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PAPERWEEK PREVIEW

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INTERVIEW: FORTRESS CEO

FIBRE as FUEL

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Tom Browne, FPInnovations

MISSION STATEMENT: To promote the pulp and paper industry in Canada by publishing news of its people and their innovations in research, technology, management and financing, as well as forecasts of future trends. Serving the industry since 1903.



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Cover image: Unloading biomass at UBC. Photo by Don Erhardt

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Take full advantage of our natural resource

I love seeing exposed wood in industrial buildings. It is so wonderfully surprising to see such natural beauty in the midst of all the sharp angles and shiny surfaces of machinery and equipment.

Cascades' plant in Lachute, featured in Dec. 2009 issue, showcases the glory of wood. Inside, the building is visually stunning. So is the new building that houses the University of British Columbia's CHP bioenergy system. The gasification system is profiled on page 30, but there was no room in that story to give credit to the structure that surrounds the groundbreaking biomass-to-electricity system.



Cindy Macdonald
Editor

Designed by McFarland Marceau Architects, the building was constructed using cross-laminate timber (CLT), a solid wood building material that can be used as a low carbon, renewable alternative to steel frame construction. This is one of the first CLT buildings in North America and will demonstrate the product's market potential.

Moving from solid wood products to waste wood products, I've chosen this month to address the question of fibre availability in the face of growing use of pellets and other forms of biomass to generate heat and power. The UBC CHP system is one recent example. Coming on-stream in the next two years, there will also be the conversion of Ontario Hydro's Atikokan generating station to biomass, and Nova Scotia Power's new biomass boiler being built at the site of what is now Port Hawkesbury Paper. Not to mention the 1.3 million tonnes/year of pellets we're exporting overseas.



Photo: Don Erhardt

UBC's Bioenergy Research and Demonstration Facility also demonstrates the benefits of building with wood.

Various experts in the bioenergy sector agree that competition for fibre will not be widespread, and is not imminent.

That's good news, because it suggests that the forest products, pulp and paper, and bioenergy sectors can continue to grow in concert, feeding each other rather than cannibalizing the supply chain.

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UBC biomass CHP system provides renewable heat and electricity for campus

Nexterra Systems Corp., the University of British Columbia and GE celebrated in September the successful completion of the energy-from-renewable-waste combined heat and power (CHP) system located at UBC's Vancouver campus.

GE's Jenbacher gas engine will produce 2 MW of clean, renewable electricity that will offset UBC's existing power consumption, enough to power approximately 1,500 homes. The Nexterra system will also generate 3 MW of thermal energy, which is enough steam to displace up to 12% of UBC's natural gas consumption. This will reduce UBC's greenhouse gas emissions by up to 5,000 tonnes per year.

Officially named the "Bioenergy Research and Demonstration Facility (BRDF), the system has completed a comprehensive testing program for reliability, capacity and emissions, and has successfully connected to the grid. "This exciting facility targets a major challenge facing society – the need for new, clean energy solutions that work at a community scale," says UBC President Stephen Toope.

Using Nexterra's proven gasification technology platform and innovative gas clean-up and thermal cracking solution, the system converts locally-sourced waste wood into a clean, reliable gas that is suitable for use in a high-efficiency, industrial-scale gas engine to produce heat and power. According to Nexterra, the system will deliver electrical efficiencies that are 25% higher than traditional methods for producing biomass-based electricity at this scale.



Photo: Nexterra

A local fuel supplier delivers urban wood waste to the BRDF two or three times a day.

"For innovative technologies to have a real impact, they need to be commercialized and used in the market," said Dr. Vicky Sharpe, president and CEO of Sustainable Development Technology Canada (SDTC). "Nexterra's CHP system is taking a big step in that direction today." The BRDF requires about 12,500 bone-dry metric tonnes of locally-sourced urban wood waste per year – or approximately 50 tonnes per day. The feedstock for the UBC project is a variety of wood waste including tree trimmings from the City of Vancouver, wood trimmings from furniture and other wood manufacturers, and clean construction and demolition debris.

The fuel is sourced from a local aggregator, and delivered to the site by truck, averaging 2-3 trucks per day. Once emptied into the fuel handing area, the biomass is screened for oversized and non-woody material, dried if required, and then gasified

to produce a synthesis gas called syngas. This syngas is then burned in an oxidizer to produce steam/hot water to heat the UBC campus and/or the syngas is cleaned and conditioned to an engine grade fuel that is fired directly into a GE Jenbacher engine to produce electricity.

The start-up of the system represents the culmination of more than four years of product development work and collaboration with GE's Gas Engines business.

The total combined cost of the UBC BRDF is about \$26 million. Funding support this project was provided by: Natural Resources Canada and Western Economic Diversification Canada; BC Innovative Clean Energy Fund and the B.C. Ministry of Forests, Mines and Lands; Sustainable Development Technologies Canada (SDTC); the BC Bioenergy Network; and FPIInnovations. "With this project, Nexterra, UBC and GE have advanced the industry's clean energy efforts significantly, thereby solidifying the Canadian expertise in green energy," said Jean Hamel, pulp, paper and bioproducts vice-president, FPIInnovations.

