From propane to biomass

Rural BC community undertakes biomass heating project

By Steve Kozuki, RPF, Executive Director, Forest Enhancement Society

Photography by Gord Chipman, RPF

Ceremony by Esk'etemc Community members for the safe construction of the biomass plant.

The transition from fossil fuels to sustainable sources of energy has been slow, but one small community recently made a big leap toward energy efficiency by installing biomass boilers to provide heat energy for its people: the proud community of Esk'etemc (pronounced ess-ke-tem) people in Alkali Lake, located approximately 50 kilometres south of Williams Lake, B.C.

The Esk'etemc are a forward-thinking community with strong cultural values and connection to the land. The overall project started in 2016 with a feasibility study. Phase 1 of their project to convert from propane to biomass was completed in the summer of 2019 with the completed installation of two boilers which heat eight buildings in the community. The boilers are manufactured in Austria by a company called Froling and distributed and installed by Vancouver-based Evergreen Bioheat.

Phase 2 started in the fall of 2019 and will be completed in the spring of 2020 with the installation of more boilers to heat five additional buildings and the construction of a biomass drying shelter. A drying shelter is needed to keep the moisture content of the fuel below 30 per cent with the ideal moisture content of the material being from 15-30 per cent. Phase 3 will deliver heat to additional institutional buildings as well as several residences in the community. Although the operating costs of heating buildings with biomass is sometimes on par with propane, there is an environmental benefit of utilizing secondary fibre, shifting from propane, a fossil fuel, to biomass utilization, sustainable green energy.

Capital funding for the project was provided largely by the Government of Canada. The federal government provided the majority of the infrastructure funding for the project. The Forest Enhancement Society of BC (FESBC) approved funding for a portion of the biomass that would otherwise be uneconomic to utilize.

The government also created the Low Carbon Economy Leadership Fund to achieve Canada's climate change targets, along with subsequent agreements with the province of B.C. and FESBC, respectively. Under these agreements, forestry is helping to achieve climate change targets in three ways:

1. Planting trees in areas that otherwise would not be reforested and are not under a silviculture obligation, particularly areas of Crown land that have been devastated by insects and disease. These trees will sequester atmospheric carbon dioxide as they grow.
2. Fertilizing trees to make them grow faster and hence sequester carbon faster.
3. Utilizing biomass that otherwise would have been slash burned, to avoid some greenhouse gas emissions and potentially make green energy that displaces energy that might otherwise have been generated from fossil fuels.

The potential displacement of fossil fuel use by using sustainably-sourced biomass from local forests and the avoided greenhouse gas emissions associated with the open burning of logging slash piles aligned with FESBC's purposes. The greenhouse gas emissions profile from open burning contains some very potent greenhouse gases, while controlled combustion at high temperatures is much cleaner.

Consequently, FESBC is providing funding to the Esk'etemc to utilize woody biomass from a wildfire-risk reduction project, rather than open burning the piles of slash. FESBC was already funding the wildfire treatment to protect the community, so it made sense to also partially fund the grinding and hauling of the slash to avoid open burning and instead feed the biomass boiler.

Community members installing the hot water lines.

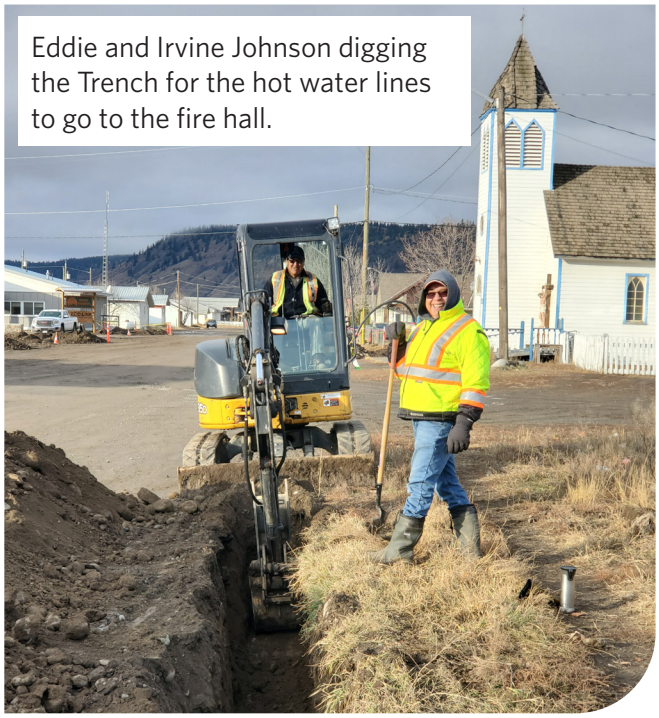
Forestry for the Esk'etemc people

The Esk'etemc own two forestry companies, Ecolink Forest Services and Alkali Resource Management Ltd. (ARM).

Ecolink was established in 1990 as a joint venture business arrangement between the Esk'etemc and Lignum Ltd., and later with Riverside and Tolko Industries Ltd. The company began with a silviculture division, and, in 1994, timber harvesting services were added.

Installation of the Biomass plant.

Pex tubings distributed in ARM shop for infloor heating.



Eddie and Irvine Johnson digging the Trench for the hot water lines to go to the fire hall.

Today, the company continues to seek innovative ways to grow to meet community and customer needs.

The latest example is grinding biomass, not only for their community's biomass boiler, but also grinding significant volumes of forest slash for Pinnacle Renewable Energy and Atlantic Power - 25,000 tonnes per year and 10,000 tonnes per year, respectively. Pinnacle Renewable Energy makes wood pellets, most of which are exported, and Atlantic Power produces electricity, enough to power 20,000 homes. Historically, the companies were able to source their biomass fibre from sawmill residuals. However, as many sawmills in British Columbia have been curtailed or permanently shut down, the secondary fibre consumers have been sourcing an increasing proportion of their biomass from forest slash.

Meanwhile, ARM is an integrated forest management company established in 2001 to manage the forest licenses, woodlot and community forest on behalf of the Esk'etemc. ARM currently manages a 27,000-hectare Community Forest, a 60,000-hectare First Nation woodland tenure, a 400-hectare woodlot, as well as several other forest licences. The mission is to manage Esk'etemc forest resources in a manner that ensures a balance of economic, social, and environmental values that will provide increased benefits for Esk'etemc members, other forest users, and neighbouring communities.

"The Esk'etemc elders have told us that the forests are sick because there are too many trees growing," said Gord Chipman, Alkali Resource Management. "Today's foresters say the issue is resiliency. The biomass project will benefit the lands and the ARM business to expand the utilization of the overstocked forests. This is one more step towards achieving resilient forests for future generations"

Fighting climate change through forestry

Polling consistently shows that climate change is an important issue for people, and this concern is manifested in the climate strikes and protests seen in the news. The good news is there are communities, forest workers, equipment suppliers, pellet plants, co-gen facilities, pulp mills and governments making real and meaningful contributions toward achieving climate change targets while also generating social and economic benefits, including the Esk'etemc.

FESBC Forest Enhancement Society of British Columbia

FESBC was created to help British Columbia fully realize the potential of its publicly owned forests. The goals of the Society are to help reduce wildfire risk, enhance wildlife habitat, improve low-value and damaged forests, and improve the management of greenhouse gases in our forests. With funding from the B.C. government and the government of Canada, B.C.'s forests are being enhanced to create a triple-win for British Columbians, socially, economically, and environmentally. Perhaps the tensions and polarizations around the economy versus the environment debates could be reduced if success stories like that of the Esk'etemc were shared more broadly.

Steve Kozuki, RPF, is the Executive Director of the Forest Enhancement Society of BC. He has worked within the forest industry since 1984. He graduated with a Bachelor of Science in Forestry in 1994 and has held various positions from timber valuation coordinator for Weldwood, general manager of forestry for the Council of Forest Industries to working in BC Timber Sales and timber pricing for the B.C. Public Service. He is passionate about the work FESBC does to advance the environmental and resource stewardship of B.C.'s forests.