electric Commission
Neill and Gunter Ltd. (Nova Scotia)
Larsen Packers

CONTEXT "We are always looking for ways to lower utility costs and help customers," says Don Regan, electric superintendent at the Berwick Electric Commission. Cogeneration was seen as an efficient way to generate electricity because the waste heat byproduct would also be used. The commission is a town-owned utility serving the 2,500 residents of Berwick and the surrounding area. The utility has a hydro dam in Factorydale that produces about eight per cent of the electricity distributed to its customers. The rest of the power sold by the commission is purchased from Nova Scotia Power. The commission consists of the mayor, one town councillor, two members of the public, the superintendent and the town clerk.

APPROACH Initially, two industrial locations were considered for a combined heat and power

Berwick investigated building a cogeneration plant to supply waste heat for steam generation to Larsen Packers, a subsidiary of Maple Leaf Foods (Photo: Berwick Electric Commission).

OVERVIEW The Berwick Electric Commission, in partnership with Larsen Packers, a subsidiary of Maple Leaf Foods, studied the feasibility of building a combined heat and power plant, using existing cogeneration knowledge and technology on a smaller scale than is typical. Excess electricity from the plant would be sold to the provincial grid, while waste heat would be supplied to Larsen for steam generation. The goal was to see whether this cogeneration project could help the town become more energy self-sufficient and also deliver lower energy costs to industry and residents while reducing greenhouse gas (GHG) emissions. Fuel sources were found to be too expensive for the project to be feasible.



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cogeneration plant – Larsen Packers and Avon Foods. Avon Foods decided to close its Berwick plant and was dropped from the study. The study began with a survey of Larsen. Larsen then participated in an energy audit.

Fuel costs and the range of fuels to be considered to power the cogeneration plant were central to the study. Capital, operations, maintenance and administration costs for the cogeneration plant were factored into the study as well. The project team also tried to quantify the financial benefit of selling CO₂ credits. But the most important cost consideration turned out to be the financial viability of the main cogeneration customer, Larsen.

RESULTS A cogeneration plant would reduce GHG emissions by 11,000 tonnes per year and potentially create some jobs in Berwick. However, given the scattered distribution of the town's few industrial plants and large buildings, a central cogeneration facility to serve a small number of customers was not seen to be viable. Larsen was identified as the only viable customer.

The capital costs of building a cogeneration plant were estimated at \$11 million, to be paid back through sales of electricity and waste heat over the project's 20-year proposed lifetime. The maximum sale value of electricity to the provincial grid was projected at 7¢ per kilowatt hour in July 2004. At this price, and for the small scale of the plant being considered, the fuel sources examined in the study — natural gas, light fuel oil, heavy fuel oil and biomass — were too expensive to produce electricity for resale.

The study concluded that if the project could generate CO₂ credits at \$10 per tonne, it would potentially make the project viable, especially if heavy fuel oil were used. But the market for CO₂ credits was still too underdeveloped in Canada at the time of the study for the commission to take advantage of this idea.

NEXT STEPS Berwick will not be proceeding with a cogeneration plant. But it will apply some of the

lessons learned during the feasibility study to focus on biomass as a fuel source for other projects.

LESSONS LEARNED One of the most important lessons the commission learned during the study was that any potential partners must be thoroughly vetted first. "The commercial risk around working with the Larsen's plant was too great. We should have designed the study to take commercial risk with partners into account," says Regan. He suggested that one way the study could have been improved would have been to include a more stable public institution that is not subject to the same concerns about financial viability.

Regan also notes that not enough work was done to investigate biomass as a fuel source. More research could have been done into the benefits of tapping into local sources of biomass. On the other hand, using biomass as a fuel would mean the cogeneration plant would use a steam boiler, which requires an engineer to be on duty at all times. These and other variables were not built into the study's business case.

CONTACTS

Project contact

Don Regan
Electric Superintendent
Berwick Electric Commission
Tel.: 902-538-4744
E-mail: dregan@town.berwick.ns.ca

General contact

Town of Berwick
Administration
Tel.: 902-538-8068

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About the Green Municipal Fund

The Government of Canada endowed the Federation of Canadian Municipalities (FCM) with \$550 million to establish the Green Municipal Fund (GMF). The Fund provides low-interest loans and grants, builds capacity, and shares knowledge to support municipal governments and their partners in developing communities that are more environmentally, socially and economically sustainable.