

Western Wood - Wales

14 MW Power Plant



**Completed in 2008 for
Western Wood Energy**



BY



Project Background

Looking for energy-efficient and environmentally friendly solutions of power generation, incentives are introduced on the British market by the UK government, creating the framework for emission reductions while strengthening the national economy and improving environmental conditions.

The call for lower emissions into the atmosphere has led to new market possibilities for private investors and consequently to the design and completion of Wales' first commercial-scale biomass plant in Port Talbot.

The project will generate approximately 110,000,000 kWh clean energy which is enough to meet the needs of more than 30,000 households.

A turnkey contract for the Western Wood Energy Project was awarded to a consortium of Burmeister & Wain Scandinavian Contractor A/S (BWSC) and Aalborg Energie Technik A/S (AET) in April 2006.

In addition to establishing a secure and sustainable energy source, the contract owner, Western Bioenergy, demonstrates a close integration into the regional economy, cooperating with local companies supplying remnants of wood from the area.



Project Description

This tailor-made biomass plant is fuelled by forestry wood and clean, uncontaminated residues from wood processing (chips, logs and sawdust).

The various types of wood are received, stored, chipped and blended before being fed to the combustion plant.

In total, the 14 MWe power plant is consuming about 20 tons of wood fuel per hour in full load operation.

An AET-provided steam boiler is tailored to burn wood with a humidity of up to 55%.

An integrated firing system with spreader-stokers and travelling grate technology guarantees the complete burnout of the wood, minimizing emissions while maintaining high combustion efficiency.

Further reduction of emissions is achieved by a bag filter removing dust and particles from the combustion gases before they are being released into the atmosphere.

The energy released from the combustion is used to convert water to superheated steam in the boiler.



Ground breaking ceremony, April 2006.

From left: Dr. Brian Gibbons, Welsh Assembly Minister Social Justice and Local Government; David Williams, ECO2; Peter Hain, Member of Parliament for Neath former Welsh Secretary of State; Geoff Jones, Chairman Western Log Group; and Dr Hwyl Francis, Member of Parliament for Aberavon.



A Mitsui-manufactured steam turbine converts the energy in the superheated steam to rotational energy, driving a generator. The steam turbine is equipped with two shafts to optimize efficiency.

An air-cooled condenser supplied by GEA is converting the steam back into water before returning it to the boiler.

The plant is further equipped with a control system developed by BWSC and AET. The purpose of the system is to meet the client's expectations by ensuring

- High energy production
- High efficiency
- Low emissions

while at the same time keeping operating costs low.



Summary

Contract

Type Turnkey
Effective contract June 2006

Technical Data

Boiler

Make Aalborg Energie Technik
Type AET-M-1050 Single drum, natural circulation
Grate type Travelling
Fuel feed Spreader stoker
Steam data 92 bara, 510°C

Turbine

Make Mitsui Engineering & Shipbuilding
..... under license of Alstom
Type Dual shaft geared
HP TM2 24,6
LP TM2 48,7
Gear Flender type TSD 95 C

Alternator

Make Brush
Type DG 165Z-04
Voltage/frequency 11KV/50Hz
Rated output 19294 KVA
Protection IP 54
Exciter Brushless type DGBP 60/15

Fuel Supply System

Make Vecoplan
Type Dual push floors and conveyor transport

Flue Gas Cleaning

Make Lühr
Type Baghouse with jetpulse cleaning

Condenser

Make GEA Energietechnik
Type Air Cooled Condenser
Pressure 0.16 bara

Step-up Transformer

Make Siemens Alkargo
Type TCA 1850/36
Cooling ONAN
Ratio 11/36 KV
Rated output 18500 KVA

Water Treatment Plant

Make Silhorko/Eurowater
Type Reverse osmosis with activated carbon
..... filter, deionization and mixed bed polisher

MV Switchgear

Make Siemens
Type NXAIR

Control System

Make Siemens
Type S7-400PLC

Project Implementation

With the Western Wood energy project, BWSC has demonstrated its capabilities in uncompromised quality.

BWSC has established state-of-the-art layout and design by involving a number of international suppliers from Denmark, Japan, Germany and the Netherlands.

All in all, a multinational site crew of 200 people, employed by BWSC and AET, has cooperated efficiently and successfully in delivering the plant within an effective construction period of 24 months.

Operation and Maintenance

To guarantee optimal efficiency and reliable operation and maintenance (O&M) 24 hours a day on an annual basis, BWSC and AET founded a special purpose company undertaking a 5-year full O&M contract, Western Biomass Operating Co. Ltd. (WBOC).

Throughout the contract, WBOC will ensure high reliability through proven technology, extensive operational experience and the fulfillment of all necessary maintenance and support tasks.



WBOC's O&M-staff in front of the Western Wood biomass plant.



Port Talbot, Wales



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