First wood pellets from Sarawak's largest plant

In mid-December the first pellets came off the production line of Green Pellet Sarawak, awaited new wood pellet plant. Located in the Malaysian state of Sarawak on the Island of Borneo, the 120 000 tonne-per-annum capacity plant boasts a number of firsts for the region in addition to being one of the largest pellet plants.

As many industry observers and players have projected for quite some time, South East Asia is rapidly emerging within the biomass to energy space. Interest in biomass and wood pellet production and consumption is growing. Countries like China, Malaysia, Thailand and Vietnam are pushing production whereas China, Japan and South Korea are driving demand.

A recent example of the former is the new 120 000 tonne-per-annum Green Pellet Sarawak (GPS) facility, one of the largest in the region. A joint venture between Sweden-based international forest products trader Cellmark, Sarawak Timber Industries Development Corp., and Derasas Jaya SBD, a private, local investor and wood industry owner it will use residues from neighbouring wood industries. The target is to produce ENplus 12 quality and in the short term the production will be exported to South Korean and Japanese utilities. In the longer term the plant could service the needs of local utilities in Sarawak or mainland Malaysia.

Ambitious challenge

In September 2014, the Spanish company Prodesa Mediambient, a specialist in supplying turnkey pellet plants with the option of biomass cogeneration using organic rankine cycle (ORC), revealed that it had taken on an EPC role for the GPS pellet plant project. Prodesa’s original involvement was that of a technology supplier. However, sometime into the project it was agreed that Prodesa step in to assume an EPC role, illustrating perhaps the lack of local experience and expertise compared to other regions where there are many wood pellet plants. A decision described by José Ignacio Pedrazas, Business Manager North America in September 2014, as an “ambitious challenge” necessary to meet the competitive demands of key Asian biomass markets that “are a long way from home”.

— Prodesa is responsible for developing and executing the project, from engineering to commissioning. All the design of the process engineering and detailed engineering, manufacturing and supply of turnkey biomass drying and pelleting facilities from the reception of products in the plant to the pellets store before its delivery, commented Pedrazas.

Once on-site construction was concluded and permitting of the complete installation was achieved, Prodesa set about the commissioning works of the various processes and equipment. In November 2015 it revealed that it was in the final start-up phase of the plant and in mid-December the first pellets came off the production line.

State-of-the-art

According to Prodesa the main differences in comparison to other pellet plants in the region are found in the process philosophy and equipment set-up. The focus is on plant safety, availability and low production costs. The plant is highly automated, designed for round-the-clock operation with minimum scheduled stops to ensure a clean and safe plant that can operate for many years.

The plant receives a variety of feedstock materials from the nearby wood industries. This includes rejected logs, veneer trims and prefect cores, plywood offcuts, log offcuts, slabs and other wood waste generated at sawmills and plywood mills. Two independent chipping lines, each with a screen and hammer mill line, handle different kinds of raw materials and ensure both material in-feed security and correct particle size. This is necessary to obtain an optimal performance in the downstream dryer and pelleting processes.

The heart of the plant, and a core competence for Prodesa, is the dryer island, key to achieve the required pellet quality and production objectives. The GPS plant has a European style low temperature belt-dryer with a second layer recirculation system. A feature of low temperature belt-dryer technology is low thermal and electrical energy consumption and consistent moisture content of the output material. Designed and manufactured by Prodesa under Swiss Combi license, the dryer uses water at 105 °C for the drying process. According to Prodesa it is the
first-of-a-kind installation in Asia.

A single dry product hammer mill has been installed post-dryer to reduce the size of the dry product before it is pelletized. This stage is especially important when producing industrial pellets for co-combustion in plants where pellets are pulverized prior combustion. From here the material is transported to an in-feed buffer and homogenization silo for the pelleting line, which currently consists of three 355 kW Promill peller presses with space for a fourth press. The pellets are stored in a large vertical silo from which pellets can be loaded into an automatic jumbo-bag line or directly into containers for sea transport.

Importance of O&M
As has been highlighted in several pellet conferences, compared to other industrial processes it is seemingly few pellet plants that manage ramp up to nameplate capacity within the specified timeframe. Indeed there are plants that have yet to reach their nominal capacity.

Borneo

Covering an area of 743,330 km², Borneo is the third largest island in the world and shared by three countries: Indonesia, Malaysia and Brunei. Forest industries and oil palm are two major industry sectors. Since 2007 some 229,000 km² of forest in the centre of the islan is closed as nature reserve by a tri-lateral agreement between the countries. However deforestation remains as a serious issue.