



The Norfors plant is owned by five municipalities (Hørsholm, Allerød, Fredensborg, Elsinore and Rudersdal) in the northern part of Zealand in Denmark, covering a population of approximately 200,000 inhabitants. Nordforbrænding contracted Babcock & Wilcox Renewable (B&W) to supply a new waste-to-energy line that was completed in 2016.

The new waste-to-energy line is based on our Vølund™ NextBAT® technology, which is designed for high energy recovery and low emissions. The R1 value is actually more than 100% above the threshold value of 0.65. After completion of the new furnace line 5 in March 2016, the plant produces heat and power from lines 4 and 5 only and replaces the existing three worn down lines from 1969 and 1989. The existing furnace line 4, from 1998, will remain in operation.

### **Facts: New furnace line at Norfors**

- The new combined heat and power-producing waste-to-energy line is designed for burning 10 tonnes of waste per hour and operates independently from the other lines.
- The plant's energy efficiency has increased from 70% to 99%.
- Together, furnace lines 4 and 5 are able to process 152,000 tonnes of waste annually.
- With the new furnace line, Norfors is able to produce double its production of electricity and 30% more district heating.
- The plant's electricity production has reached 80 GWh/year, corresponding to the electricity consumption of 15,000 detached houses.
- The plant's heat production has reached 370 GWh/year, corresponding to the heat consumption of 25,000 detached houses.
- The new boiler can process several types of fuel other than waste, such as biomass and sludge. This means that the plant is future-proof and can be used for energy supply and waste treatment in several ways.

*continued* ►

## Scope of Supply:

- Our DynaGrate® combustion grate, unique in its fuel flexibility, optimised combustion and minimal maintenance costs
- A multi-pass boiler
- VoluMix™ system forms a complete burnout in the gas phase by injecting air into the combustion zone
- An ash treatment system
- An advanced NO<sub>x</sub> treatment technology



Norfors is located in the middle of Hørsholm, a northern suburb of Copenhagen, and has been accepted by the neighbours as a good solution to waste management and energy supply.

Plant design data (per line)		
Process parameters	Guaranteed values*	Units
R1 value	1.33	
Waste capacity	10	t/h
Heat value, lower	12.5	MJ/kg
Steam output	43.6	t/h
Steam temperature	400	°C
Steam pressure	50	Bar
Gross Electric Output	7.5	MW
District Heating Output	22.9	MW
Boiler outlet flue gas temp.	160	°C
Feed water temperature	130	°C

Flue gas values:** Before cleaning	Guaranteed values*	Units
NO <sub>x</sub> ***	100	Mg/Nm <sup>3</sup>
CO***	10	Mg/Nm <sup>3</sup>
NH <sub>3</sub> ***	5	Mg/Nm <sup>3</sup>
TOC	5	Mg/Nm <sup>3</sup>

\* All values refer to 11% O<sub>2</sub> dry gas

\*\* The plant limit values comply with the EU Directive on Waste Incineration. Naturally, the plant is equipped with a modern flue gas cleaning system.

\*\*\* 24-hour average

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