

*zenon's contribution to renewable energy in Poland*

# Polish biomass innovators choose zenon

Over 5% of energy produced from renewable sources in Poland is managed by Polish Energy Partners S.A. (PEP S.A.), and biomass boilers are an important part of this. When Biomasa Energetyczna Południe Sp. z o.o. – part of the PEP S.A. Group – acquired land in Ząbkowice Śląskie in the special economic zone in Wałbrzych in 2009, they planned to build an advanced biomass pellet production plant which would utilize innovative processes and technology.



Producing energy from pellets helps Poland to fulfil EU carbon directives, improve national energy security and protect the consumer from the rising prices of fossil fuels. To improve performance, new methods to enhance production are continually sought that will produce a product with a high calorie value at the lowest possible price.



Visualization and control of the rending machine - for shredding of raw material.

## PARTNERS WITH PROVEN PERFORMANCE EFFECTIVE CONTROL

PEP S.A. selected ANIRO Engineering Sp. z o.o. as the main contractor and construction began on the Ząbkowice Śląskie site in 2009. ANIRO were selected because they had previously worked with PEP S.A. on a similar joint project for a prototype straw pellet plant in Sępólno Krajeńskie. That plant pioneered an innovative process which eliminated the traditional drying line – instead using a chemical bonding process to manage the moisture content of the raw material. The new plant in Ząbkowice Śląskie would operate using the same patented chemical drying method.

ANIRO managed a staged implementation which included all wiring, switchgears, control and display design and implementation. The control system was based on Siemens SIMATIC S7 controls and COPA-DATA's zenon software was selected for the process displays and monitoring.

Paweł Lieder, Control System Engineer at ANIRO Engineering says, "We selected zenon for the project at Ząbkowice Śląskie because the software was the best fit for the demands of the project. PEP S.A. needed a system that would provide stable communication with S7-300 controllers via TCP/IP, allow for the flexible extension of the project by both number of variables and optional modules, including online maintenance, redundancy, alarm management and reporting. It was a huge bonus that using zenon meant we need only a single tool for the creation of both the reporting, SCADA functions and the HMI display system."

The main requirements PEP S.A. specified for the control system were:

- ▶ optimal production process control (with 9 PID adjustment loops) independent of the parameters (e.g. the moisture of the input raw material)
- ▶ creation of a display and control system for operators (HMI) for each key device in the factory
- ▶ creation of a fully-redundant system for the display, control, archiving and analyzing of production data for the control room and senior management

Jarosław Białkowski, Project Coordinator for Process Technology at ANIRO, explains, "Our extensive industrial experience of zenon meant we knew it would meet – even surpass – the client brief. As well as being easy to use in terms of system design and implementation, zenon has a number of features that make it exceptionally easy to use and administer for factory operators too."

The clear menu layout of the zenon application minimizes system training requirements and keeps unnecessary errors to a minimum. The most important production parameters are displayed at all times. For example: the loads of the main drives, efficiency, logged shift, date, time, indication of controller connection and its load.

## UNLIMITED AND IMMEDIATE ACCESS TO PRODUCTION DATA

After a secure log-in, users can see a clear overview and then access detailed information about production parameters, each piece of equipment or drive and transformer station parameters. The status of particular drives can be opened by clicking on the symbol of a given motor. In this manner, the operator can find detailed information on the current operation method, load, speed, and possible errors in the drive. This allows remote disconnection from any of the drives or the entry of a target value for the adjustment loop. One of the display screens indicates the transformer station parameters, enabling the monitoring of active power demand and passive power return.

In addition, the Remote Transport and Remote Desktop functions in zenon give Production Management immediate access to information from every part of the plant and its external workstations – essential for the efficient management of a modern production facility.

zenon's built-in redundancy also means that the monitoring, access to and recording of plant data is completely reliable. Furthermore, the software's pre-configured 'server/ standby server' mode enables the creation of a two-node 'hot-standby' configuration in just a couple of clicks. zenon also supports circular redundancy. In both cases, any loss of data in the event of a failure is avoided. PEP S.A. and ANIRO Engineers find these redundant configurations are also useful during start-up and remote maintenance.

## PLANNED PRODUCTION OUTPUT ACHIEVED

Construction was completed in 2010 and the project completed in Spring 2011. Production then began of the pellets, which are manufactured from grain, rapeseed or miscanthus straw, with the addition of calcium, on twin lines that produce an annual output of 100,000 tons. The pellets are then delivered to other EDF Polska group companies and other Polish power plants.

zenon was instrumental in the plant achieving target output, as ANIRO Display System Engineer, Przemysław Kurowski, explains: "During the installation, we encountered problems typical to the setup of a sizeable plant. As a consequence of production tests, the output of specific drives or their controlling modes were modified; most frequently by enabling continuous speed adjustment. In addition, mechanical tests were performed aimed at increasing conveyor throughput. We solved these issues at short notice, thanks to COPA-DATA's innovative HMI/SCADA technologies and their professional technical support."

## PERFORMANCE ANALYSIS LEADS TO CONTINUOUS IMPROVEMENTS

Ongoing performance analysis means any problems in the lines' operation, such as slipping rollers in the granulating unit – causing an increase in power demand and overheating of the motor without material feed – can be quickly identified. PEP S.A. Group makes use of zenon's Alarm List and Chronological Event List modules to ensure any problems are quickly identified and analyzed. They find the freedom to amend chart and report layouts which zenon delivers is a hugely advantageous for successful monitoring.



Raw material (straw) granulation process..



Reception of the final product.

In addition, PEP S.A. used the Extended Trend module in zenon to view and analyze live and historical performance data. Trend profiles have been prepared for all the major devices in order to facilitate quick reviews of the lines' operating parameters.

“Thanks to zenon's efficient production process management – from practical display and control system, redundancy, ease of maintenance, including remote maintenance, through to in-depth process analysis of real-time and historical data – we are producing top-quality pellets and have achieved our projected performance levels,” says Andrzej Rogulski, Process and Construction Engineer at PEP S.A.'s Biomasa Południe, “What's more, zenon's performance analysis capabilities provide us with a strong basis to further develop and enhance production performance.”

#### THE BENEFITS FOR PEP S.A.:

- ▶ production process controlled 100%
- ▶ real-time production data
- ▶ remote viewing of real-time data
- ▶ transfer of production information to control centre
- ▶ low cost of training new operators
- ▶ higher calorie value of pellets
- ▶ ability to plan production process
- ▶ cost reductions
- ▶ prevention of unexpected breakdowns
- ▶ cost control and planning