

# Avedøre Power Plant



## Ultra Super Critical (USC) Multifuel Boiler



Avedøre Unit 2 (AV2), commissioned in 2001 and owned by Dong Energy, is one of the most efficient, fuel flexible, and environmentally friendly power plants in the world. In addition to generating electricity, the plant also supplies heat to the Copenhagen district heating network. The main plant of AV2 is an Ultra Super Critical (USC) boiler supplied by BWE.

### Multi Fuel Firing System

The USC boiler was originally designed for coal firing. Due to authority requirement, coal was replaced by natural gas and HFO during the engineering phase. In 2003 the combustion system was upgraded to include wood pellets facilities keeping the gas, oil and coal firing capacity unaltered. Consequently the multi fuel firing system offers the unique possibility to utilize coal, HFO, NG and wood pellets as fuels.

The operation has been successful since commissioning and pulverized biomass firing in a USC boiler is now a proven technology. Up to 642.000 tons of wood pellets are used per year giving a boiler load of 73% on biomass corresponding to a fuel input of 585 MW which makes it the largest biomass fired power boiler in the world.

### Burners

It is possible to use the same burners for the different fuels. The tangentially fired boiler is arranged with 4 levels of single circular burners placed at the furnace corners resulting in full control of the combustion and a low thermal load. The air staging is carried out through the burners as primary, secondary and tertiary air and above the burners as Over-Burner-Air (OBA) as well as Over-Fire-Air (OFA). This concept of air staging ensures the low primary formation of NOx.

### Boiler

The boiler is a USC once through tower boiler of the Benson type with single reheat. The furnace walls are designed as membrane walls with helical tubing. By using special materials, it has been possible to design the plant to the very advanced steam data.

### BWE Scope of Supply

In addition to the USC boiler itself, BWE also supplied the following major auxiliary equipment of own design:

- > 16 BWE type 3AG-LN57 Low-NOx coal/gas/oil/wood dust burners.
- > A rotating regenerative BWE air preheater type VIQD 33.5/2700 with a diameter of approx. 16 meters.

### World leader in steam power technology

Burmeister & Wain Energy A/S has specialized in the development and design of advanced steam boiler plants for utility and biomass fired power stations.

Furthermore, BWE designs a wide range of auxiliary power station equipment such as the BWE Low-NOx coal/oil/N-gas/biomass burners, Air Preheaters and Gas-Gas Heaters.

BWE is part of the Italian STF S.p.A. Group.

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### Boiler Specification:

Boiler capacity (fuel input).....	800 MJ/s
Steam Capacity:	
HP-part .....	1,067 t/h
IP-part .....	1,024 t/h
Steam Pressure:	
HP-part .....	305 bar
IP-part .....	64 bar
Steam Temperature:	
HP-part .....	582 °C
IP-part .....	600 °C
Efficiency (at gas firing).....	96.0 %