Land of the Rising Mill

The East Malaysian state of Sarawak is home to the region’s newest, and quite possibly the largest, pellet mill—the first of many to follow.
By Ron Kotrba

Borneo, the third-largest island in the world, is shared by three sovereign nations: Indonesia, Malaysia and Brunei. Two Malay states occupy northern Borneo and, together with the Federal Territory of Labuan on an island off the coast of Borneo, make up East Malaysia, or Malaysia Timur, of which Peninsular Malaysia lies just west. The largest Malay state on Borneo, Sarawak, is home to one of the newest and largest pellet mills in Southeast Asia—if not the largest.

Built by Spanish engineering company Prodesa, the 120,000-ton mill, called Green Pellet (Sarawak) Sdn. Bhd. (GPS), is a joint venture between international trading group CellMark, the public institution known as Sarawak Timber Industries Corp., and a private, local investor and wood plant owner named Derasas Jaya SBD. “They conform to a group that can work very well because all of them add value to the joint venture, covering the weakness of the others,” says Victor Monge, Prodesa sales engineer for the Asian region.

Monge tells Pellet Mill Magazine that GPS is in its final stage of commissioning and will soon be in operation. He says groundbreaking on the mega-sized pellet mill took place summer last year. “It’s known that it is very difficult is to achieve 100 percent of production capacity during the first years of operation,” Monge says. “Because of that, Prodesa is going to be in charge of the operation and maintenance of the plant for reaching the nominal capacity, reducing the operation costs and teaching the local staff the best way to run the plant according to our experience.”
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NORTHBOUND FREIGHT: Essentially all of GPS's 120,000 tons of wood pellets will initially be shipped more than 2,500 miles north from the East Malaysian state of Sarawak on the island of Borneo to South Korea.
GPS produces an industrial white pellet. “The target is to obtain an 11 or 12 grade,” Monge says. The destination of all these pellets is more than 2,500 miles north through the South and East China Seas to South Korea. “In the short term, all the production will go to South Korea because they are working hard for the environment and adopted a renewable portfolio standard (RPS) regulation that requires the increased production of energy from renewable energy sources,” he says. “In the midterm, it is expected that other countries in the area take the same kind of policies, increasing their wood pellet consumption.”

According to the U.S. Energy Information Administration, in late 2012, “South Korea experienced several incidents of falsified certificates for components of some of its existing nuclear power plants, adding to the industry’s distress following Japan’s Fukushima nuclear disaster in 2011. The South Korean government shut down four reactors temporarily, and another six were offline for maintenance, removing up to 40 percent of the nuclear capacity from service until the government inspected all reactors. Nuclear power generation fell by 10 percent from 155 terawatt hours (TWh) in 2011 to 139 TWh in 2013 before rebounding to 156 TWh in 2014. The country’s current long-term energy plan, released in early 2014, lowered the share of nuclear capacity to 29 percent of total generating capacity by 2035 from the previous goal of 41 percent by 2030.”

The EIA says South Korea plans to promote renewable energy to reduce its carbon dioxide emissions by 37 percent from business-as-usual projected levels in 2030. Its RPS went into effect in 2012 and, while renewable energy only made up 4 percent of the nation’s electricity generation in 2014, according to the Korean Energy Economics Institute, renewable energy production in South Korea is on the rise.

Inside the Plant

Back on the island of Borneo, for GPS to meet its 120,000-ton nominal capacity of industrial-grade white pellets per year; the facility will process about 175,000 tons of wet raw material annually. Monge says the feedstock will be mainly waste. “Sarawak state has a large wood-based industry generating enormous amounts of wood waste,” he says. “The surplus wood waste from the nearby factories, which is not being utilized, gives the opportunity to reuse what would otherwise be timber residue into new products.” The waste comes in the form of slabs, chips, sawdust, veneer and plywood residues made from Acacia and tropical wood.

The plant contains three FrommStols-brand pellet mills, delivered and installed by Prodesa, that Monge says are designed to allow for installation of an additional pellet mill to increase production further, if the owners see fit. Monge says the chopper is an undisclosed Asian brand that produces sawdust from the raw material in one step. Prodesa has installed several different conveyance systems according to the different needs of the process. “Mainly chain and belt conveyors, but also a pneumatic system at some point,” Monge says.

The drying system employed at GPS is a unique design, “one of the first of its kind in Asia.” Monge says. Designed and manufactured by Prodesa under Swiss Combi license, it’s a belt dryer that uses hot water at around 100 to 110 degrees Celsius to dry the raw material. “As it’s an indirect low-temperature drying process, the main advantages compared to drum dryers are the safety, the low level of emissions, and the quality of the obtained product, maintaining all the chemical properties of the lignin,” he explains.

On the backend, the plant includes a jumbo bag loader and a container tilter for direct bulk loading.

Eyeing the Market

Over the past several years, Prodesa...
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has built, or is in the process of building, seven pellet mills in different parts of the world, Monge says, four of which include combined heat and power. In addition, the company has participated in several other projects with its drying line. And apart from that, Prodesa continues to perform feasibility and engineering studies for other possible plants. Even though Prodesa has conducted project engineering for another pellet mill in the region, along with biomass drying work, GPS is its first complete pellet mill project in Asia.

"The first plant in an area is always a bigger challenge," Monge says, "but all of them are different in some part. You need to be flexible and adapt your design to the local characteristics."

While Pellet Mill Magazine attempted to speak with the joint venture partners of GPS, they deferred comment to Monge at Prodesa until the plant is fully operational. On CellMark's website, the company touts its commitment to preserving Malaysian wildlife and the environment by its adoption of an orangutan at the Semenggoh Wildlife Center named Roxanne.

"CellMark's commitment to the environment and surrounding wildlife species does not stop at the adoption of Roxanne," the company's website says. "It goes way beyond that with the company's plans to build a 120,000-ton a year mill to produce renewable energy in the form of wood pellets. The raw material used in the pellet-making process is the residual from other wood processing plants in the area and the same raw material will be used to power the mill, giving it a very low-carbon footprint. The first mill called GPS is just the start. CellMark's intention is to build additional capacity in the area to get to the level of 500,000 tons of renewable energy pellets in Sarawak while looking for other potential sites in Indonesia and Thailand."

Monge says he was transferred to the region after Prodesa analyzed the market from a distance, and a branch office was established. Monge says he attends various regional events and participates in local biomass forums trying to get a better understanding of the markets and possibilities, searching for clients and local partners to work with.

"It's a growing market, young, active
and with a big potential in the biomass sector," Monge says of Southeast Asia, "but in the end, every market is difficult and has its own characteristics." Two of the challenges Monge says he is facing in the region are dealing with short-term mentalities and less-than-desirable industrial habits.

Monge says one of the main characteristics of Prodesa is that it gets "very involved in the projects," he says. "We don’t just install the plant. We want the plant working and the client satisfied. In fact, as I said, we are going to be in charge of the operation and maintenance of the plant for two years." He says while the possibility of Prodesa owning a small equity position of GPS never arose, the company is open to an ownership stake in other projects.

"We hope that all the eyes looking at this plant realize that it’s an interesting business and also positive for the environment and local population, making it the first of many," Monge says.

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THREE’S NOT A CROWD: Green Pallet (Sarawak) features three pellet mills made by Promill-Stolz, delivered and installed by Prodesa. The design allows for incorporation of an additional mill as demand for its industrial-grade pellets grows in Asia.

PHOTO: PRODESA.