

GENERAL DESCRIPTION

MODERATELY USED 50 Hz, 135 MW OUTPUT BIOMASS POWER PLANT FOR SALE

Type:
Biomass Fuelled
Steam Power Plant

Location:

Western Europe



This thermal power plant, commissioned in 2003 and commercially commenced in 2004, is designed for base-load or medium-load operations with feed-in into the 50 Hz public grid.

The unit was constructed for both biomass (wood chips) and peat firing, with successful full-load tests on both. The use of lignite coal is also deemed feasible. When using a new boiler, this plant may also be run with hard coal.

The filter technology comprises bag-filter dedusting as well as additive injections and fulfils the latest environmental standards. Additional flue gas denitrification is available, too.

This plant will have to be shut down by end 2020 due to the early termination of the current operating permit. Due to its moderate use (110.000 operating hours only) and its continuous supervision and maintenance it is still in excellent condition.

Offering

item / type / layout	complete CFB boiler + steam turbine-generator power plant for sale with all installed auxiliary systems
typical usage	ideal for base load electricity production
special features	circulating fluidised bed type boiler with tri-fuel capability: - solid biomass (e.g. wood chips) - peat and/or - lignite coal (after modifications)

status	currently in operation; to be mothballed by end of 2020
availability for dismantling	as of early 2021, subject to sales contract and approved dismantling concept
sales prices	Euro Mio. for all re-usable components (as these are and where these are in site)
new build cost (for comparison)	Euro from 230 to 260 Mio. (approx., European base cases for an entire new plant) Euro 200 Mio. total contract cost in 2002, with Euro 120 Mio. equipment cost in 2002
new build time (for comparison)	2 - 3 years (approx., European base cases with new items purchased, depending on permissions granted)

Key Figures

main fuel type	any solid fuel type fitting the CFB steam generator / boiler
electrical output	135 MW _e net capacity (approx.)
thermal output	not foreseen; no CHP configuration
efficiency	38 % (approx., depending on fuel and boiler configuration)
flue gas filter technology	- SO_x max. 200 mg/m³ - NO_x max. 200 mg/m³ - fly ash max. 30 mg/m³ - outdoor noise 55 / 45 dB(A)
grid connection	110 kV, 50 Hz
plant size	approx. 38,000 m ² total surface, incl. fuel storage yard approx. 250 m x 150 m with current layout

year of commissioning	2003 commissioned / 2004 commercial operation
last overhaul	2018, including turbine valve inspection
major upgrades / events	none reported / continuous commercial operation from 2004 until 2020

Operating Figures

max. generation capacity	135 MW _e net (approx., at full load)
min. generation capacity	48 MW _e net (approx., at minimum load)
cold start time:	approx. 12 hours (to reach max. capacity) approx. 4 hours (from grid synchronization to max. capacity)
fuel quality	various low calorific, solid fuels are possible, e.g. lower heat value range: 5 - 15 MJ/kg total ash content range: 2 - 10 % moisture content range: 20 - 65 % volatiles range: 60 - 70 % Sulphur content range: 0.11 - 2.25 % Chlorine content range: 0.01 - 0.10 %
fuel consumption at full load	approx. 45 kg/s at maximum load to boiler (if fuel at 7.7 GJ/kg is used) annual consumption: approx. 1.25 Mio t (for base load operation)
fuel consumption at min. load	approx. 69 t/h solid fuel (if fuel at 7.7 GJ/kg is used)
fuel storage capacity	8.500 t solid fuel
type of cooling	river water circulation

amount of cooling water 5,300 kg/s (19,000 t/h)

Technical Figures of Main Components

This power unit for sale comprises a 400 t/h circulating fluidised bed steam generator, a 150 MW condensing steam turbine, a 182 MVA generator, related components of the water / steam cycle, all transformers and all installed auxiliary systems.

fuel handling

1x coal / biomass handling yard
with fuel feeding capacity approx. 170 t/h
by European manufacturers

1x lorry weighbridge from 0 to 60 t
3x lorry unloaders (in parallel configuration)
2x rail wagon tipplers (for 2 wagons each)
1x belt sampler (automated)
3x belt weighers
4x rotating screws (for reclaiming fuel from stockpile)
1,200 meters conveyor belts

conveyors feed to smaller storage hoppers (day-silos) with
storage capacity approx. 400 t

boiler

1x CFB type boiler, 110,000 operating hours
by European manufacturer
life steam flow: 111 kg/s
steam data: 165 / 33 bar; 560 / 560 degree C
fuel fed to the boiler at a max. of 45 kg/s
steam drum weight approx. 61 t
total boiler weight approx. 2.000 t

supplementary fuel supply for the boiler:

gas Propane ignition system to 5x start up burners + 2x duct
burners

light fuel oil system (Diesel system) supply to 5x start up
burners + 2x duct burners

light fuel oil system (Diesel system) to auxiliary boiler

light fuel oil tank & Diesel pumps

	fresh air supply for the boiler: 1x primary air fan 1x secondary air fan 1x recirculation fan flue gas system from boiler: 2x 162.5 m³/s ID fans (motors 2 MW, 17.5 t each) 1x bag cleaning system – 5,400 bags as of 2018
steam turbine	1x 152 MW nominal, HP extraction type steam turbine by Japanese manufacturer 92% turbine efficiency approx. 110,000 operating hours
generator	1x 181.7 MVA with circuit breakers by Japanese manufacturer 3000 rpm (50 Hz) 11,5 kV approx. 110,000 operating hours
water / steam cycle and cooling system	amongst others: 1x condenser, with 19,000 t/h cooling water 2x 4.5 MW main boiler feed pumps 2x main condensate pumps 3x 1.5 MW (50%) main cooling-water pumps 5x HP stop / control Valves for turbine 38x HP feedwater valves
transformers and electrical supply	1x 175 MVA main step-up transformer from 11.5 to 110 kV by European manufacturer 1x 20 MVA, 11.5 kV / 6.6 kV step-down transformer 1x 2 MVA, 10.0 kV / 6.6 kV step-down transformer 4x 2 MVA, 6.6 kV / 0.4 kV step-down transformers 3x 1 MVA, 6.6 kV / 0.4 kV step-down transformers multiple 6.6 kV and 400 V operation unit boards
control and communication system	1x DCS by European manufacturer

auxiliary systems

1x LFO-fuelled auxiliary boiler (6.0 bar / max 190.8 degr. C)
1x 650 kVA Diesel engine generator
1x compressed air supply system
1x water treatment plant (for demin. water and for condensate)
1x 80 t main hoist crane
1x 12 t aux. hoist crane
selected workshop equipment

Additional Information**spare parts**

extensive spare parts for all plant items included
(with original purchase price of Euro 4.13 Mio.)

documentation

extensive engineering and construction documentation as well
as full operating / maintenance instructions included

marketing service fee

will be paid by the seller

dismantling of unit

shall be borne by buyer; technical assistance by seller
negotiable

work be carried out under safety supervision by seller

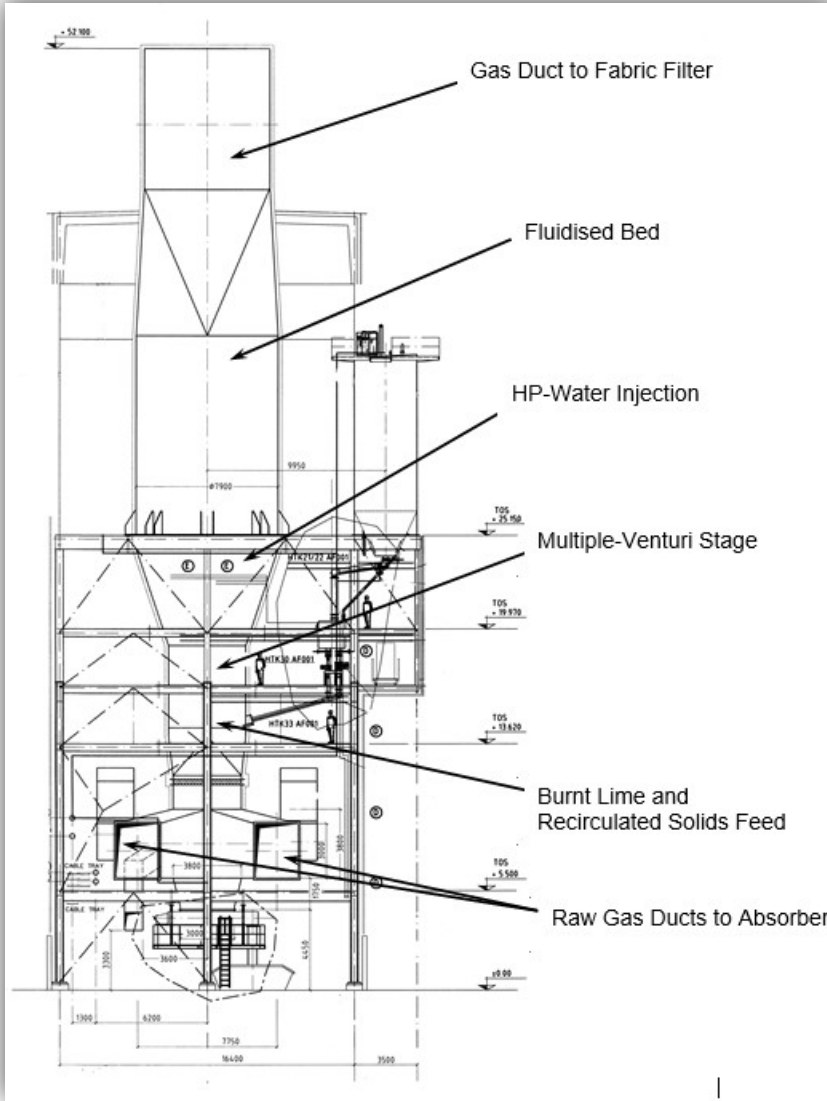
Impressions



plant side view – fuel-feeding system in front of the boiler house



plant inside view – steam turbine / power generator set



side view sketch drawing – CFB type boiler

Disclaimer:

Although the statements and technical information contained herein are believed to be materially accurate, no representation or warranty is given as to the accuracy of any of the information provided.