

sation plant. Here the sulphur dioxide is extracted by exposing the gases to a suspension of limestone and water. The result of this chemical reaction is gypsum.

7 | Flue gas

Before the flue gas is released from the power plant it is thoroughly purified. A minimum of 95 percent of the sulphur dioxide and dust in the flue gas is removed. It is released, via the cooling towers, as purified flue gas.

8 | Limestone

Limestone is required for flue gas desulphurisation process. The finely milled mixture of limestone and water is used in the desulphurisation plant as a reactant so that the sulphur dioxide contained in the flue gas can be bound.

9 | Environment

Rare birds such as common tern and the peregrine falcon breed on the power plant grounds and the towers respectively. The neighboring Peitzer Teiche with aquatic areas provide an ideal habitat for hundreds of grey herons, gulls, swans and white storks.



Power plant data	
Generated capacity	3,000 MW
Output per generating unit	500 MW
Type of firing	pulverised lignite
Mode of operation	base load
Load per unit	180-500MW
Steam boiler	
Steam generating capacity	2 x 815 t/h
Live steam pressure	169 bar
Reheat steam pressure	43 bar
Live steam temperature	535 °C
Reheat steam temperature	540 °C
Number of pulverising mills per steam boiler	6
Turbine	
Type	four-cylinder condensing turbine
Pressure before high-pressure end	163 bar
Temperature before high-pressure end	530 °C
Pressure before medium-pressure end	36 bar
Temperature before medium-pressure end	535 °C
Nominal speed	3,000 rpm
Generator	
Rating	588 MVA
Nominal voltage	20 kV
Frequency	50 Hz
Inductor/stator cooling	H ₂ /H ₂ O
Generator transformer	
Rating	600 MVA
Primary voltage	420 kV
District heat supply from cogeneration	
6 stations	each 58,2 MW _{th}

Products	
Electricity	for over 6 million households
Heat	for households and enterprises in Cottbus and Peitz
Treated groundwater	for regulating the water balance of the Spree
Ash	for construction industry and for securing opencast mine
Gypsum	for the building materials industry
Fish	partner of a fish-farming company of the region

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**Energy
from Lusatia**

Jänschwalde
lignite fired power plant



The Jämschwalde lignite fired power plant

The supply of electricity and heat around the clock and under all weather conditions are ensured by the plant. It lies about 15 kilometers north of Cottbus and has a total capacity of 3,000 megawatt (MW). Around 22 billion kilowatt hours (kWh) are fed into the public grid annually.

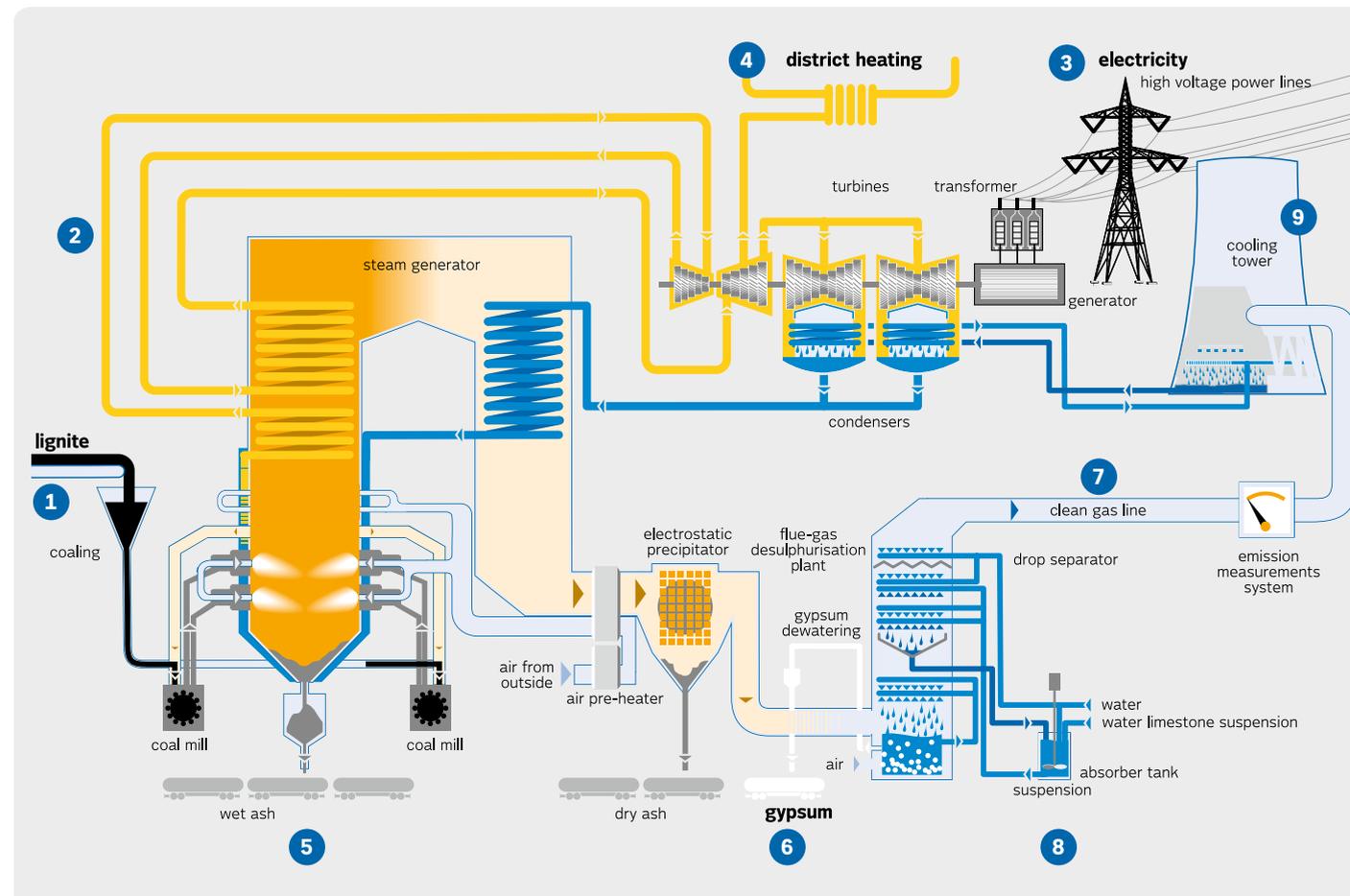
This is enough to supply more than 6 million households with electricity.

For years Vattenfall has been consistently modernising and reducing their carbon dioxide emission of their lignite power plants. Approximately two billion Euros have been invested since 1996 in the Jämschwalde site alone. Comprehensive environmental retrofitting measures were carried out in the 1990s, on the units which were commissioned between 1981 and 1988.

With retrofitting the fluegas desulphurisation facility, the refurbishment of the steam generator for low NO_x combustion of lignite and with the modernization of the electrostatic precipitators for dedusting, the power plant lies considerably below all required environmental limits. With the energy transformation efficiency increase there was a reduction of CO₂. This creates a saving of more than three million tonnes per year when compared to 1990.

The modernisation of all steam turbines, in particular, of the power plant are in the current programme. This work will continue until 2014. There have already been increases in the efficiency and a lowering of the specific CO₂ emission per megawatt hour with the new turbine technology.

The 3,000 MW power plant Jämschwalde operates predominantly at base load and thus guarantees the stability of the high-voltage grid. The lignite fired power plant



Schematic diagram of the power plant process

also balances the fluctuations resulting from electricity generated from wind and sun. Each of the six power plant units can be operated flexibly and rapidly within 180 MW to 500 MW.

With this the best preconditions for implementing the Renewable Energies Act (EEG) are met, to preferentially feed electricity from renewable sources into the grid as the act stipulates. The power plant Jämschwalde is a certified plant to take processed waste for co-combustion.

1 | Lignite

At the Jämschwalde power plant electricity is generated from lignite, a raw material mined from the nearby Jämschwalde, Cottbus-Nord and Welzow-Süd opencast mines which is then transported to the power plant by train. Operating at full capacity, the power plant requires 82,000 tonnes per day.

2 | Water

The water needed for the steam generator and for cooling of the power plant comes from the neighboring lignite opencast mines. The water is thoroughly purified at the power plant. Only half of it is needed for the



power plant, the rest is used for stabilizing the water balance in the Spree River.

3 | Electricity

The electricity generated in the power plant is transmitted via overhead power lines to the Preilack transformer station and from there is fed into the grid of the transmission system operator, 50Hertz.

4 | District heating

Lignite is not only used to generate electricity but is also used to produce heat for district heating. Thus the fuel utilization ratio is increased and additional heat does not have to be produced elsewhere, thus reducing the environmental impact.

5 | Ash and Dust

The combustion of coal produces ash and dust. A part of the solid waste residual is used as aggregate (certified ash) in the construction industry and the remaining part is transported into the opencast mine where it serves to establish a gypsum depot.

6 | Gypsum

Gypsum is a product arising as a result of the scrubbing process of flue gases in the flue-gas desulphuri-