



“CN can move a ton of freight about 470 miles on just one gallon of fuel.”

CN uniquely positioned to serve wood pellet producers and distributors

Wood pellets among the cleanest-burning and most renewable sources of energy available

Essentially made from forest product ‘leftovers’, such as wood shavings and sawdust, wood pellets offer a renewable energy source for power generation and residential heating. The U.S. Environmental Protection Agency (EPA) has endorsed wood pellet heat as one of the cleanest-burning and most renewable energy sources available. And, according to the Biomass Energy Resource Center, one ton of pellets can provide the same heat as 120 gallons of heating oil or 170 gallons of propane. Canada is the world’s second largest producer of wood pellets (after Sweden). Canadian production is largely based in British Columbia, with Quebec, Alberta and Ontario on the rise. Given that the total worldwide demand for wood pellets is expected to double in the next five years, pellet production and distribution represent compelling renewable energy business opportunities.

Jerome Lavoie is CN’s market manager, forest products. “The wood pellet industry is growing at an explosive rate, particularly in the US where several new production facilities are

currently under construction. Rail is the most efficient way to transport wood pellets for two reasons: First, pellets are heavy and voluminous, so long distance trucking is generally not cost-effective. Second, pellet production usually occurs in close proximity to lumber mills, which are usually rail-served and thus minimizes additional investment in laying down new track,” explains Jerome.

“We are in the infancy of the wood pellet market,” says **Andrew Fuller**, director of marketing, forest products, CN. “By contrast, most forest product markets are very mature. If North America follows the same renewable energy mandates as Europe, this could represent a huge opportunity for CN. Rail is definitely the best way to transport wood pellets because of the massive tonnage involved. It would take 200 to 300 trucks to move the same volume of wood pellets we can transport with one intermodal train. And of course, wood pellets are a renewable energy source located right in our backyard.”

Currently, about 65% of the total demand for wood pellets comes from Europe. Here is a typical example of how wood pellets get to market: Pellets are manufactured in the Prince George, British Columbia region and transported by rail to the port of Vancouver. From there, the pellets are loaded onto a ship headed for Europe, via the Panama Canal.

“CN is uniquely positioned to provide rail transportation to pellet producers in Western Canada,” continues Jerome. “We expect to transport more than 800,000 tons of wood pellets this year. We have the infrastructure: CN is the only railroad with direct access to export terminals on the Pacific, Atlantic and Gulf coasts. And, we’re already North America’s number one mover of forest products, so we also have the expertise.”

“At present, European demand is mostly for power generation, whereas the US market is largely focused on residential heating,” adds Andrew. “Due to the ecological benefits, we expect to see a lot more Americans

by Mark Lowe

using wood pellets to heat their homes. In terms of serving North American power generators, the principal challenge comes from coal. It's not as good environmentally, but coal remains comparatively inexpensive."

CN's partnership with wood pellet producers and distributors makes financial sense, but also represents the union of two ecological leaders in their respective sectors: transportation and energy. "This is where CN's green advantage really comes into play. CN can move a ton of freight about 470 miles on just one gallon of fuel. And, in general, rail has been shown to emit one-sixth the greenhouse gases created by trucking," concludes Jerome.



Jérôme Lavoie, market manager, forest products (left) and Andrew Fuller, director of marketing, forest products

"We expect to transport more than 800,000 tons of wood pellets this year."

Quick facts

Wood pellet specs and energy value

- Produced of waste wood like wood shavings and sawdust
- High-temperature used to form the waste materials into the pellet
- It's a renewable resource, right in our own backyard.
- Refined biomass which transports around the globe
- Carbon neutral
- Low ash: less than 1%
- The U.S. Environmental Protection Agency (EPA) has endorsed wood pellet heat as one of the cleanest-burning, most renewable energy sources on Earth.
- Energy value of 20.4 GJ/ton or 5.6 Mwh/ton
- Average home consumes 50M BTUs per heating season or 3 tons of pellets
- According to a report from the Biomass Energy Resource Center in Montpelier, Vt., one ton of pellets can provide the same heat as 120 gallons of heating oil or 170 gallons of propane. Conversely, paying \$200 per ton for

pellets – an average rate around the country – is akin to paying \$1.67 per gallon for heating oil.

Current pellet end users

- Industrial
 - Power Generation
 - District heating
 - Greenhouse growers
 - Cement plants
 - Aluminum plants
- Residential
 - Home heating
 - Stoves, inserts and furnaces
 - Barbecue stoves
 - Animal Bedding

Production

- Global production reached close to 10M tonnes in 2008
- Worldwide production to double by 2014 and some industry experts forecast an annual growth of 25-30% globally over the next ten years, (*Wood Resources Quarterly*)
- Canada's 29 wood pellet plants currently have a combined capacity to produce 2M tonnes.
- 2008 Canadian shipments
 - Europe 800K MT or 65%

- US 250K MT or 20%
- Asia 62K MT or 5%
- Canada 125K tonnes or 10%
- TOTAL 1.25M tonnes

Consumption

- NA consumption on track to exceed 3M tonnes in 2010
- Ontario Power Generation to convert to wood pellet by 2012 at its Atikokan plant to replace the use of coal
- CN shipped 445K tons in 2005 and is on track to exceed 800K tons in 2009 for a 16% compounded annual growth.
- Growing the domestic North American market
 - CN shipped 27K tons of pellets to the US in 2005 and 2009 forecast is more than 80K tons
 - CN shipped 283 tons to Quebec in 2005 and tracking to reach 24K tons this year
 - Only 1800 tons to Ontario in 2006 and we are expecting more than 13K tons in 2009
- Main producers are in BC, some in AB, a few in QC. First major Ontario producers expected to start production in 2010



Michael Scanlon, purchasing manager, PelletSales.com

Customer Case Study
American Biomass/PelletSales.com

Headquartered in Goffstown, New Hampshire, American Biomass' mission is to facilitate the distribution and sales of wood pellets. This objective is accomplished thanks to a nation-wide network of manufacturers, a team dedicated to managing distribution and transportation, and the simplicity of Internet shopping. Selling wood pellets online and providing direct transportation to the consumer has proven to be a successful strategy. Today, American Biomass, and its retail arm PelletSales.com, is the nation's leading independent distributor of wood pellets. CN expects to ship more than 25,000 tons of wood pellets to American Biomass/PelletSales.com's network of distributors this year.

"We are in a very competitive market, so containing our transportation costs is critically important," says Michael Scanlon, purchasing manager, PelletSales.com. "About 80% of our sales are in the northeastern US and typically we ship to regional distribution centers that are served by rail. We decided to work with CN for several reasons: First, CN has tracks where we have manufacturers, mostly in British Columbia and Quebec. Second, CN makes it cost-effective to transport pellets from western Canada to the northeastern US. Overall, CN has been a great partner for us because it has recognized the potential of our industry and by positioning itself as the industry transporter of choice, CN's role is very likely to expand as our industry continues to grow," concludes Michael.

Customer testimonials

Granules LG is a Quebec company located in Saint-Felicien QC and was established in 1995. The pellet producer is currently planning to have rail built in at its facility in St Felicien, which will allow them to load directly at the mill instead of trucking to a reload nearby. Granules will be able to load pellets in both bags and in bulk from their production plant. Having rail access will lower the delivered cost to reach their customers and make the company even more competitive in the market. Granules LG is also currently investing in new equipment to increase production capacity from 90K tonnes to 120K tonnes per year and expects to reach 200K tonnes in 2010. Granules LG started to ship with CN in late 2008. The Quebec producer shipped just over 1500 tons last year and is now on track to reach more than 20K tons in 2009.

Pinnacle Pellet Inc. is a growing, conscientious, proud and successful company. The company is dedicated to maintaining and protecting our environment while making full use of their resources. Their goal is to produce the best quality wood pellets while providing the finest quality customer service. In order to ensure future growth and profitability for all, they aim to be at the "pinnacle" of the market in the wood pellet industry. The pellet producer operates 5 plants in British Columbia and are all located on CN railway lines, connecting to the Ports of Prince Rupert and Vancouver, where they load onto ships destined for overseas markets. They also connect via rail to the major arterial east-west line that runs across Canada, for access to markets in the

US mid-west and northeast as well as central Canada, and the north-south line that connects to western North America. The five BC plants are located in Quesnel, Houston, Williams Lake, Armstrong and Colebank and have a combined production capacity of 600K metric tonnes per year. Pinnacle shipped 70K tons in 2005 and has grown its shipments to over 470K tons with CN in 2008.

American Biomass recognized that there was a need in the industry for retailers to be able to go to a source they could count on for reliable supply, for independent quality assessments – and for service. The business began operations in the Northeastern United States, and then grew rapidly to support mounting demand in the MidAtlantic,



Customer Case Study **Energex Pellet Fuel**

Founded in 1982 and headquartered in Lac-Mégantic, Quebec, Energex provides the northeast with the highest quality wood pellets. Energex's operations include manufacturing wood pellets from the sawdust and shavings of regional forest product facilities, and packaging wood pellets from other sources. CN expects to ship more than 3,300 tons of wood pellets for Energex this year.

"95% of our wood pellets are sold in New England," says John Arsenault, vice president, Quebec operations, Energex. "Because the demand for wood pellets comes mostly from the northeastern US and production is primarily based in western Canada, it makes financial and logistical sense for us to ship large quantities of wood pellets from BC to Quebec, particularly when there is a shortage of raw materials locally. And, this is where we rely on CN. We are very pleased with the role CN plays in our business and have been impressed with recent technological innovations including Web-based tracking and electronic billing, which have helped us further streamline our operations," concludes John.



**John Arsenault, vice president,
Quebec operations, Energex**

West and MidWest, and now operates nationwide. PelletSales.com, American Biomass' retail arm, was founded by Jon Strimling to make finding and purchasing wood pellets easy. Strimling realized that many consumers were not being effectively served by existing distribution channels. His concept – making pellets available on-line and delivering directly to consumers – has now caught on. After a small start with shipment from one facility in Massachusetts, the company has rapidly grown into the nation's leading independent distributor of pellet fuels. Their goal is to streamline both the flow of materials and the flow of information in the industry. Transportation can be up to 50 percent of the cost of pellets, so they focus on always finding the shortest possible path between a

manufacturer and consumer, saving end users money. Right now, in most markets, this means providing bagged pellet fuels, but they soon expect to be able to offer bulk delivery of pellet fuels more broadly.

- Their network help them make pellet fuel easy:
 - Dozens of wood pellet manufacturers are standing by to help us meet demand.
 - Their affiliations with more than 100 stove manufacturers and their affiliated stove shops help them keep in touch with product requirements and industry trends.
 - Their carrier and distribution center network is unrivaled in the industry, providing us nationwide coverage.

- CN shipments to various distribution centres for American Bioamass started 2008 with 5700 tons and they are now on track to exceed 25K tons for 2009.

Future Opportunities

Torrefied (above 250 degree Celsius) and pelletized (TOP) pellets is the future generation of wood pellets. This pellet will have a higher calorific value; will have higher bulk density, and will be hydrophobic making it easier to transport and store and more competitive versus other energy sources. The TOP pellet is expected to open up new global markets for biomass producers