

STELLAR PERFORMER CUTS COSTS AND EMISSIONS

At the end of 2013 Polish pellet producer Stelmet overhauled its heat energy flow system from the biomass boiler to address a seasonal production bottleneck. By investing in a novel flue-gas condenser not only has the heat capacity issue been resolved, particulate emissions have been reduced too.

HEADQUARTERED IN ZIELONA GÓRA southwest Poland, Stelmet sp. z o.o. S.K.A is the nation's largest producers of garden landscape architecture items made from softwood. The company has five production facilities in Poland that between them cover the entire production process; from log purchasing to packaging of finished products. In 2008 the company commissioned a new 144 000 tonne per year pellet facility at its Zielona Góra wood processing site.

—The demand for pellets is constantly increasing and so are the requirements set out by consumers and boiler producers. They desire pellets with the highest possible energy content. Size, colour, crumble, moisture, ash, contaminants and specification compliance all play a role in driving competition between producers to provide better quality at a lower price, surmised Zygmunt Stanula, purchasing director for Stelmet, adding that its Olimp brand was currently the only Polish produced pellet brand that was ENPlus A1 certified.

Cut costs and improve quality?

Stelmet decided to tackle this price-quality chal-

lenge by investing in technology that would reduce production costs and possibly improve pellet quality.

—It is somewhat ironic that the production of this heat energy carrier can consume a considerable amount of thermal energy, mainly by drying woodchips, philosophised Zygmunt Stanula describing his "aha" moment to find a solution that would provide performance and efficiency improvements, a belt-dryer.

—The driver for this investment is of course energy saving but there are additional pellet quality attributes, which allow us to fully recommend low temperature belt drying as a technology. Operating in the 100°C temperature range we avoid burn marks as well as tar and flue gas contaminations. The lignin remains in the chips which improves the pelleting process. And we reduce energy consumption which results in cost savings, said Zygmunt Stanula.

Winter capacity constraints

However Stelmet also pursued additional improvements that would see even more effective utilization of energy.

—The main incentive was our need to resolve a significant production problem we faced with operations in winter, revealed Zygmunt Stanula.

Stanula explained that the 10.5 MW thermal rated VAS biomass boiler supplies 7.95 MW of heat and 1.76 MW of electricity is generated using a Turboden ORC unit. For much of the year it was sufficient heat to operate the kilns for wood drying, the Stela belt-dryer for woodchips as well heat the office and production halls. The problem occurred when the ambient air temper-

ature dropped below 10°C as then the kilns consumed a substantial amount of heat to bring the temperature levels up to working parameters. With maxed out boiler capacity tough decisions had to be made on when and where to limit production to reduce heat consumption.

—Not good as production costs for limited output increase, potential income margins decrease and the staff go cold, said Stanula.

Energy recovery

Observing that there was a significant amount of heat being constantly lost literally going up the flue-stack, Stelmet decided to invest in a novel technology. The company installed a heat recovery system based on a flue-gas condenser from Swiss based SaveEnergy.

—Utilization of a condenser allowed the filtering out of particles from the flue-gas on top of its principal design feature which is heating water droplets, commented Adam Sitko, business development manager for SaveEnergy.

The result is that 45 percent of heat energy or 4 MW is being recovered and utilized. This is fully sufficient to supply heat required by belt dryers for pellet production allowing the primary heat from the boiler to be utilized by other consumers. The outgoing flue gas temperature from the stack has dropped from around 200°C to 40°C and the previous winter peak is now no longer a concern.

Text: Alan Sherrard

Photos courtesy: Adam Sitko

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