

# I/S REFA KRAFTVARMEVÆRK - Nykøbing Falster, Denmark

VØLUND™ WASTE-TO-ENERGY TECHNOLOGY - CHP PLANT

PROJECT CASE HISTORY

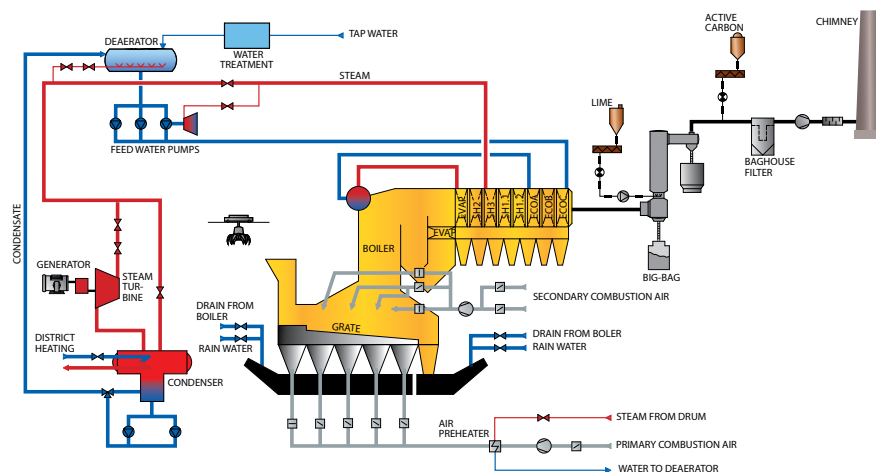


The I/S REFA waste incineration plant in Nykøbing Falster, Denmark, about 120 km south of Copenhagen, is jointly owned by 13 municipalities.

The company handles all collection and treatment of waste from the 13 municipalities and has approximately 65 employees.

## Collection of waste

The company collects and treats all kinds of waste from households and industries on the two islands of Lolland and Falster, a total of about 200,000 tons/year. The majority of the waste is either combusted or recycled.



continued ►

## Combined heat and power plant

The first part of the waste-to-energy plant was built in 1983, and consists of lines 1 and 2, each with a capacity of 4 t/h. The lines are equipped with hot water boilers for supply of district heating to the city of Nykøbing Falster. They are in operation throughout the heating season and also function as back-up for line 3. The lines were completely renovated in 1998-99.

By 1995-96 the amount of waste had grown considerably, and a third line with a capacity of nine t/h for generation of electricity and district heating was planned. This combined heat and power line went into commercial operation in 1999, and now supplies the district heating requirement of the city in cooperation with lines 1 and 2 (740 TJ/year). In addition, line 3 supplies electricity (50 GWh/year) to the public electricity grid.

## Residual products

The bottom ash from the three lines (approximately 20,000 tons/year) is recycled in the construction industry. The fly ash (approximately 3,000 tons/year) is collected in big bags, which are sent to Norway for use as an acid neutralisation agent at a waste-to-energy plant.

### Main data (for the third line)

Nominal capacity	9.0 t/h at 12 MJ/kg
Max. cont. capacity	10.8 t/h at 10 MJ/kg
Steam data	40 bar, 400°C
Steam generation	35 t/h
Electricity generation	6.7 MW
District heating generation	18.9 MW
Flue gas cleaning	Semi-dry scrubber with baghouse filter

### Flue gas values: Out of boiler (for the third line)

		Limit value acc to permit	
CO	mg/Nm <sup>3</sup>	100	
TOC	mg/Nm <sup>3</sup>	10	
Particles	mg/Nm <sup>3</sup>	30	
SO <sub>x</sub> (as SO <sub>2</sub> )	mg/Nm <sup>3</sup>	300	
HCl	mg/Nm <sup>3</sup>	50	
		Measured values	Measured values
		Nov. 2001 *	Feb. 2002 *
CO	mg/Nm <sup>3</sup>	<4	<4
TOC	mg/Nm <sup>3</sup>	<3	<3
Particles	mg/Nm <sup>3</sup>	<0,1	<0,1
SO <sub>x</sub> (as SO <sub>2</sub> )	mg/Nm <sup>3</sup>	7	<1
HCl	mg/Nm <sup>3</sup>	2	1

All values apply at 11% O<sub>2</sub>, dry flue gas

\*) Mean value of two measurements

The plant limit values comply with the EU directive on waste incineration.

## Babcock & Wilcox

Falkevej 2  
DK-6705 Esbjerg Ø  
Denmark  
Phone: +45 76.14.34.00

[www.babcock.com/volund](http://www.babcock.com/volund)    

The information contained herein is provided for general information purposes only and is not intended nor to be construed as a warranty, an offer, or any representation of contractual or other legal responsibility.

Vølund is a trademark of The Babcock & Wilcox Company or its affiliates.



RENEWABLE | ENVIRONMENTAL | THERMAL

Established in 1867, Babcock & Wilcox is a global leader in renewable, environmental and thermal technologies and services for power and industrial applications.

For more information or to contact us, visit our website at [www.babcock.com](http://www.babcock.com).