



# Revelstoke studies using waste wood for district energy

Revelstoke, British Columbia

## Green Municipal Fund Case Study



Steel pipes were installed as part of Revelstoke's district heat system. (Photo: Revelstoke Community Energy Corp.).

### Heat Only Concept Study, Revelstoke Community Energy Project (GMEF 5156)

Date project completed: September 2003

Total project value: \$30,000

GMF grant: \$13,000

- Revelstoke studied a district energy system to produce heat for lumber kilns and some community buildings
- The system would use wood residues as fuel, replacing propane used in the kilns and cutting 3,200 tonnes of greenhouse gas emissions per year
- Capital costs were estimated to be \$4.9 million; with funding, the payback period would be about 10 years
- The project was deemed feasible, and Revelstoke had it up and running by 2005

**OVERVIEW** The City of Revelstoke studied whether a district energy system could fuel Downie Timber's lumber-drying kilns — replacing propane — and also heat several buildings in the community. District energy systems are a way of generating and distributing energy locally. They supply multiple buildings from a central source. By using sawmill wood residues — a local, renewable “waste” fuel — to generate heat, the district energy system would cut consumption of fossil fuels. It would also reduce air pollution from a silo burner used to dispose of the wood waste. Buildings in town, including a high school, arena and community centre, could be heated via the district energy system. The study showed that the system was feasible. Capital costs were estimated to be \$4.9 million.

The study team calculated that payback within 10 years was possible, with federal and provincial funding. Greenhouse gas emissions would fall by 3,200 tonnes per year. The city built the plant and installed piping for the district heat system, and operations began in June 2005.

### PROJECT TEAM

City of Revelstoke  
FVB Energy Inc.

**CONTEXT** Located on the Trans-Canada Highway in the scenic Kootenay Rockies region, Revelstoke has a population of 8,100. Transportation, forestry and tourism are mainstays of the city's economy. The Downie Timber company used propane to fire its lumber-drying kilns in the city and disposed of its wood residues in a large silo burner. In 2002, to reduce air pollution and find a



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more sustainable way to operate the kilns, the city conducted a study to see if a district energy system could produce heat and electricity using wood residue from the sawmill (GMEF 2316). This sophisticated district energy system proved feasible but too expensive, so in early 2003 the city decided to study the feasibility of a heat-only system.

**APPROACH** The city hired FVB Energy of Edmonton to conduct the study. The question was whether a district energy system could efficiently use wood residues (primarily bark) from Downie Timber's sawmill to fuel its kilns and pipe heat via hot water to nine buildings connected to the system. These buildings were specific prospective customers, including a high school and a proposed new indoor pool complex.

The study team looked at fuel requirements for the kilns and the nine buildings. Then they looked at the supply of wood residues to see whether the system could meet the energy demand.

They calculated fuel and operating costs for both the kilns and the serviced buildings to see whether the system could offer savings over the status quo.

Next, the team considered what type of equipment and plant would be best, at the lowest capital and operating costs. They developed cash flow projections to determine how feasible the project might be.

**RESULTS** The study team concluded that the project was feasible.

The district energy system could provide 85 per cent of the energy for the kilns and 95 per cent for the buildings. Only 10 per cent of Downie Timber's wood residues would be needed for the system. The rest would need to be trucked out of town. Downie would pay a disposal fee for the residues the system uses; this was factored into the financial analysis.

The plant would be situated next to the kilns. It would have a latest-generation 1.5 megawatt biomass-fuelled boiler and would generate heat in the form of low-pressure steam (for the kilns) and low-pressure hot water (to transport heat to the buildings).

Capital costs for the system were estimated to be \$4.9 million. The study team estimated that payback within 10 years was possible, with federal and provincial government funding. The estimated annual operating cost for the plant was \$140,000.

Greenhouse gas emissions would be cut by 3,200 tonnes per year. Without the incineration of wood residues in the silo burner, the city would reduce its air pollution. The trucking out of wood waste could be an environmental concern, however.

**NEXT STEPS** The report recommended developing a marketing strategy, as well as a business case to secure financing for the project. It also recommended that the town create a new corporation, the Revelstoke Community Energy Corporation, to manage the system.

The plant was built, piping for the district heat system was installed, and operations began in June 2005.

**LESSONS LEARNED** "You need a council that is committed to the plan and that has the will to complete. It also helps to have one person to steer the whole thing through all its ups and downs," said Geoff Battersby, who was involved in all stages of the project and is now a director of the Revelstoke Community Energy Corp.

"Our partnership with Downie Timber was crucial," he said. "They gave the city the site where the (district energy) plant was built. They agreed to provide the hog fuel (wood residues) free of charge and they signed a 20-year contract to buy energy from us to fuel their kilns."



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### CONTACTS

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**ADDITIONAL RESOURCES** To read the full report or to learn about other GMF-funded initiatives, please visit the GMF website at [www.fcm.ca/gmf](http://www.fcm.ca/gmf) or contact us at 613-907-6208 or at [gmf@fcm.ca](mailto:gmf@fcm.ca).

#### About the Green Municipal Fund

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#### Federation of Canadian Municipalities Green Municipal Fund

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