

Municipality of the District of Argyle Wood Pellet Initiative

Concept & Proposed Forestry Innovation Transition Trust Application

Bioheat as an Essential Forest Product

In the absence of pulp production, wood heat (bioheat) is the only proven high-efficiency, economic alternative market for low-grade wood fibre, thinnings, and pulpwood. Local bioheat demand supports forest sector financial stability and permits management of timberlands to maximize forest health, productivity, resilience, diversity, and economic value. An example is Austria, which is by far the world's largest producer of high-value mass timber products, such as cross-laminated timber, but is home to only a modest pulp sector. While 30-33% of Austrian wood fibre becomes solid wood products, 60% becomes heat. Austria has approximately the same forested area as Nova Scotia – 4 M ha – but the forest sector generates over 8 times the economic value (GDP contribution). This shows that while bioheat is not the highest value wood product, it can play a central role in an economically successful forest industry by providing an essential market. Bioheat is also a key product within the successful forest sectors in Sweden and Finland, where wood is used to heat numerous cities and towns. In the EU, bioenergy represents 60% of renewable energy, has a 90% renewable heating market share, and is responsible for more greenhouse gas reductions than any other renewable energy resource/technology by far.

The Wood Pellet Boiler Opportunity

The countries with the highest proportion of solid biomass heating, including Sweden, Finland, Denmark, are also the countries with the highest percentage of renewable energy consumption. District energy systems, which consist of underground hot water pipes that connect tens, hundreds, or thousands of buildings to central bioheat or combined heat and power plants, have been essential to achieving high rates of biomass heating. However, district energy systems are generally only viable for concentrated population centres. In rural and low population density areas, wood pellet boilers are the key primary heat appliances for wood fuels. While multiple buildings can be connected to a single boiler, the most common approach is for each building to have its own wood pellet boiler and for pellets to be delivered in bulk by truck. The pellets are blown into a storage space, which is often located in the basement or garage. A typical single-family detached home may require 2-3 bulk pellet deliveries per heating season. The pellet boilers are completely automated, thermostat controlled, and can be controlled with a smartphone. The only building owner requirements are emptying the ash bin once every 3-4 weeks and a 15-minute simple clean twice per year. There are almost 1 million modern wood pellet boilers in operation in the EU at present, with the largest manufacturer, Fröling of Austria, producing over 35,000 units per year.

Municipal Ownership and the Development & Operations Model

Wood pellet boilers have a high capital cost relative to most heating oil and propane furnaces, although a notably lower capital cost than ground-source (geothermal) heat pumps. Wood pellets are typically a much lower cost fuel than heating oil or electricity and all-in heat costs are usually lower than heating oil or heat pumps over 20 years. However, homeowners can have difficulty justifying the upfront capital cost of wood pellet boilers. While some jurisdictions have offered large capital grants to subsidize the cost for wood pellet boiler purchase or have instituted renewable heat incentive policies that reduce payback time, these have not been implemented in Canada to date. TorchLight is proposing an alternative financing, development, and operations model that relies upon federal and provincial Investing in Canada Infrastructure Program funding, matched with private sector investment, to eliminate the upfront capital cost for homeowners. With ICIP funding, a wood pellet boiler initiative would provide income for a municipality, lower heat costs for building owners and businesses, and create a large and valuable market for low-grade wood fibre. A feasibility study must be completed to apply for ICIP funding. The projected wood pellet initiative feasibility study cost is approximately \$150,000.

The Application Approach

TorchLight Bioresources is proposing to complete a full feasibility study for a 200-boiler wood pellet initiative for the Municipality of the District of Argyle. This number boilers, along with bulk pellet storage in Argyle and a bulk delivery truck, is projected to have a capital cost of \$6-8 M. The feasibility study would be led by WestFor, the Crown timberland manager in Argyle, with TorchLight serving as the project manager. Harry Freeman & Son Limited, the largest sawmill in Western Nova Scotia, has investigated pellet production in the past and would be engaged in the study with the goal that pellets would be produced locally in the future (initially, pellets could be delivered from Shaw Resources' Shubenacadie plant). Completion of a feasibility study would not require any cash support by the municipality but would require significant input and support from municipal staff. The cost of staff time could be included in the project budget. TorchLight would prepare draft applications to the Forestry Innovation Transition Trust for submission by WestFor.