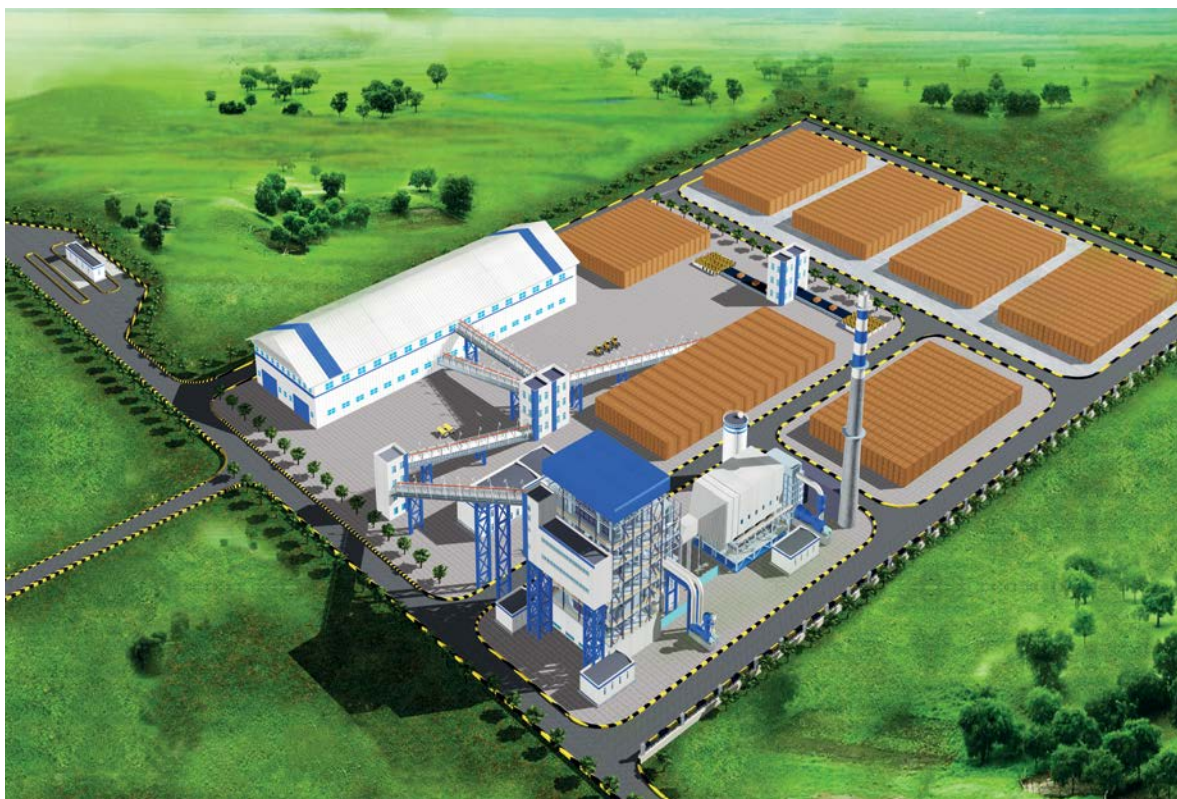


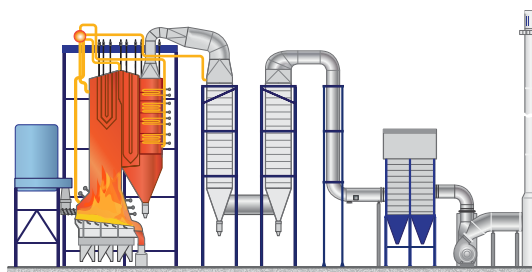
Biomass-Fired Power Plant Packages - Pakistan

VØLUND™ WASTE-TO-ENERGY TECHNOLOGY

PROJECT CASE HISTORY



Under a licensing agreement, Babcock & Wilcox Renewable (B&W) supplied Vølund™ technology to a biomass-fired energy plant at the Bulleh Shah Packaging Limited paper factory. The fuel consists of residues from local wheat straw, cotton stalks, corn, rice and river grass. The plant's steam data is 150 t/h at 530 degrees and 98 bara — enough to secure stability in the supply of steam and power to the factory. A reliable supply of energy is rare in Pakistan. It can be both expensive and challenging for the factory when power fails. Concerning the necessary investment and the choice of supplier, Harri Taipale, Deputy Project Director, in Bulleh Shah said: "It's not profitable to run a paper factory with an unstable energy supply, such as is the case now in Pakistan. Through the investment in the biofuel plant and the cooperation with Runh Power Corp. Ltd. and B&W, we get a reliable and cost-effective energy supply for our paper and board production."



Scope of supply

- Design of the boiler and the concept for the plant
- Vibrating grate
- Design review
- Construction and commissioning advisors

continued ►

Vibrating grate

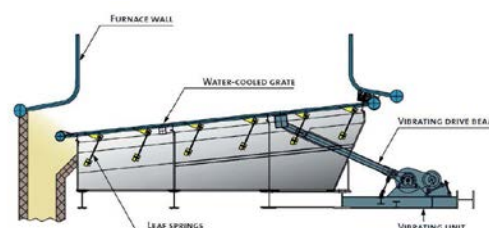
B&W's Vølund water-cooled vibrating grate has proven to be robust and highly efficient since 1990. The grate was specifically developed for fuels with little or almost no ash content, but also works very well with fuels containing ash. It is distinguished by a very high degree of utility, low maintenance costs, and minimal wear on components.

As standard, the grate panels are supplied with water from the boiler drum and act similar to other evaporating surfaces in the boiler pressure part. Other high- or low-pressure cooling cycles can be adopted in order to optimise your overall plant performance.

Data Plant Design		
Process Parameters	Values	Units
Nominal fuel capacity	37.7	t/h
Fuel calorific values	9.5 – 16	MJ/kg
Steam flow	150	t/h
Steam outlet temp.	530	°C
Steam pressure	97	barg
Feed water temp.	180	°C
Boiler efficiency	91	%

The vibrating grate is ideal for burning most types of biomass, RDF and other solid fuels.

- Suitable for a wide range of boilers, 10-170 MW
- Can burn fuels with high-moisture content
- Efficient water cooling results in less wear and ensures a long operating life
- Air flow through the grate can be optimized as there is no need for air cooling
- High availability, low maintenance costs and low consumption of spare parts
- High flexibility due to multiple water cooling options



Emission Guarantees	Values	Units
NO _x	510	mg/Nm ^{3*}
Dust	30	mg/Nm ^{3*}
SO ₂	900	mg/Nm ^{3*}
TOC in ash (max)	10	%

* The emission values refer to 6% dry O₂

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