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Case Study – Sussex Biomass Waste to Energy Plant (under construction)

The 6 MWe Sussex Biomass Waste to Energy plant is a turn-key product designed and engineered by Talbotts Biomass Power under contract with Sussex Waste to Energy Limited (SWTE). The latter will own and run the plant upon commissioning, which is expected in July 2008. The plant will burn a mixture of mainly biomass originated and waste fuels (Demolition Woodchip, Paper & Card, Textiles and PET Based Plastic) at 60,000 tons p.a., producing 44 GWh net electricity to be sold to the grid under contract. The plant is designed as WID complying and will save about 40,000 tons per year of fossil fuels, equivalent to reduction in CO_2 emission of 79,000 tons per year.

The whole plant consists of fuel-storage section, boiler, gas cleaning & treatment plant, residual handling system, turbine & generator set and air-cooled condenser (ACC). The boiler employs a moving step-grate combustor and flue-gas is recirculated to ensure the lowest possible NOx emission. Three successive cyclone combustors are employed to completely burn out volatile organic matter and CO. Steam is produced at 41 bar and 400°C and connected to the turbine to convert the thermal energy into mechanical force and drive the generator. Economiser is positioned at the back of the boiler to recover residual heat in the flue gas and increase therefore the overall fuel-to-electricity efficiency. ACC is employed instead of traditional water-cooled condenser to significantly save water usage. The whole plant is designed in a very-low profile and the roof height lower than 15m.

Best Available Technology (BAT) is applied throughout the designing process and SCADA (Supervisory Control And Data Acquisition) system employed to enhance the plant control and diagnosis quality.

The plant will create 12 full-time job positions and benefit the local environments by turning waste to green energy.