



38.5 MW Sleaford Biomass Power Plant under construction, Lincolnshire, the UK

April 2013



THE UK'S LARGEST STRAW-FIRED BIOMASS PLANT TO DATE

Sleaford Straw-fired Power Plant

PROJECT DESCRIPTION

The Sleaford Biomass Power Plant is a 38.5 MW straw-fired Combined Heat and Power (CHP) plant currently under construction in Sleaford, Lincolnshire, in the eastern part of England.

The straw-fired power plant is being constructed on a full turnkey basis by Burmeister & Wain Scandinavian Contractor A/S (BWSC), in a consortium with the boiler manufacturer Burmeister & Wain Energy A/S (BWE).

As consortium leader, BWSC is responsible for the coordination of all technical and commercial aspects of the project.

Following the construction phase, BWSC will further operate and maintain the biomass plant over a 12-year period.

The Sleaford Biomass Power Plant project is owned by Glennmont Partners, an investment fund specialising in renewable energy.

Eco2 Ltd (Eco2), a UK-based company specialised in the development, financing and operation of renewable energy projects, originally developed the Sleaford project and is overlooking the construction of the plant on behalf of Glennmont Partners.



Sleaford Biomass Plant under construction, April 2013

PROJECT BACKGROUND

Creating market possibilities for renewable power generation is an integral part of the UK Government's aim of reducing CO₂ emissions. Based on these market possibilities, Eco2 is developing a number of straw-fired power plants of which the Sleaford Biomass Power Plant is the first.

BWSC and Eco2 have a history of working closely together. The cooperation began in 2006 with the development and construction of a 14 MW power plant, the Western Wood Biomass Plant.

This plant, which is the first wood chip-fired power plant in Wales, was developed by Eco2 and constructed by BWSC in a consortium with the boiler supplier AET. Today, the Western Wood Biomass Plant is operated and maintained by a jointly owned BWSC-AET company.

The cooperation on the Western Wood Biomass Plant has been fundamental for the establishment of a strong relationship between BWSC and Eco2. This relationship further grew through the 5-year development phase for the Sleaford Biomass Power Plant project.

BWSC has more than 30 years of experience in providing Engineering, Procurement, Construction (EPC) turnkey power plant projects around the world, including Combined Heat and Power (CHP) plants and the successful completion of the Western Wood Biomass Plant. This has given BWSC the substantial expertise and know-how necessary for taking on the Sleaford Biomass Power Plant project.



Arrival of the generator, April 2013

PROJECT PROGRESS, APRIL 2013

Major works have been accomplished since the Sleaford contract became effective in December 2011.

The engineering activities, which are the basis for the procurement of machinery and for all production and site work, started immediately after the effective contract date in accordance with a detailed project plan to ensure timely execution of site works as well as delivery and erection of the numerous components.

Access to site was completed in April 2012, thereby enabling BWSC to commence the execution of the permanent works in May 2012.

BWSC is working according to tight, internal deadlines in order to hand over the Sleaford project to the client on or ahead of contractual schedule.

Since the start of the work on site in 2012, the activities and manning on site have increased until the peak period in the first part of 2013, where the manning on site included approximately 250 people.

As a result, most of the milestone activities have been completed ahead of the contractual schedule. Thus, the Sleaford Biomass Plant is expected to commence production in the early part of 2014.

The turbine was delivered in the second week of April

2013, and all major erection works are expected to be completed during the summer of 2013.

Subsequently, the Sleaford project will enter into a phase with focus on the completion of minor works. At the same time, testing activities will start up, leading into the commissioning phase.



OPERATION & MAINTENANCE



Upon completion of the construction, the Sleaford Biomass Power Plant will be operated and maintained by BWSC throughout a long-term Operation and Maintenance (O&M) contract.

TECHNICAL DESCRIPTION

The Sleaford Biomass Power Plant is a Combined Heat and Power (CHP) plant based on a steam/turbine cycle with relatively advanced parameters.

The plant burns straw in a BWE boiler to produce high pressure temperature steam at 540°C and 112 bar.

The steam is fed into the steam turbine generator in which the steam's energy is converted, firstly to mechanical energy, secondly into electric energy at a voltage of 11 kV.

The annual fuel consumption is approximately 240,000 tonnes consisting primarily of baled straw from local farmers.

As a safety measure, the Sleaford Biomass Plant further has an auxiliary fuel line with a sufficient capacity to substitute up to 20% of the straw with wood chips.

During a 12 year period, on a 24/7 basis, BWSC will ensure optimal plant performance and lifetime, based on BWSC's in-depth power plant expertise and extensive operational experience.

The O&M organisation will be made up of a local dedicated group with back-up from power plant specialists located at BWSC's head office in Denmark.

The on-site organisation will consist of approximately 20 locally employed staff members who will undergo extensive O&M courses and hands-on training, starting approximately half a year prior to taking over the Sleaford Biomass Power Plant.

The purpose of the training courses is to make the staff fully confident with the O&M procedures and routines of the entire power plant, including fire-fighting, health, safety and environmental issues.



BENEFITS FOR SOCIETY

The Sleaford Biomass Power Plant will have a strong contributing role in reducing CO₂ emissions in the UK as well as stimulating employment and economy in the Lincolnshire area.



Based on locally sourced renewable energy fuel, the power generated from the Sleaford Biomass Power Plant will be supplied to approximately 65,000 households and businesses.

Sleaford, April 2013



The process offsets the equivalent CO₂ levels which otherwise would have been released from burning fossil fuels to generate the same amount of electricity. Overall, this reduces the UK's carbon emissions by over 150,000 tonnes of CO₂ per annum.

District heating will be supplied free of charge to public buildings in Sleaford town centre, including the public swimming pool and council offices.



The construction and erection of the Sleaford Biomass Power Plant is currently providing wide job opportunities for local contractors, and approximately 20 people will be employed for the operation and maintenance.



Each year, the Sleaford Biomass Power Plant project will further inject around £ 10 million into the local economy from its fuel supply contracts.

BWSC – YOUR BIOMASS TURNKEY POWER PARTNER

BWSC is working on enhancing renewable energy solutions in the strive for a future where renewable and clean energy sources will be major contributing factors to continued sustainable growth and prosperity all over the world.

BWSC offers its extensive experience as a turnkey power plant developer, contractor and service provider of tailor-made, state-of-the-art biomass plants in sizes ranging from 15-60 MWe.

By cooperating with leading suppliers of biomass boilers, turbines and other equipment, BWSC is able to ensure the highest efficiency, reliability and availability in accordance with the specific needs of the client and comply with the most stringent pollutant emission limits.



Western Wood Biomass Plant, Wales, UK

Within the last three decades, BWSC has successfully been working on and provided turnkey solutions for over 170 projects in 52 countries, with a total generating capacity in excess of 3,400 MW.

Furthermore, BWSC has long-term technical support and Operation & Maintenance agreements covering plant capacities of above 700 MW.

Even in the most challenging environments, clients can rely on BWSC to deliver high-efficient and reliable power plants on time and on budget.



PARTIES INVOLVED

SUMMARY DATA

CONSTRUCTION PARTNERS



DEVELOPER



OWNER



LENDERS



Summary Data

Location: Sleaford, Lincolnshire, UK
Fuel 240,000 t/y of primarily baled straw
Thermal input Up to 120 MW
Electrical Output 38.5 MW
Net Electrical Efficiency 34.0%
Grate Type: Vibrating grate
Steam Conditions: 112 bar; 540°C
Condensing: Air cooled condensers
Particulate Control: Bag house filters
NO_x Control: SNCR / SCR



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