

Waste-to-energy plant

Högdalen Stockholm, Sweden



New waste fired power plant – the largest plant yet undertaken by Babcock & Wilcox Vølund

On 5 July 2002 AB Fortum Värme in co-ownership with the city of Stockholm signed a contract for the building of a new waste-to-energy line, P4, at the plant in Högdalen.

The plant capacity

With a combustion capacity of 37 tons waste an hour (9.2 MJ/kg) Högdalen P4 is the largest single unit yet undertaken by Babcock & Wilcox Vølund.

Apart from the large capacity, the Högdalen unit is characterized by flexibility. The plant is capable of burning municipal solid waste (MSW) and industrial waste – mainly refuse derived fuel (RDF).

The nominal capacity of the plant is 34 t/h waste at a heat value of 10 MJ/kg, corresponding to approximately 275,000 t/year.

The boiler generates 115 t/h steam at 36 bar, 400°C.

BWV's supply

By using a combination of new and proven technology, this waste-to-energy unit has been designed to fit into a small space between the existing units at Högdalen.

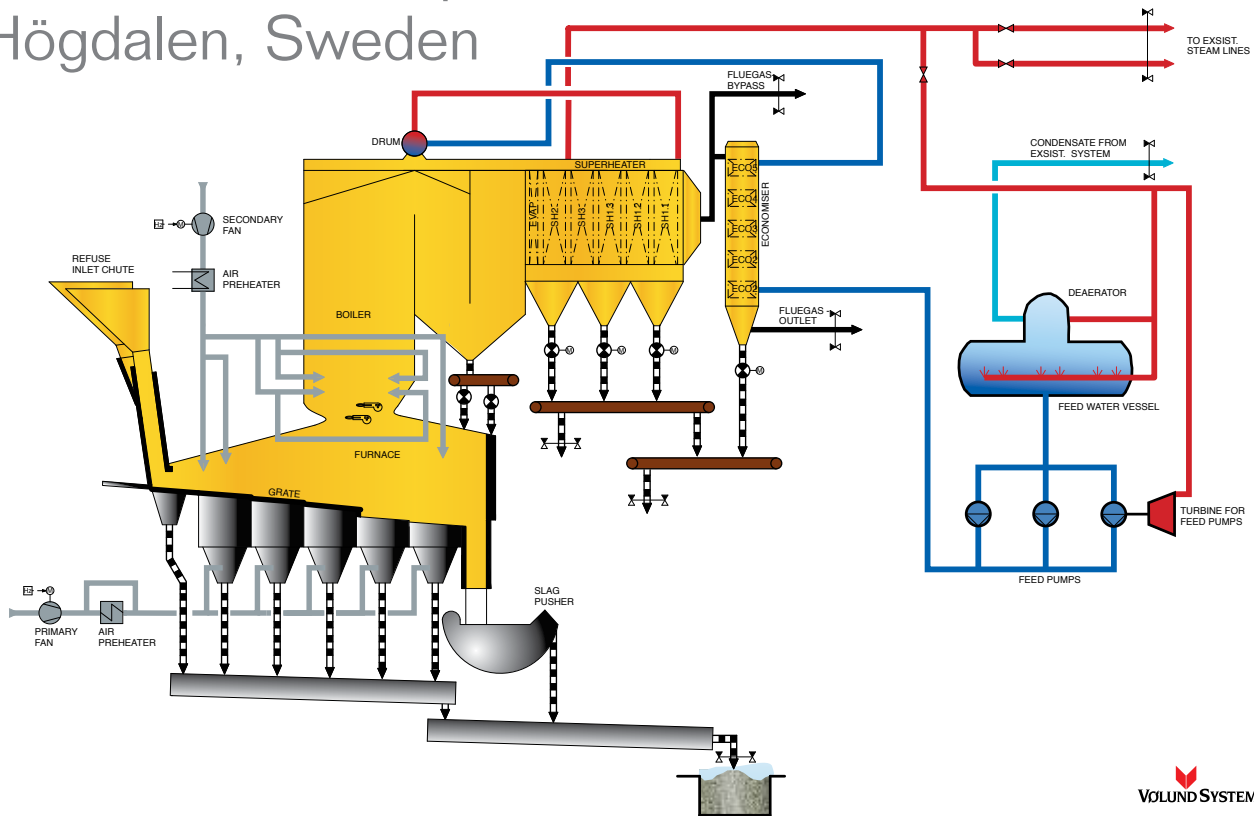
BWV's supply includes a furnace/boiler with economiser, a complete ash/slag system and a system for transportation of fly ash from the boiler rear pass. Furthermore, a DeNO_x plant (dosing of ammonium to the first boiler pass) and a complete electrical and DCS system is included. The building structural steel is also part of the supply.

The grate is a combined water and air-cooled Vølund grate. The waste will be supplied through a water-cooled feeding chute into a fuel pusher, thus ensuring homogenous feeding without the risk of backfires.

The new plant supplies steam to two existing steam turbines.



Waste-to-energy plant Högdalen, Sweden



Flexible shifts of fuels in less than 2 hours

The Högdalen plant is designed with flexibility in mind and is capable of burning municipal solid waste (MSW) and refuse derived fuel (RDF). The main fuel MSW is incinerated five days a week and generates a heating value of 10 MJ/kg. Two days a week the plant combusts RDF. The heating value of RDF is 16MJ/kg. The shifts are quick and the entire process takes less than 2 hours.

Inconel® cladding for protection

Inconel® cladding is used to protect the boiler tubes on the first and second boiler passes, while a combination of water and steam blowers cleans the heating surfaces in the second and third boiler passes and economiser.

PDMS and piping

As with other projects, BWV use the design tool PDMS throughout the design and engineering process. Thermal design and PDMS has been a very useful tool in meeting the many challenges; creating the best capacity in a small space between existing units.

Högdalen is the largest plant yet undertaken by BWV.

This also shows in the piping project. The project amounts to a total of 3.4 km of pipes and 6300 pieces.

Högdalen was handed over in March 2006.

Plant design data		
Process parameters	Values	Units
Nominal capacity	34	t/h
Nominal lower calorific value for waste	10.2	MJ/kg
Steam flow	115	t/h
Steam temperature	400	°C
Steam pressure	36	bara
Heat output (steam)	86387	KW

Flue gas guarantees: Out of boiler	Values	Units
TOC	< 2.5	%
LOI	< 4	%
NO _x	< 80	mg/Nm ³ *)
NH ₃	< 8.0	mg/Nm ³ *)
CO	< 50.0	mg/Nm ³ *)

* Hourly average values, 11% O₂ dry flue gas

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

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