

Multi biofuel steam boiler

Strängnäs Energi AB Strängnäs, Sweden



Babcock & Wilcox Vølund A/S was in January 2007 awarded the contract for the supply of a multi biofuel boiler for Strängnäs Energi AB.

The energy produced by the boiler is to be used for high-efficiency electricity production, process steam for neighbouring industries and district heat heating for the town of Strängnäs.

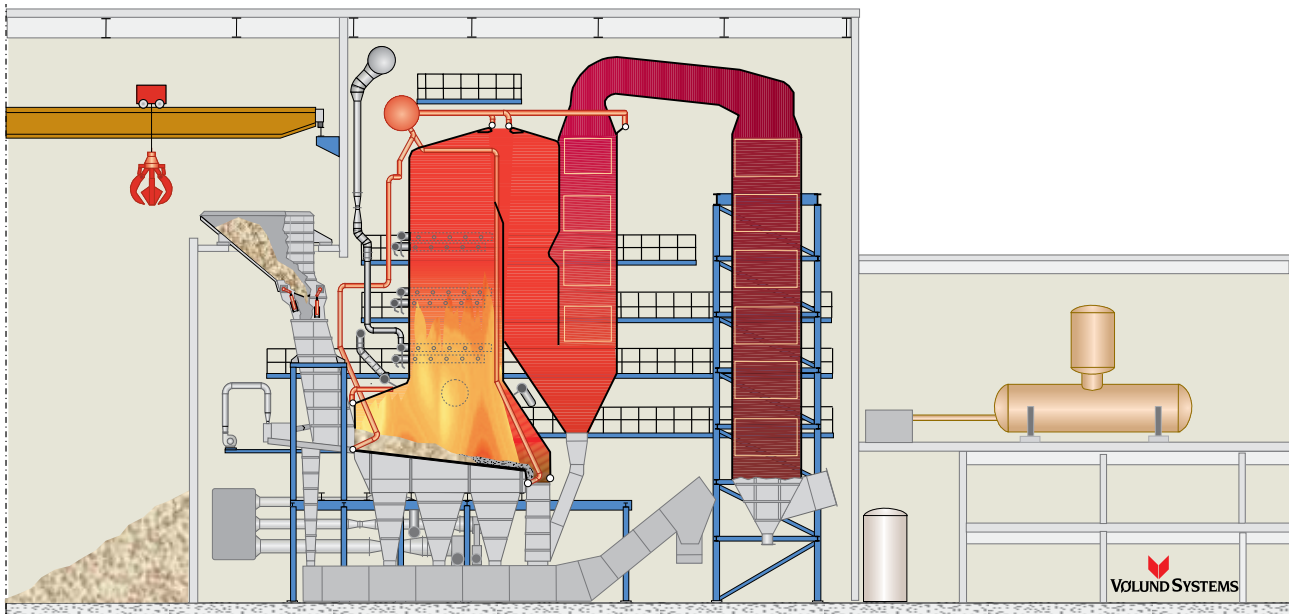
In order to benefit from green certificates for the initial 10 years' operation of the plant, virgin wood (GROT) and waste wood chips are intended as the main fuel. The plant has also been designed to burn refuse-derived fuel (RDF) based on wood, paper and plastic and a fraction of peat. The steam parameter has been adjusted to avoid corrosion in the boiler when burning waste fuels.



The plant is designed to meet future requirements and is capable of burning a wide range of biomass and sorted waste fuels.



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The plant is equipped with a water-cooled vibration grate due to its ability to handle low melting point metals, and this gives low maintenance, smooth operation and superb performance from biomass.

The fuel arrives at the plant in trucks which offload the fuel into the bunker. Two overhead cranes mix the fuel in the bunker and feed it into the boiler hopper. The robust fuel feed pusher system has proved its worth in numerous waste-to-energy plants and makes it unnecessary to screen the fuel for metals or oversize material before feeding it in.

The bottom ash is removed on a submerged chain conveyor with rubber belts to closed containers.

The boiler has two empty radiation passes which cool the flue gas sufficiently before the convection part to avoid clogging the convection pass. The superheaters and economiser are in a vertical arrangement.

NO_x is removed in the boiler with an SNCR plant based on NH₃ water solution injected into the first boiler pass.

Flue gas cleaning consists of a bag filter with lime injection followed by scrubber/condenser for final polishing of the flue gas.

The steam is expanded through a steam turbine with a 13 bara extraction of 7MW process steam. The condensation heat is used for district heating production.

The plant went into operation in November 2008.

Plant design data		
Process parameters	Values	Units
Nominal capacity	36.7	MW steam
Heating values	7 - 15	MJ/kg
Gross calorific value (incl. flue gas condensation)	37	MWt
Total thermal efficiency	90	%
Steam from waste		
- flow	48	t/h
- temperature	427	°C
- steam pressure	72	bara
- electricity	8.35	MWe
Steam from wood		
- flow	46	t/h
- temperature	482	°C
- steam pressure	72	bara
- electricity	8.7	MWe

Flue gas guarantees: Out of boiler	Values	Units
CO	50	mg/Nm ³ *)
NO _x	80	mg/Nm ³ *)
Dust	10	mg/Nm ³ *)
N ₂ O	20	MJ fuel
HCl	10	mg/Nm ³ *)
SO ₂	50	mg/Nm ³ *)
TOC	10	mg/Nm ³ *)

*) The emission values refer to 11 % dry O₂
The plant limit values comply with the waste incineration directive regarding co-combustion.

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