

# wood bioenergy

Bio-Energy, Fuels & Products  
Symposia & Expo [www.pelice-expo.com](http://www.pelice-expo.com)

1ST QUARTER 2010

A Hatton-Brown Publication



Mitchell Logging Diversifies

## Pellets On Tap

### Indeck Ladysmith, LLC

**INDECK ENERGY**

[www.indeckpellets.com](http://www.indeckpellets.com)



Pellet Producer  
Bear Mountain  
Has Time On Its Side

By Jennifer McCary

LADYSMITH, Wis.

**I**ndeck Energy Services Inc., a privately held energy company with more than 20 years of experience in renewable and conventional power plants, and partner Midwest Forest Products Co. (MFP), a timber management and logging firm with more than 30 years of experience, started up their first joint venture in the renewable biomass pellet business on July 15 last year. In just over a month, Indeck Ladysmith Biofuel Center had ramped up to 75% of the plant's projected annual capacity. Now at full capacity the facility is primarily focused on domestic markets, supplying residential heating and industrial power generation needs.

Originally the 34 acre site in Ladysmith's Industrial Forest Products Park was slated to become Indeck Energy's second wood power plant. That project was tabled, but it brought management from Indeck and MFP together, leading to formation of the Ladysmith partnership. Both companies had also been eyeing the growing pellet fuel business and saw it as a potential opportunity to develop.

Site attributes were equally applicable to making pellets as they were for generating power. Plentiful wood basket; highly skilled workforce in the forest industry; access to cost effective rail transportation; and a receptive local community were considered key assets of the location. The City of Ladysmith provided assistance with obtaining a grant to construct a rail spur, tax incentives and TIF (tax induced financing) funding for infrastructure development.

A pellet mill utilizing the wood resource was a natural extension of the energy company's focus on renewable energy production. Indeck already had renewable power plants operating in New England. To spearhead the pellet project Indeck Energy hired experienced veterans of the OSB (oriented strandboard) industry. Plant manager Jeff Schultz and safety, quality control, logistics manager Darren Winchester together have nearly 50 years of experience in the OSB and engineered wood products industry. That training is reflected in their approach to product formulation, quality control and safety training.

Pooling Indeck's technical expertise and the forest procurement expertise of MFP has proven to be a winning combination for the new plant. The mill runs a 24/7 operation with two 12-hour shifts, four crews and 27 employees.

## Development

In designing the facility, managers wanted to avoid some of the unanticipated hurdles that have plagued others entering the pellet biofuel industry. "This mill was designed with an incredible amount of flexibility, not just in the intake of raw materials but the shipping of finished products as well," states plant manager Schultz. The mill accepts raw material in three forms—roundwood, green chips and green sawdust. It sorts and blends various fiber classes to maintain control of recipe development. And it ships finished product four ways—bulk rail, bulk truck,



Midwest Forest Products procures raw materials.



QC Manager Darren Winchester, left, and Plant Manager Jeff Schultz have OSB backgrounds.



Roundwood is purchased in 8 ft. bolts.

palletized rail and palletized truck.

Indeck Energy served as general contractor on the \$20 million project. Energy Unlimited, Inc., Dodgeville, Wis., was primary subcontractor providing project design and installation. Energy Unlimited has an extensive history in dehydration systems in several industries including wood pellets and has built several turnkey pellet projects since 1989.

Primary processing equipment is supplied by Andritz Sprout, an Austrian company with manufacturing facilities in Muncy, Pa; Bliss Industries, Ponca City, Okla.; Baker Rullman Manufacturing, Watertown, Wis.; and Magnuson Corp., Hayward, Wis.

“We wanted to go with as much American equipment as we could because we think that is an important thing to do,” states Schultz.

Significant attention was also given during the design phase to controlling the quality of finished pellets. “One of our philosophies when we started here was that we wanted to know in real time the quality of what we were producing,” he emphasizes. Management carefully monitors four critical quality components: moisture content, ash content, product consistency and durability. Two samples are pulled for every 1,000 tons of production. One is sent to Twin Ports Laboratories in Superior, Wis. The second sample is used in-house for verification tests.

To achieve this level of quality control, a substantial investment was made in extra lab equipment capable of duplicating nearly all physical property tests performed by Pellet Fuels Institute (PFI) approved test laboratories. The company even has the latest testing technology available in the Arizona Instruments Max 5000 moisture and ash testing instrument introduced last spring. It cuts test times from six hours to roughly 30 minutes QC manager Winchester reports their pellet ash content averages .6%, well above the requirements for premium grade pellets and very close to super premium grade criteria. The A&D moisture balance machine is used to measure moisture content in the finished product.

PFI recently adopted a quality assurance program that gives pellet consumers a quality comparison tool. Indeck Ladysmith is among the early registrants of that program.

## Wood Yard

Wood procurement is something the parent company had little experience in so it partnered with Midwest Forest Prod-



Andritz Sprout pellet mills

ucts, which is in effect the mill’s wood broker. MFP is responsible for procuring the plant’s green feedstock and ensuring that the wood yard has the species mixture necessary as the operation tweaks the fiber recipe needed for optimum pellet properties.

Green chips and mill residues arrive by truck. Those with walking floor vans offload onto a concrete pad. All others are dumped at a Phelps truck dumper.

Roundwood is purchased in 8 ft. bolts and sorted by species in the log yard. A Caterpillar 325DL self-propelled loader equipped with a Great Lakes trailer transfers high volumes of wood to the infeed deck of a Carmanah Fuji King debarker, which is similar to a drum debarker except the drum doesn’t turn. Instead, a live bottom with rotating shafts keeps the wood rubbing against itself. Additional rotating shafts with teeth help to remove the loosened bark. Bark byproducts are sold to landscaping and power generation markets.

Debarked logs advance to a 600 HP Carthage 12-knife chipper. Chipped material flows on a Magnuson conveyor with a radial stacker that swings in an arc to deposit chips on the appropriate chip pile, sorted according to fiber density.

Wood species is primarily northern hardwoods and aspen with a small percentage of pine and other softwoods. These are sorted into four classifications, then batch fed through the chipper so that they can be proportionately blended to achieve the desired properties in the finished product.

“These things are also adjustable by changing the pellet mill set up and die thickness,” states Schultz. “But machine changes are expensive so we control the input to give us the desired output.”

## Processing

A Caterpillar 950H front-end loader transfers chips to one of four West Salem Machinery hoppers equipped with metering belts to maintain control of the fiber blend. Blended fiber flows into a Precision shaker screen to remove oversized material prior to entering a Bliss Industries wet hammermill.

The blended and hammermilled fiber then flows into a 60 ft. Baker Rullman triple pass drum dryer. An Energy Unlimited biomass burner provides the dryer’s process heat.

“The triple pass design allows us to operate at lower temperatures and have greater retention time in the drum,” notes Schultz. A Doscher moisture meter positioned at dryer out-

# Profiles

- Illinois based parent company Indeck Energy Services is a privately owned company dedicated to finding energy solutions using local resources and producing environmentally responsible energy for future generations. Indeck develops, owns and operates power generating plants using conventional and alternative fuels.

Projects have utilized renewable feedstocks like ag waste, woody biomass, municipal waste and conventional feedstocks such as coal, natural gas, oil and hydropower, depending on the market and geographic region resources.

Indeck currently owns three biomass energy plants—two in Maine and one in New Hampshire. The company has ownership interest in more than a dozen ethanol plants and one biodiesel plant with production capacity over 1 billion gallons of biofuel.

Indeck Ladysmith is the company's first solid biofuel plant and a second facility of equal size is planned for Magnolia, Miss.

- Midwest Forest Products, based in Hayward, Wis., is a leading supplier of wood fiber for the paper industry in the Lake States, Canada and New England.

Founded in 1977, the company pioneered the use of portable ring debarking and chipping services. Founding partner, now sole owner, Ken Maki developed the portable debarker concept which was incorporated into the Manitowoc portable ring debarker. Through the years, the company has operated four chip mills, four portable debarkers, one portable chip mill and a softwood sawmill.

With more than 30 years experience meeting the strict quality standards of the Lake States sulfite pulping industry, the company has earned a reputation for consistently supplying products with less than 0.5% bark content.

Today, the dealer operates extensive procurement network and trucking operations, delivering products throughout the Lake States. Pulpwood is purchased at 32 remote accumulation yards in Wisconsin and Michigan, which are serviced by four portable debarkers. The company also operates chip mills in Mercer and Iron Mountain, Wis. 🍃



Robotic stacking line

feed measures the moisture content. A Grecon spark detector is also located at the outfeed.

Fiber goes immediately into a second Bliss hammermill for final sizing and the meal is stored in an Energy Unlimited storage bin. Augers feed the wood meal onto the infeed auger supplying three Andritz Sprout 26 in. pellet mills. Each machine is producing about four and a half tons of dry pellets per hour.

Doscher Moisture Scan XT meters read moisture content as fiber enters the pellet mill line and again prior to entering the cooling tower.

Pellets exit out the bottom of each pellet mill onto the main conveyor, which is an enclosed v-groove conveyor, feeding a Creamer bucket elevator. The elevator climbs to the top and dumps the hot pellets into a Law-Merot-Milpro cooling tower that uses fan drawn ambient air to cool the pellets. The elevator is also equipped with a Grecon spark detector. Cooled pellets cross over an Andritz two-layer shaker screen to remove fines before being blown into one of two storage bins.

A GSI storage bin routes pellets back into the plant, across shaker screens to sift out any remaining fines before it enters the hopper feed of a Hamer automated bagging system. Baker Rullman scales measure bag weights as they are filled. Bags are sealed and sent to a rollcase conveyor where a Pasco robotic arm stacks bags onto pallets. Pallets are wrapped at an automated Wulftech shrink wrap system. A Baker Rullman bin is used for bulk loading railcars and trucks.

Three Imperial baghouses collect dust throughout the plant. Energy Unlimited supplied a high efficiency cyclone to collect particulate off the dryer exhaust.

## Marketing

In the past, the parent energy company's marketing program was much simpler and primarily consisted of putting electricity on a transmission line. Indeck Ladysmith is their first experience with producing a product that has to be marketed and sold in the "public square" so to speak. "Our challenge is to distinguish our product from the next bag of

pellets on the shelf," Schultz observes. "We think we are making the best pellet out there, so the challenge for us is to get that message out."

The company's primary market has been domestic heating in residential and commercial heating systems. Pellet fuel is a more cost effective source of heat, typically displacing propane and #2 heating oil respectively in the Midwest and Northeast. Converting to a home pellet heating system is an easy renewable energy conversion that is not dependent upon government subsidies or additional regulations to achieve. 🍃