CASE STORY

Aalborg WHR boilers: from pure waste to pure energy – for free

Tornio, Finland

Not only is Finnish Outokumpu one of the world's leading producers of stainless steel, it is a leader in sustainable production as well: the products produced at Outokumpu's stainless steel plant in Tornio, Finland are typically composed of 90% recycled content. After the company installed two of Alfa Laval Aalborg AV-8N waste heat recovery boilers, the energy generated by two of the plant's walking beam furnaces is being recycled as well.

In 2004, Finnish energy services company INESCO OY contacted Alfa Laval Aalborg Oy about a proposal for flue gas waste heat recovery from Outokumpu's walking beam furnaces in the Tornio steel factory. The project would be financed according to the ESCO concept of zero upfront investment, with payment based on energy savings over a 4-year period.

"We gathered and examined the data, and came up with a proposal and detailed specifications for a complete system. An Aalborg AV-8N waste heat recovery boiler would be placed out-side the factory, directly behind the furnace. It would recover heat from furnace flue gases. That heat would then be used in district heating for the plant," says Alfa Laval Aalborg's Pasi Aaltonen. "Outokumpu signed a contract and we got to work."

Smooth process. Perfect timing

"We worked directly with Alfa Laval Aalborg on the technical portion of the project," says Anne Kärki, manager of technical services in Outokumpu. "It went well in terms of timing. It was a good project for us: it was profitable in terms of energy savings."

Throughout the installation process, Alfa Laval Aalborg followed the schedule of the plant and completed the installation without interrupting production processes. Connections to existing flue gas ducts were made during the planned annual service period.

One successful system leads to another

The first installation was commissioned in 2005. Satisfied with the first system, Outokumpu signed a contract for a waste heat recovery boiler to recover heat from a second furnace shortly thereafter, and the second installation was commissioned in 2006.

"We're happy with the system," says Anne Kärki. "It provides approximately 20% of the energy for district heating in the plant."

Good for the environment too

Outokumpu has reduced CO2 emissions by 25% per produced ton over the past decade. The Aalborg AV-8N waste heat recovery boilers played a significant role in this reduction by recovering maximum 10 MW of energy from waste flue gases that would have otherwise gone directly to the stack.

No unscheduled maintenance The Aalborg AV-8N waste heat recovery boilers have also proven to be reliable. They have been in operation since 2005/2006 with no unplanned maintenance. “The system was designed to allow flue gases to bypass the boilers if needed, but so far there has been no need due to boiler failure,” says Anne Kärki. “Although we have used the bypass option for other reasons, for example in the summer when we don’t require heat. In terms of maintenance, routine maintenance has been sufficient.”

A recommendation

I would certainly recommend Alfa Laval Aalborg and the Aalborg waste heat recovery boilers,” Anne Kärki continues. “The project went well, the schedule was well planned and the results have been good.”

The second Aalborg AV-8N WHR boiler at the Tornio plant.

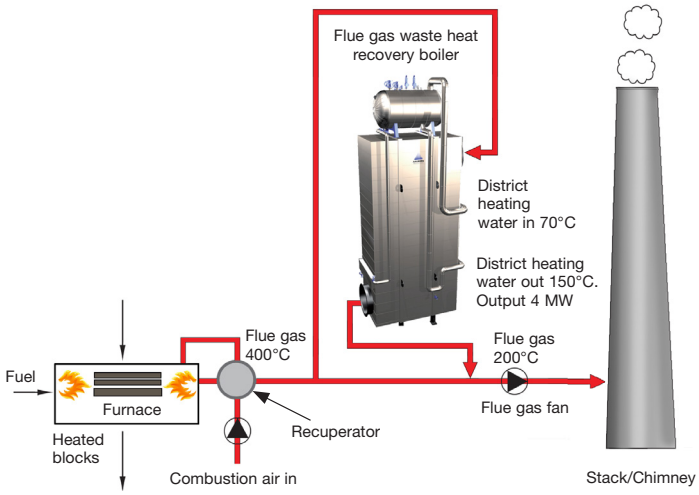

Illustration of a reheating furnace in a steel factory with a high efficiency process flue gas (PFG) heat recovery solution.

About the solution

The Alfa Laval Aalborg AV-6N is a robust, highly efficient waste heat recovery boiler that improves a plant’s total efficiency.

With the Aalborg AV-6N, waste heat from flue gas is recovered from sources such as industrial processes, diesel and gas engines or gas turbines, in order to generate steam and/or heated water. The solution ensures flexible operation and is easy to install – even at existing facilities.

Fast facts

The challenge

Finnish energy services company INESCO OY needed a reliable and experienced partner to design and supply waste heat recovery systems for two walking beam furnaces in Outokumpu’s stainless steel plant in Tornio.

The solution

The Aalborg AV-8N waste heat boilers, which are installed behind two of Outokumpu’s walking beam furnaces, recover waste heat from the flue gases to heat water for use in the plant’s district heating system.

The benefits

- Savings in fuel costs of approximately 480,000 euros per year
- Reduction of CO_2 emissions
- Reliability and no unplanned maintenance

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