A natural choice

In southwest Sweden the municipality of Mölndal has made its largest environmental investment ever with a new district heat and power plant that runs on biofuels and relies on ABB motors and drives.

Text: Susanna Lindgren, **Photo:** Svante Örnberg

Riskulla, the new combined heat and power district heating plant, is a shiny landmark of glass and aluminum located on the outskirts of Mölndal, a municipality in southwest Sweden. One by one, large trucks enter the automated fuel reception point to deliver their cargo of chipped branches from certified forests in the area (or, as a secondary source, of peat). This climate-neutral biofuel will produce 350 GWh district heating, which can heat 25,000 households in the municipality and annually produce 130 GWh electricity. To balance any surplus or shortfall, heat is traded with neighboring Gothenburg and electricity is traded on the Scandinavian electricity market, depending on supply and demand.

The power plant has been in operation since autumn 2009. An ABB Business Center is located just half a kilometer away, and that proximity to service and aftermarket, in addition to years of good cooperation, are the reasons why Riskulla chose ABB as its supplier for motors, variable-frequency drives and the control system for the plant, ABB System 800xA.

"The construction involved 46 different tenders," explains Jan Brännström, Head of Business Development at Mölndal Energy and Project Director at the plant. "This made it necessary for us to be involved in the choice of pumps, motors and other equipment to minimize the amount of suppliers. Preferred suppliers were therefore listed in the terms of the project."

Even if the investment in motors and drives is less than one percent of costs in a plant of Riskulla's size, the drives create energy savings of up to 80 percent compared to using throttle valves and guide vanes to adjust the flow of air and water.

The largest item supplied to the Riskulla plant was the bubbling fluidized bed (BFB) provided by Metso Power AB. Mikael Berg, Project Manager at Metso Power, says, "ABB motors are the benchmark for good machinery in the industry, and we have had good experiences all over the world working with them and the variable speed drive equipment. At Riskulla, their selection of ABB motors and drives gave us a large control range and possibilities to run on very low power output and still keep the plant stable."

During the warm season the plant is running as long as there is a need for district heating. Brännström says, "Regardless of capacity used, the efficiency of the plant is always more than 90 percent."

The boiler room at Riskulla is a building several stories high, with a glass wall that reflects daylight into an intricate labyrinth of shiny metal piping that transports fuel, water, steam, flue gas and combustion air in the right directions. The interior of the hot, orange furnace is visible only through a round inspection glass four floors up. For every fan, pump, conveyor or other motor application there is a drive fit to size, depending on power requirements. The drives themselves are gathered in switchgear rooms.

"These machines are good," says Riskulla's Stefan Anderson, Head of Maintenance, as he unlocks the door to the room that contains the largest drives. "Even if the drives require adjustments and tuning during startup, they all work just fine in production."

There have been very few problems at Riskulla, Anderson says, and the minor obstacles that initially occurred were quickly solved. "This proves the importance of a good aftermarket and the advantage of getting good help and service when it's needed," he says.

Building the Riskulla power plant cost more than 160 million U.S. dollars, a huge investment for a small municipality such as Mölndal, which has approximately 60,000 inhabitants.

Facts

Riskulla power plant

ABB delivered the following:

- More than 100 motors, from the very small up to the 1.4MW motor for the flue gas fan
- Driving pumps, fans, conveyors, screen shakers and crushers
- More than 60 variable speed drives, installed on all motors requiring speed control and on all motors above 75kW
- The integrated control system, ABB System 800xA