

# Make it Electric



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## Buzzing with efficiency

### Bemidji lumber mill achieves energy, operational gains

Two shifts a day, four days a week, the Potlatch Corporation lumber mill just east of Bemidji, Minnesota, makes the cut.

Logs from pine, spruce, and fir trees thump, roll, shake, slide, and spin along the production line at the company's Bemidji plant. The logs emerge from the other end transformed into top-grade studs used primarily in residential construction.

Minnesota trees have been harvested and processed into lumber for more than a century, and Potlatch has been in the business in Minnesota since the 1960s. The company has been an innovator in forestry and forest products, and its Bemidji plant stays in the lead with the newest technologies and the most efficient systems available.

#### Bringing it home

Pick up a stud in a local home-improvement center, and chances are you're buying Potlatch-processed lumber.

The Bemidji mill produces about 110 million board feet of lumber every year, or enough to build 40 homes every day. The lumber comes out in 2'x3', 2'x4', and 2'x6' studs in solid and finger-jointed lengths of 6 to 10 feet. Potlatch sells the lumber to home centers, stocking distributors, and lumber brokers primarily in the lake states (Minnesota, Michigan, and Wisconsin) and the Midwest.

Pete Aube, Lake States Resource and Mill Manager for Potlatch, oversees the lumber and forestry operations. "Bemidji is rich in work ethic, talent, and good people so it's a tremendous place to do business," said Aube. "Our top strategy is to build a high-performance team, and that has been easy to achieve with the workforce here." The strategy has paid off; the Bemidji plant's skilled and dedicated crew has made the plant a top performer in the industry nationwide.

#### Sustainable forestry, sustainable business

Potlatch is a real estate investment trust that owns and operates nearly 1.7 million acres of forest land in Arkansas, Idaho, Minnesota, and Wisconsin. Its primary business is growing and harvesting timber. Through its wholly owned subsidiary, Potlatch Forest Products, Corp., the company operates solid wood (lumber and plywood), consumer tissue, and real estate businesses.

Sustainable forestry is just as important to the corporation as quality and profitability. All of Potlatch's forest lands and most of its 12 mills are certified by the Forest Stewardship Council. The Council is a nonprofit organization supported

#### A look inside:

- Investigating potential for additional energy from corn

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*Pete Aube, Lake States Resource and Mill Manager, Potlatch*

by groups such as the Rainforest Alliance and World Wildlife Fund. The Council sets international standards for sustainable and socially beneficial forestry.

Potlatch came to Minnesota in the 1960s and at one time had six facilities in the state. It's still the state's largest landowner with about 320,000 acres, but the Bemidji plant is its only remaining Minnesota facility. While the Bemidji mill is the largest in Minnesota, it's small compared with Potlatch's other plants.

That's neither here nor there, says Aube. "It's not about how much product you make but how much value you create for shareholders."

### **In pursuit of the perfect cut**

Logs processed per day, week, or month; total annual board feet of lumber; number of finished boards—that's not what matters most, says Aube. Instead, because logs make up 70 percent of a lumber mill's costs, it comes down to making the most of every sliver of wood.

That requires skilled people and technologically advanced equipment pushing the limits to maximize value per log. And that means making the best cuts into the best sizes, considering in the process optimal cutting orientation based on natural flaws in the wood. To achieve that kind of precision, Potlatch has invested thousands of dollars to upgrade equipment and computer systems.

Its state-of-the-art 3-D scanning system, which takes 600 measurements per inch of log, considers hundreds of product options and determines the best cutting orientation for maximum value. With that information, a machine repositions a log on the conveyor, then the log is cut and moved on down the line. All of that happens in just three-tenths of a second.

The entire mill is optimized in similar ways. What's more is that it uses or sells every speck of sawdust. "There's no waste," says Aube. "We have to maximize log value, so everything here is a product."

In addition to railcar loads and truckloads of lumber, the mill sells loads of wood chips, shavings, and sawdust to pulp and paper makers and companies that make animal bedding. The plant also uses waste to fuel its drying kilns, and the ash winds up fertilizing Minnesota farmers' fields.

Lumber carries the highest value, but only about 45 percent of what enters the plant in logs exits as studs. That's why every cut is important, and every fraction of an inch impacts profitability. According to Aube, for every 30/1,000 of an inch of wood that doesn't wind up in lumber, the mill loses 2 percent in efficiency.

"This is a game of thousandths of an inch so we spend a lot of energy chasing precision and efficiency," said Aube. And that's where electrical efficiency comes in.

### **Efficiencies, expected and unexpected**

Over the years, Potlatch has taken full advantage of Otter Tail Power Company's Conservation Improvement Program, which offers grants to qualifying companies for implementing energy-saving measures.

Most recently the utility encouraged Potlatch to audit its compressed-air systems. Industrial facilities use a tremendous amount of power to generate air pressure, and inefficient compressor systems can cost a company thousands of dollars a year. Otter Tail Power Company helped pay for the audit, and the results were more than either Potlatch or the utility expected.

The independent auditors recommended that, instead of running two 150-horsepower compressors, Potlatch maximize efficiency with one 200-horsepower unit. The result is a system that conserves energy and provides greater reliability. That was expected, but heightened control and quality were pleasant surprises. Aube says the improvements in equipment responsiveness and consistency, as well as cut precision, have been dramatic.

“This company regularly invests huge dollars to increase productivity by 1 percent,” said Aube. “In this case, we got double that for next to nothing.”

The audit was only the most recent collaboration. With Otter Tail Power Company’s help and guidance, Potlatch has improved operations and profitability by installing variable-speed drives and high-efficiency motors, enhancing electrical systems, and improving processes.

“Otter Tail Power Company always has been there for us, bringing opportunities to our attention and helping to make them reality,” Aube said. “We didn’t select Otter Tail Power Company as a business partner, but if we were to select one, I can’t think of anyone better.”



*Potlatch’s skilled people and technologically advanced equipment push the limits to maximize value.*



*The company provides lumber to home centers, stocking distributors, and lumber brokers primarily in the lake states (Minnesota, Michigan, and Wisconsin) and the Midwest.*

## Otter Tail Power Company helping to investigate potential for extracting additional energy from corn



The Agricultural Utilization and Research Institute (AURI), the Minnesota Corn Growers Association, Rein & Associates, Otter Tail Power Company, and the City of Fergus Falls, Minnesota, together are studying the potential for extracting additional energy from corn used to produce ethanol.

This work involves three phases, all conducted at the Fergus Falls Wastewater Treatment Plant. Initially Rein & Associates demonstrated that a byproduct from the ethanol process, called stillage, could be used to produce biogas, a mixture of methane and carbon dioxide. Phase I of the study took place from January 2007 through March 2007 and used thick stillage as a biofeed stock for the anaerobic digesters. This phase demonstrated that thick stillage could produce sufficient additional biogas to satisfy the treatment plant’s natural gas requirement.

Phase II began in June 2007 using thin stillage as the biofeed stock for a 250-gallon-a-day specially constructed digester pilot plant. This phase demonstrated that thin stillage could be used at an ethanol plant to produce energy to fuel the ethanol production process.

Phase III began in September 2007 and is a demonstration of the feasibility of producing an organic granular fertilizer called struvite from thin stillage in a skid-mounted pilot plant. Struvite, which normally is a problem for facilities that treat wastewater, is a slow-release fertilizer that can be marketed profitably to the turf industry (golf courses, sod producers, etc.).

“**These results are preliminary,**” emphasizes Brian Draxten, Otter Tail Power Company representative on this project, “but they appear to offer good possibilities.” Two additional steps are necessary for this concept to go commercial. The first would be to demonstrate that recyclable water could be produced, and the second would be to construct and operate a full-scale demonstration at an ethanol production facility.

Otter Tail Ag Enterprises, the ethanol plant under construction near Fergus Falls, has been a strong supporter of this work to extract more value from corn. Otter Tail Power Company’s interest in the project is the possibility of producing methane gas from a methane digester. This gas could be used to power an electric generator, explained Draxten or, if the gas were burned at the ethanol plant, to provide carbon offsets for methane destruction.

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