



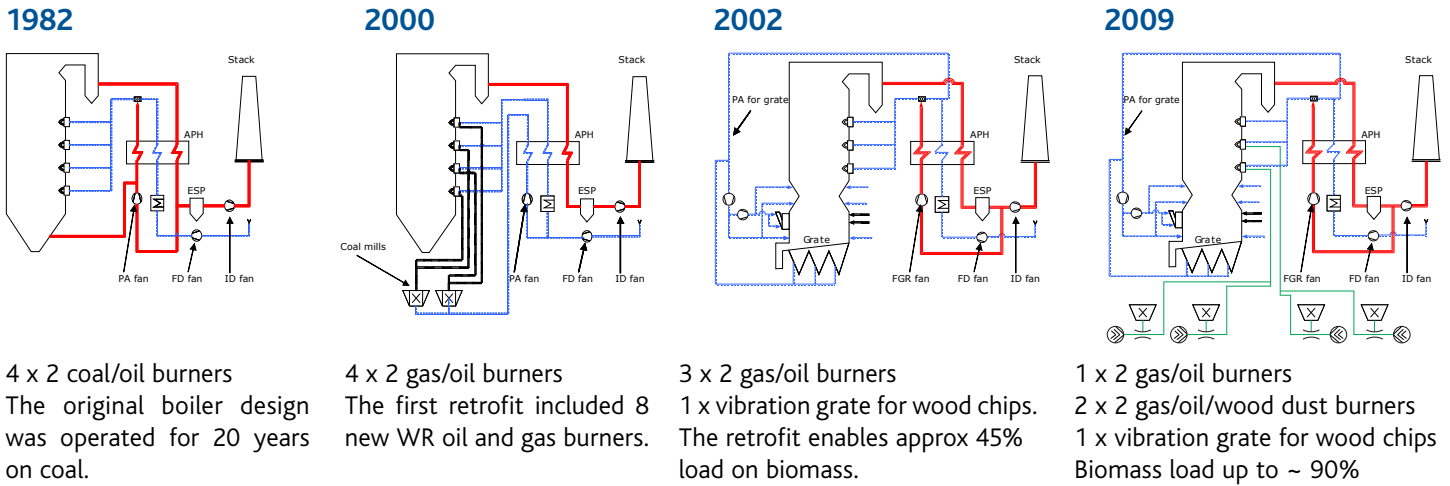
Case stories - BWE Boilers

# HERNING POWER PLANT, DK



# CASE STORIES - BWE BOILERS

## MULTIFUEL CONCEPT - COMBUSTION TECHNOLOGIES



4 x 2 coal/oil burners  
The original boiler design was operated for 20 years on coal.

4 x 2 gas/oil burners  
The first retrofit included 8 new WR oil and gas burners.

3 x 2 gas/oil burners  
1 x vibration grate for wood chips.  
The retrofit enables approx 45% load on biomass.

1 x 2 gas/oil burners  
2 x 2 gas/oil/wood dust burners  
1 x vibration grate for wood chips  
Biomass load up to ~ 90%

In 1982, BWSC (then: BWE) designed and supplied the boiler for Herning Power Plant, a coal and oil fired CHP plant in Denmark. The plant operated on coal up to 2000 when BWSC converted it into oil and gas firing.

In year 2002, BWSC installed a bio grate firing system at the plant, enabling firing of wood chips. The bio retrofit main components comprised:

- A new pressure part design for the bottom part of the furnace
- A vibration stoker grate.
- A booster fan for the secondary air system for the over grate combustion air.
- Extension of the C&I system

The plant is equipped with a shredder capable of making the chips directly from timber, a large storage facility and a reception area with weighing facilities for incoming trucks. The system capacity is approx. 80 trucks per day. The next step in the development of converting the plant from purely fossil firing to mainly biomass firing was taken in November 2008, when Dong Energy awarded BWSC the contract for the supply and installation of 4 multi-fuel Low-NOx burners. The new burners are able to fire NG, HFO and dust from biomass (wood pellets). After the conversion the boiler is able to fire a total of 240 MW from biomass reducing the CO emission of the plant by 325,000 tons/year compared to 100% coal firing.



Vibration grate at test assembly in workshop.

Fuel	1982		2000		2002		2009			
	Coal	HFO	Natural gas	HFO	Natural gas	HFO	Wood chips	Wood pellets		
Steam data	bar	115	115	115	115	115	115	115		
	°C	525	525	525	525	525	525	525		
	kg/s	118	118	118	118	118	118	118		
Max load	%	100	100	100	100	100	100	100		
- with bio*	%			45		~90				
Min load	%	30	30	30	30	30	30	30		
NOx (boiler exit)	mg/m <sup>3</sup> N <sup>**</sup>	650	150	450	225 (N-gas)	450 (HFO)	350 (Bio)	225 (N-gas)	450 (HFO)	350 (Bio)

\* Contribution of max load

\*\*Vol%O<sub>2-dry</sub> for N-gas - 6 Vol%O<sub>2-dry</sub> for other fuels