

Spain's renewable energy sector is suffering since the country's government cancelled all aid in a bid to cut its public deficit

# Success in tough times

**S**pain has a public deficit of over \$37 billion (€28.5 billion). In order to cut this to zero within eight years, the government suspended subsidies for all new power plants using renewable energy at the beginning of 2012. This cancellation of political aid means new renewable energy projects are taking much longer to reach completion, with a few ceasing construction altogether.

However, Spanish pellet production grew during last year; existing plants began expanding and new, more efficient plants came under development.

One Spanish project which was unaffected by the lack of subsidies was a pellet production and CHP plant in Huerta del Rey, Burgos. Ribpellet developed the facility and engineering company Prodesa supplied much of the equipment, including the de-barker, drum chipper, wet hammer mill, walking floors, belt dryer, intermediate storage silos, dry hammer mill, pelletising line, pellet mills, bagging and pelletising machine and pellet silos, in addition to all the conveyors connecting the equipment.

Talking about the biomass sector in Spain Prodesa's sales engineer Luis Alonso says: 'The market is growing. The demand during this year has increased and most of the plants are selling 100% of their pellets and don't have to produce under request. Last year more than 250,000 tonnes were sold under the A1 ENplus license and the data for this year will be higher. The challenge this year will be achieving capacity.'

Ribpellet broke ground on the facility towards the beginning of last year and it was fully commissioned by October. Today the plant is working at full capacity, producing around

8 tonnes per hour, or 55,000 tonnes per year, 5.35MW of heat and 1.32MW of power.

Prodesa's ability to design the whole plant, 'from logs to pellets', made it a suitable technology supplier in Ribpellet's eyes. 'A pellet plant is more than just different machines installed together,' Alonso explains. 'It is critical to design the whole plant according to the production requirements in order to achieve the final production.'

He adds: 'Additionally, we manufacture the dryer system which is the heart of the plant. It is important to properly control the drying process as this determines the quality of the pellets. We manufacture in Spain under Swiss Combi license.'

The equipment supplied by Prodesa makes up six categories:

## 1. Wood yard

Ribpellet's plant receives a variety of materials for its pellets, including logs, woodchips and bark, and as a result Prodesa's design features three different systems to handle these feedstocks. And, in order to achieve optimal performance during the drying and pelletising process:

- Bark must be removed before pelletising, thus a de-barker has been installed
- Material must be smaller than 15mm at the drying inlet. This requires several machines, the first being a drum chipper, to produce woodchips from whole logs.

The de-barking process is important to reduce ash content; wood pellet specifications state that ash content must be below 3%. According to A1 ENplus certification, it must be below 0.7% for domestic applications and under 1% in industrial applications, in the most restrictive case.

The drum de-barker is fed by a horizontal conveyor which receives the logs from the feed decks.

De-barked logs are discharged onto a horizontal discharge conveyor which transports the logs to the drum chipper. Below the de-barker, a chain conveyor takes out the removed bark. The drum chipper is installed to produce woodchips from logs as the raw material must be reduced to the required size at the drying system.

## 2. Wet milling

Moisture content is a large contributor to pellet quality. Prior to drying, the woodchips are screened. The suitably-sized chips are separated from those which are too large, with the bigger ones sent to hammer mills for further size reduction into microchips.

## 3. Drying island

The drying island is the 'heart' of the plant and key to achieving the required pellet quality.

Three options are presented by Prodesa: ecoDry, an indirect high temperature dryer; drum dryer, a direct high temperature dryer; and a belt dryer, an indirect low temperature dryer.

The drying process uses a hot gases flow which soaks up the moisture in raw material into the dryer. As Ribpellet installed a CHP ORC biomass cogeneration system, the selected dryer was a belt dryer, which uses the hot water from the ORC cooling system.

While bark cannot be used to manufacture wood pellets, it can be burned in the biomass furnace, increasing the feasibility of the production facility.

The 5.35MW of heat generated in the CHP unit is used in this drying process, while the

1.32MW of electricity are sold to the National Grid.

## 4. Dry product intermediate storage

The drying process reduces moisture content to 8-10% and the woodchips are then transported to dry product storage by several chain conveyors. Ribpellet is able to store up to 2,850m<sup>3</sup> of dry product.

## 5. Milling and pelletising

In this penultimate stage the woodchips are dry and ready for the pellet press. Here, two processes occur: a) Dry milling: to reduce the particle size below 3mm b) Pelletising: the produce the final wood pellets.

## 6. Pellets storage

Prodesa's storage system is able to load trucks or railcars. Ribpellet installed a truck loading system with a capacity of up to 50 tonnes/hour.

Looking to the future, Alonso says the European market must be ready for increased volumes of pellets coming from overseas: 'The pellet market is growing across all of Europe and further afield. For industrial pellets, the plant size is bigger than for domestic. The European market will need over 2 million tonnes of industrial pellets to power the existing coal-fired power plants and most of this quantity will arrive by boat from other countries such as North America.'

From its US office in Atlanta, Prodesa is developing a number of long-term projects (over 250,000 tonnes/year capacity). 'These new North American plants will help to supply the future European request for industrial pellets,' Alonso concludes. ●