

## **SCADA at heart of carbon neutral CHP project**

Austrian city Lienz provides its citizens and businesses with cost-efficient environmentally friendly heating and electricity from wood and solar energy. At the heart of the network is a modular boiler control system.

Austrian city Lienz is home to one of the most cost efficient and environmentally friendly district heating networks in the Tyrol region.

Currently around 50 km long, the network will eventually be extended an additional 7km. At that point, approximately 950 properties will be supplied throughout the year with environmentally friendly, low-cost heating from a combination of wood and solar energy. Its final capacity will provide a heating output of 74 million kilowatt hours.

To provide this, two thermal power stations will primarily generate the required energy from biomass furnaces and solar power. A buffer storage with a capacity of 400 m<sup>3</sup> intercepts load peaks from the district heating network and enables smooth operation of the biomass heating systems. The additional oil boiler is used only to provide support at periods of particularly high demand and supplies less than five per cent of the total thermal energy during normal operation.

The system was installed by Kohlbach, a company with a long track record in the supply of CHP and district heating technology in the region.

The district heating system was delivered in two stages. The Lienz 1 heating power station uses: two biomass boiler systems: a hot water boiler with a rated power of 7 MW and a thermal oil boiler with a rated power of 6MW; one organic Rankine cycle (ORC) process that supplies 1 MW of rated electrical power; one solar plant with 630 m<sup>2</sup> surface area of collectors; one exhaust gas purification plant, carried out in a first stage by a multi-cyclone downstream of each biomass furnace and in the second stage by a shared exhaust gas purification plant including exhaust gas condensation; and two oil boilers.

The second stage uses: one biomass boiler system with attached thermal oil boiler for a rated power of 8.7 MW; one ORC process with a rated electrical power of 1.5 MW; one exhaust gas purification plant with integrated exhaust gas condensation; a round timber shredder with automatic fuel feed; and buffer storage with a capacity of 400 m<sup>3</sup>.

The success of the system is highly dependent on boiler system control and, for this, Kohlbach selected zenOn SCADA/HMI software from Copa-Data of Italy.

### **Modular SCADA is best**

One of the reasons why Kohlbach uses zenOn is the modular nature of the software. Managing director of Copa-Data, Thomas Punzenberger, elaborated: "With zenOn, you just buy the modules you need. These interface directly into zenOn, so there is no need to overspecify."

Managing director of the Kohlbach Group, Zvonimir Preveden, commented, "Standard zenOn modules such as Extended Trend and Archive quickly convinced us that we had found the right partner in Copa-Data. They simply make our job easier and our products safer."

"Indeed, the potential of the software is still not exhausted," added project technician Hartwig Streit. "The network control and complete exhaust gas purification in projects such as the Lienz thermal power station are also visualised with zenOn."

The zenOn archive server continuously records and archives all process data. Each archive can contain any number of, and any type of variable (binary, analogue, string) and these can be stored spontaneously, cyclically or event driven.

Kohlbach uses the archive module primarily to record boiler temperatures. The extended trend functionality is then used to analyse the trends in temperature to ensure that the operator uses the boiler within the specified parameters. This is very important to Kohlbach because its boilers are installed with a conditional lifetime guarantee. A boiler will normally operate for many years, but if permitted to overheat

the damage would void this cover.

The extended trend module is used to analyse trends in temperatures, for example if a boiler is tending to overheat, or is running at maximum efficiency. This data can also be used for improved plant optimisation over the coming years.

As the Lienz plant is fully automated using zenOn and hardware control, a single supervisor may be responsible for a number of plants in a district, with no operators on site. This makes effective message control very important.

The message control ensures that alarm messages and system information in the Lienz district heating plant arrive quickly to the operating personnel – regardless of whether the station is currently manned or not. The built-in message control forwards condition and alarm information immediately to the right recipients.

When operators are not logged in on site, this could use SMS, pager, fax, email or as a voice message on the telephone. The sending of messages can be triggered manually or automatically when a threshold is violated or according to a time control.

For example, in the event of a boiler overheating, the supervisor could receive a text message or a voice message. Regular reports, such as alarm logs or temperature trends could be sent by email. All messages are documented and archived.

### **A soft logic experiment**

Systems such as that installed by Kohlbach at Lienz rely on using future-oriented systems and technologies. One technology that the company is carefully watching is the emergence of the 'soft' PLC. With this in mind, Kohlbach is experimenting with the proven soft logic solution named STRATON from Copa-Data. This technology integrates completely with zenOn to produce what the company describes as an elegant, cost effective and above all, safe solution.

The powerful and flexible STRATON programming system is embedded within the zenOn development environment. STRATON is a fully IEC 61131-3 compliant “soft” PLC that supports all five languages defined in the IEC standard - AWL, ST, KOP, FUP and AS. It comprises the workbench (the programming interface), a runtime (the runtime environment) and a communication system. A series of performance enhancing and useful programming features facilitate rapid, pain-free project development.

Engineering time is reduced using an integrated zenOn and STRATON system because the SCADA/HMI system and soft PLC share a central database of variables. Any variable declared in zenOn is available in STRATON and vice versa. This makes project commissioning more efficient because the variables are only declared once, rather than separately in both the SCADA and PLC programs like in a typical process control system.

With these and many other features, zenOn makes the control and monitoring of plants simple and safe. Kohlbach is currently upgrading the Lienz district heating plant from zenOn 5.5 to zenOn 6.2 to make use of the powerful improved multi user editor and automatic project creation wizards, both of which promise to improve project commissioning times for the company.

Commenting on the Lienz project, Mr Punzenberger said: “It’s a pleasure to know that our software ensures monitoring and safety in such innovative and powerful products.”

*More information: [http://www.copadata.it/no\\_cache/en/home.html](http://www.copadata.it/no_cache/en/home.html)*