



## Lignite-fired power plant with optimised plant technology (BoA)

# CASE STUDY

The world's most advanced lignite fuelled 1,000MW unit has been built by RWE at Niederaußem, Germany. It operates at 43% efficiency reducing CO<sub>2</sub> emissions by more than 1 million tonnes per year. The plant has been in commercial operation since 1 February 2003. The concept for further BoA units (BoA 2/3) was amended based on the achieved operating experience.



## The need for our expertise

RWE has given the state government of North-Rhine-Westphalia an undertaking that it will gradually replace its existing power plants with new units incorporating state-of-the-art technology to reduce the emission of CO<sub>2</sub>. The first step in this power plant renewal programme was the construction of the lignite-fired unit with optimised plant technology (BoA) at Niederaußem, Germany.

## Putting our expertise into action

RWE's engineering and planning team worked through all aspects of engineering and design to create the most modern lignite-fired power plant in the world. The benefits to the station include:

- steam parameters of the boiler increased to 275 bar and 580°C
- net efficiency of 43%
- electrical output of a single unit increased to 978MWnet

- condenser pressure reduced and the cooling tower optimised
- flue gas waste heat utilised for combustion air and boiler feed water preheating
- turbine efficiency improved through advanced steam turbine design
- all process steps precisely dovetailed to minimise energy losses in the power plant to an economically reasonable minimum
- power consumption of all auxiliaries reduced.

State-of-the-art engineering was used for environmental protection and the outcome included:

- burners optimised to keep NO<sub>x</sub> formation to permissible levels
- high efficiency electrostatic precipitators that remove over 99.9% of the dust from the flue gas
- flue gas treated with a lime suspension desulphurisation system, with the resulting gypsum used for the production of construction materials

- the cleaned flue gases discharged via the cooling tower, a separate smokestack is not required
- to minimise noise emission, sound proofing is an integral part of the design
- the coal bunkers and distribution conveyors are completely enclosed for noise and dust control
- the plant was built in 4 years and commissioned in August 2002 on schedule and within budget.

## The difference we made

Our unique experience as a power plant operator allowed us to achieve the numerous efficiency increases, which added up to a quantum improvement in power station efficiency.

The BoA plant is the most modern lignite-fired power plant in the world, with an electric output of 978MW and an efficiency of over 43%. This is significantly higher than existing lignite-fired plant units.

## RWE Power International

Electron

Windmill Hill Business Park  
Whitehill Way, Swindon  
Wiltshire, SN5 6PB  
United Kingdom

Stuettgenweg 2  
50935 Koeln  
Germany

T +44 (0)1793 892900  
F +44 (0)1793 892421

T +49 (0)221 4801300  
F +49 (0)221 4801350

E [rwepi@rwe.com](mailto:rwepi@rwe.com)  
I [www.rwepi.com](http://www.rwepi.com)