

Flue gas analysis and control

EON Power Company, Örebro | Sweden



Gaining complete control of flue gases.

Measurement made easy

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Introduction

EON Power Company in Örebro, Sweden has complete environmental control, from the chip stacks to the emitted flue gases. Flue gas analysis systems from ABB provide continuous information about each component in the flue gas.

“We started planning for flue gas analysis two years ago,” says Per Lundmark, project manager for the instrumentation projects at EON Värme in Örebro. “The project team decided to revise and improve the analysis systems of all boilers in the CHP-station, with one exception – Biofuel boiler 5. This boiler already had the ABB ACF-NT flue gas analysis system installed in 2006. This system supports analysis of twelve gases”.

“For the new Bio70 boiler we again looked at FTIR based CEMS. It’s relatively expensive,” says Lundmark, “but offers highly sophisticated solutions. After a thorough investigation, we selected an ABB ACF-NT system for Bio70, similar to that for Boiler 5. For the smaller peak load boilers we selected the ABB continuous gas analyzers of the Advance Optima series.”

“We consider it important to always know what the boiler is emitting from the stack, both for environmental permits and for our own environmental control. Good overview of emitted gases also makes it easier for operators to detect malfunctions,” says Lundmark.

“Another important factor in the selection of this system was availability and support. The new boiler must work continuously –24/7 – as does the flue gas analysis system. Over the past several years, ABB has provided excellent customer service and fast access to technical support for the system on Boiler 5,” says Lundmark.

For more information

Further details for the ABB Measurement & Analytics product portfolio are available for free download from:

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Firing underway

Smoke from the boilers flows up a 85 m stack. Boiler 5, fed with wood chips and peat, provides district heating and electricity on a grid. Before commissioning, the new Bio70 boiler will be fired and its operation tuned. Its new flue gas analysis system has been installed close to the stack. The same room contains the analytical system for Boiler 5.

“The large cabinets with analytical equipment receive flue gas from an ABB designed sampling system for analysis with sensitive instruments,” says Lundmark. “The cabinet door displays raw data from the Bio70 boiler emissions – 10 mg NOx per cubic meter and 180 °C flue gas temperature.”

Fiberoptic cables deliver the analysis results to the boiler control and environmental systems. “We procured the system, including installation, from ABB,” says Lundmark. “The service technicians hired from One Nordic in Örebro, have done a very good job, both for the new ABB system and for other installation jobs. The systems are communicating on lightning-safe fiber cables and we have information from all boilers at the same time,” he says.



“From wood chip stacks to flue gases, EON in Örebro has complete environmental control,” says Per Lundmark.

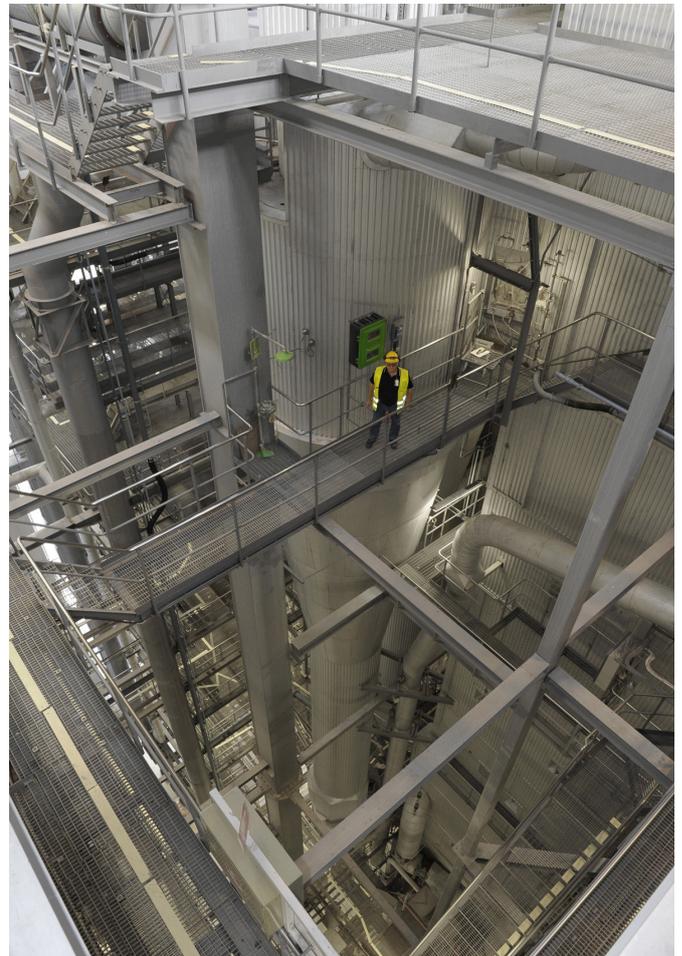
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Conformance requirements

The environmental system converts the raw data into usable information. Environmental engineer Marie Ström has complete overview of emissions from boilers. She explains that the “Åbyverket” CHP-station must fulfill both general environmental requirements and special conditions specified in the business environmental permit.

We report emissions including nitrogen oxides, sulfur dioxide, dust and carbon monoxide regularly to the municipality,” says Ström. “Measurements performed by our flue gas analysis systems must occur within certain, sometimes short intervals. Otherwise we will be fined. So the systems must be reliable.

Over the years,” says Ström, “Åbyverket has remained well below the limits for all emissions. So,” she says, “will the new boiler. We expect ABB’s flue gas analysis systems to continue to provide efficient environmental control.”



Facts

EON Värme Sverige (EON Heat Sweden part of the Eon Group)

Operates Åbyverket in Örebro, which has three boilers for power and one hot water boiler. Capacity is about 510 MW for heating and 106 MW of electricity. EON is currently investing almost a billion Swedish kronor (US\$150 million) in a new biofuel boiler Bio70 of 70 MW. It is expected to reduce carbon dioxide emissions by 84,000 tons per year, equivalent to emissions from 28,000 gasoline-powered cars.

ABB

ABB has delivered several flue gas analysis systems to Åbyverket. The new biofuel boiler Bio70 has an FTIR based system ACF-NT, configured for communication with EON's environmental systems and ammonia analyzers for process measurement values. Contracts are all on a turnkey basis.



Johan Pettersson and Jimmi Landin, technicians from One Nordic AB and Marie Ström, environmental engineer at EON, have also been working with the new flue gas analysis systems from ABB.

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ABB AB

Measurement & Analytics

Tvarleden 2

721 59 Vasteras

Sweden

Contact: Martin Ottosson

Tel: +46 21 34 21 51 or

+46 70 65 53 022

Email: martin.ottosson@se.abb.com

abb.com/measurement



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