

Case Study

Biomass Fired Thermal Oil Heater

This 12 MWth output Biomass Power Plant is one of the turnkey products of Biomass Power. The plant was fully commissioned in December 2006. The system has a capacity of 12 MW thermal output producing up to 10MWth of 300°C 10 Barg pressure hot oil, up to 10 tonnes per hour of steam and 2 MWth of 200°C hot air. This is all achieved from one grate heating three separate heat exchanges. The fuels used are waste arising from the production of OSB, Chipboard and MDF, consumed at an annual rate of around 50,000 tons which before the system was installed went to landfill. This renewable energy power station saves around 33,000 tones of carbon per year.



The plant is owned and operated by a global board making company with a \$1-2 billion turnover. A Feasibility study of the project began in 2004, and in December 2005 the contract was awarded. The Biomass Power team expedited the design, build and commissioning of the power plant and the system was connected into the board mill process in December 2006.

The process is well proven and robust. A heavy duty moving floor feeds fuel into the heavy duty reciprocating step grate. The grate gasifies the fuel to produce a volatile gas. These volatile gases are then combusted at above 850°C for more than two seconds to ensure complete combustion.

Once the gasification and then secondary combustion process is completed the hot gas is converted via a water tube design, hot gas to oil heat exchange, high temperature air via gas to fire tube exchanger and hot oil to steam via steam raising boiler. These are then used to meet all of the process heat requirements of the

board mill and vary according to the process needs required for the manufacture of different products at different times.

Once the hot gases are released from the heat exchanges at low temperature they go through a treatment process of dust filtering and dosing with neutralising agents. The flue gas emissions are monitored constantly ensuring compliance with the waste incineration directive.

A SCADA (Supervisory Control And Data Acquisition) system is employed to significantly enhance the plant control and maximise the performance. This highly automated control minimises staffing levels to only 2 during day time and 1 during night time and weekends.

The board producer that made this investment saved upward of £25,000 per week on natural gas using their own waste products as an energy resource. The Biomass Plant has become a key part of the organisations energy strategy.