

The Story of Wood Residues - from Waste to High Value Energy Products



Liquid fuels from woody biomass fit into a Five-Phase Industry Development Path, from first treating residues from Forestry as “waste”, through to learning about conversion technology options to convert the waste to various forms of energy. We now see wood residue’s potential for generating renewable drop-in fuels that can replace diesel, gasoline and jet fuel:

Phase I - Beehive Burners to Burn Waste

Waste from sawmilling used to be stored, then burned, in large silos called “beehive burners” for the beehive look of their dome-top screens. These beehive burners were built alongside milling operations. Valleys around sawmills used to fill with smoke for days when the beehive burners were burning up the waste. For cleaner air, these burners have since been banned.



Phase II - Searching for Alternative Uses for Waste

Alternative-use markets for sawmill waste wood have helped to divert much of our wood residues to diverse uses - from landscaping, to horse riding arenas, to greenhouse and other agricultural bedding material.

The pellet industry was born out of market searching for alternative uses. Since the OPEC crisis in the 1970’s, Europeans have been looking to wood residues as fuel for heating, and sometimes for conversion to electricity. Several European countries, like Austria, rely almost exclusively on wood waste and pellets to fuel their heating systems for industry, commerce and residential users.

Phase III - Searching for Waste-to-Energy Conversion Technologies for Wood

Increasingly, forestry innovators have been looking to technologies for converting wood waste to energy. As energy prices for fossil fuels have climbed ever higher, and climate change scientists have raised their voices in greater unison, innovators have pushed science to extract solid and liquid fuel energy replacements from wood, which is a renewable resource.



Wood burning for electricity generation has been trialed by BC Hydro through two Bioenergy Calls for Power. Connifex’s new plant construction in Mackenzie represents one of the BC Hydro Bioenergy power projects.

BC Bioenergy Network has not been involved in Power Calls by BHydro. We have been active in identifying conversion technologies for turning wood waste into higher and higher energy value fuels – either in gaseous form, solid form or liquid form.

Nexterra was an early BC Bioenergy Network project partner to pioneer development of synthetic gas from wood waste, for use as a renewable gas to power co-generation of heat and electricity. We also invested in Lignol, which has succeeded in extracting many high-end chemical products from wood.



Phase IV - Torrefaction, the Next Generation Solid Fuel

Torrified wood is basically “roasted” wood, heated to a high enough degree to reduce the wood to its most intense energy content in a solid form. It is also profoundly water repellent, so it is an easy fuel to ship and handle. It has energy and other attribute equivalence to coal, so it can be dropped in to replace coal without capital costs for new equipment. The first commercial-scale plant demonstration in North America is being built in Merritt BC, by DiaCarbon, a BC Bioenergy Network project.

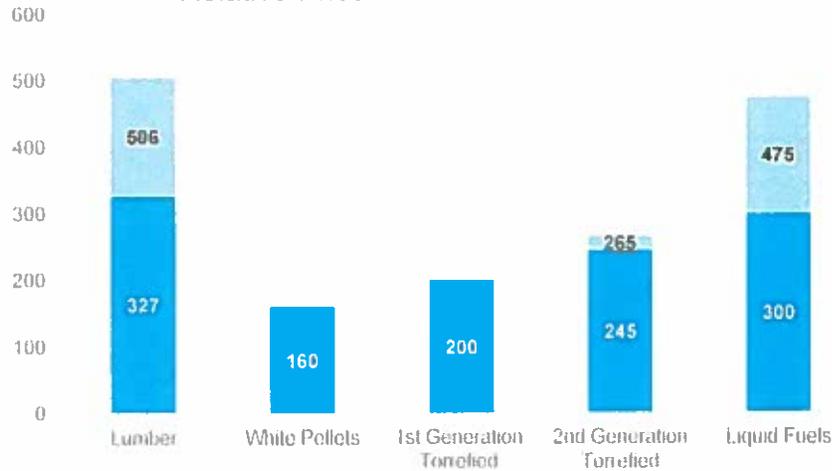
Phase V - Liquid Fuels, the Most Advanced Conversion Technology

There are several developers working on advanced technology to convert forestry residues into drop-in replacements for diesel, gasoline, and jet fuel. Washington State University is currently assessing a fully integrated production system for jet fuel derived from Washington and Oregon forestry operations. BC Bioenergy Network has been following Dr Sam Weaver’s Proton Power technology for a number of years and is pleased to work with this group to help accelerate deployment of this technology throughout BC. Significant new jobs can be generated from this advancement.



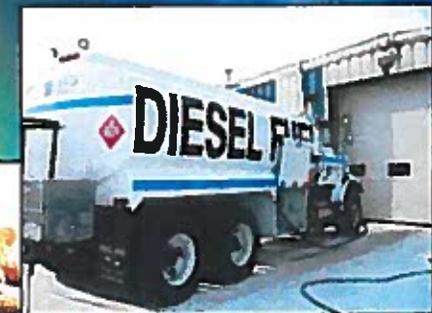
New Technologies will allow us to extract more value from unutilized forest resources

The Economics of New Technologies
Relative Price / Contribution Index Per Tonne



Catalyst for Sustainable Growth

Next Generation Bioenergy
2015 to 2020



BC Bioenergy Network's Success Story

BCBN has supported 22 major capital projects in BC since 2008 – each one demonstrating a new technology to make organic waste-to-energy conversion more technically possible, more economically viable, and more environmentally positive. We have proven that there are economically viable conversion technologies to produce electricity, biogas, and solid fuels from new sources, and to reduce GHG emissions in all 3 sectors - Forestry, Municipal, and Agriculture.

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