



## 300MW biomass co-firing plant adopts Halifax Fans

As part of its on-going commitment to turn to renewable sources of energy, Scottish and Southern Energy (SSE) is installing a new 300MW biomass burning system at Ferrybridge 'C' power station. Swedish biomass burning specialist TPS has chosen Halifax Fan Ltd of Brighthouse as the supplier for the primary air fans and the high temperature secondary air and flue gas recirculation fans. Although Ferrybridge 'C' has been burning biomass together with its coal firing (known as co-firing) for some time, this has been limited by the capacity of the fuel mills, since the biomass fuel has had to be ground into very fine particles to burn alongside the pulverised coal in the furnace.



Ferrybridge 'C' showing 'BioSwirl' biomass fuel units

In order to increase its biomass burning capacity, SSE has commissioned TPS to build six new 'BioSwirl' biomass burner systems on each of two boilers. These, when commissioned, will effectively supply 10% of the total energy of the 500MW electrical capacity of each boiler, substituting carbon neutral biomass fuel for

traditional coal and reducing greenhouse gas emissions. Although the system will be commissioned on wood pellets, eventually, SSE will be able to utilise other biomass materials such as olive residue from the olive oil industry.

The first stage in the process is to mill the wood pellets back into sawdust. This is significantly less energy intensive than the very fine milling necessary for direct injection into the furnace. The milled fuel is then transported into the six 'BioSwirl' burners by blowers where, in a cyclonic action,



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 case study



400kW 'Mistral' primary air fan

### Application benefits

- Halifax Fan Ltd's familiarity with the power industry's requirements, facilitated the correct selection of the fans and auxiliary equipment to provide an energy efficient solution for the application.
- High temperature operating environment handling boiler combustion gases.
- Rugged steel construction with heat resistant paint
- Bespoke project from enquiry, through specification design and construction
- Full project compliance and documentation management.
- Performance tested in-house to BS848 Part 1, 1980 Type C

it is suspended and effectively gasified with primary combustion air from a single 3.3kV 200kW high volume Halifax 'Beaufort' fan.

The resulting combustible gas, along with a pre-heated secondary air supply from two additional 3.3kV 400kW 'Mistral' fans, combusts at the outlet from the burner then leads off as a clean, high temperature flame into the furnace itself, supplementing the combustion of coal in the furnace.

Temperature conditions within the 'BioSwirl' unit need to be controlled and a further 110kW 'Mistral' fan unit feeds low-oxygen flue gases back to the burner to 'trim' the combustion if temperatures rise too

high. The secondary air supply fans will be handling air at temperatures up to 280°C and each is fitted with a fibre filled plug unit between the fan casing and the bearing, along with a cooling disk, to prevent excessive heat build-up at the bearings. Similarly, the flue gas recirculation fan, operating at temperatures up to 130°C, is fitted with a cooling disk for bearing heat protection.

Both primary and secondary air fans have been supplied with inlet vane control. According to Michael Morris of contractor TPS "Halifax Fan won the order by virtue of their sound reputation along with a competitive quote.

Speed control of the fans was considered but the required burner running regime did not justify the expense of variable speed drives as adequate flow control could be achieved by equipping the fans with inlet vane control".

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