



Tees Renewable Energy Plant


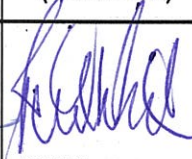
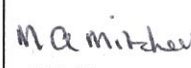
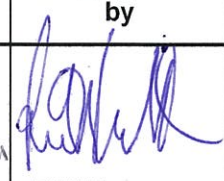
CHP ASSESSMENT

Prepared by



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LIST OF ABBREVIATIONS

CCGT	combined cycle gas turbine
CHP	combined heat and power
CHPA	Combined Heat and Power Association
CFB	Circulating Fluidized Bed
CO ₂	carbon dioxide
DBERR	Department for Business, Enterprise and Regulatory Reform
EU ETS	European Union Emissions Trading Scheme
GWe	gigawatt electrical
ha	hectares
HP	high pressure
km	kilometres
kV	kilovolt
Ltd	Limited
m	Metre
MGT	MGT Teesside Ltd
MW	Megawatt
MW/km ²	megawatt per square kilometre
MWh	megawatt hour
MWth	megawatt thermal
NHS	National Health Service
OGC	Office of Government Commerce
SABIC	Saudi Basic Industries Corporation
UK	United Kingdom

EXECUTIVE SUMMARY

This combined heat and power (CHP) feasibility assessment has been undertaken by PB Power on behalf of MGT Teesside Ltd (MGT) for the proposed new 300 MW Tees Renewable Energy Plant (REP), to be situated on land to the west of the main dock at Teesport. The site is located on 14 ha of land within the Teesport landholding approximately 5 km east of Middlesbrough and 6 km west of Redcar. The site falls within the jurisdiction of Redcar and Cleveland Borough Council in the Tees Valley.

This report has been prepared as part of a requirement by the UK Government for any proposals for new power projects to be accompanied by an assessment of the potential for CHP in the vicinity of a proposed site in accordance with the assessment methodology outlined in the Department of Trade and Industry (now Department for the Business, Enterprise and Regulatory Reform or “BERR”) guidance document “Guidance on background information to accompany Notifications under Section 14(1) of the Energy Act 1976 and Applications under Section 36 of the Electricity Act 1989 December 2006”.

At this stage in the development process, the Saudi Basic Industries Corporation (SABIC) chemical storage site to the west of the proposed development has been identified as a potential user of steam from the proposed Tees REP. While SABIC’s demand for steam is currently relatively small, MGT will continue to consult with SABIC as the development progresses in case their demands change.

Further users could also be identified or indeed forth coming in the event that the plant is consented and moves towards the detailed design stage. Given the size and nature of the proposed plant successful consenting may be required before a user may show a serious interest in the use of steam in the area.

1. INTRODUCTION

This combined heat and power (CHP) feasibility assessment has been undertaken by PB Power on behalf of MGT Teesside Ltd (MGT) for the proposed new 300 MW Tees Renewable Energy Plant (REP), to be situated on land to the west of the main dock at Teesport, Middlesbrough. The site is located on 14 ha of land within the Teesport landholding approximately 5 km east of Middlesbrough and 6 km west of Redcar. The site falls within the jurisdiction of Redcar and Cleveland Borough Council in Tees Valley.

The Tees REP development will comprise of a circulating fluidized bed (CFB) boiler. The hot combustion gas will flow vertically down through the boiler, raising steam which is subsequently passed to a 300 MW steam turbine to generate the electricity. MGT Teesside proposes to develop the Tees REP to meet electrical demands in the most flexible and environmentally friendly manner.

This report has been prepared as part of a requirement by the UK Government for any proposals for new power projects to be accompanied by an assessment of the potential for CHP in the vicinity of the proposed site.

1.1 UK Government Policy

As part of the National Energy Policy the UK Government is committed to promoting the installation of CHP wherever economic and has set a target to achieve at least 10 GWe of installed CHP capacity by 2010. To achieve this target Government policy has been formulated to support the provision of CHP generation wherever feasible.

The Government hopes that their CHP policy will help the government achieve its energy policy objectives of securing supply in a diverse and sustainable manner while allowing power to be generated at competitive prices. The greater efficiency associated with CHP installations will also assist the Government in achieving its obligations under the European Union Emissions Trading Scheme (EU ETS) and other targets and supporting legislation.

The Government acknowledges that opportunities to exploit CHP are not always technically practical and economically justifiable. However to promote the use of CHP technology it expects developers to submit information in support of notifications under Section 14(1) of the Energy Act 1976 and applications under Section 36 of the Electricity Act 1989, which demonstrates that they have seriously explored opportunities for CHP, including community heating, in developing their proposals. This assessment has been undertaken for the Tees REP.

The requirements of this assessment are outlined in the Department of Trade and Industry (now Department for the Business, Enterprise and Regulatory Reform or "BERR") guidance document "Guidance on background information to accompany Notifications under Section 14(1) of the Energy Act 1976 and Applications under Section 36 of the Electricity Act 1989 December 2006".

1.1.1 Guidance requirements

The guidance requires developers to explore opportunities to use CHP, including community heating, when developing proposals for new power stations. Any proposals submitted to the BERR are therefore expected to show that the developer has actively explored the opportunities for CHP use. Where heat opportunities have been identified as part of the studies undertaken, developers are required to show how they have dealt with these in shaping their proposals.

The guidance notes that future market conditions, outside the control of any project proponent, has the potential to give rise to variations to actual heat demand. Heat customers, identified during the development of project proposals, may take more or less heat than anticipated and new customers may emerge.

1.1.2 Potential markets

The BERR suggests a number of potential markets are identified as being worthy of consideration in CHP assessments undertaken by developers, either singly or in combination.

Industry, commerce and public services are all identified by the BERR as being prospective users of CHP with the largest, most economic opportunities expected to be found in the industrial sectors where there are often large requirements for process heat.

Opportunities however, are also identified in commerce (eg hotels, leisure centres, large corporate buildings) and public services (e.g. hospitals, universities, prisons, defence installations, administrative offices and ancillary college or hospital accommodation). There is also potential for CHP where heat can be used in absorption chilling to deliver cooling in industry, commerce and the public sector.

The guidance note suggests that developers contact Trade associations and other business organisations to explore CHP opportunities in the key business sectors identified above as having an interest in CHP. These include:

- Paper Federation;
- Energy Saving Trust and
- Combined Heat and Power Association (CHPA).

Other parties considered by the DBERR as being able to assist in CHP assessment include:

- Strategic Heath Authority;
- Climate and Energy: Household Markets
- The Carbon Trust
- the Prisons Department;

- Local Government Association;
- the Housing Corporation;
- The Government's 'CHP Club'; and
- Regional Development Agencies.

1.1.3 Proposal assessment

The Government recognises that decisions on major new power station investments, including the location and anticipated load duty of the station (eg base load, mid-merit, peak-opping, support to local industry, etc), will primarily be driven by the market, taking into account fiscal and other incentives now on offer for CHP. Whilst some projects are developed as CHP from the outset, it is recognised that it is not always feasible to identify and accommodate CHP at a proposed site.

To show that developers have properly considered the CHP options for a site however the BERR expect that developers include with their applications for Section 36 and Section 14;

- an explanation of the choice of location;
- a description of the exploration carried out with prospective local heat customers;
- the results of that exploration;
- a list of organisations contacted;
- a description of any existing local heat use;
- the basis for the developer's conclusion that it is not economically feasible to exploit existing local heat markets (if this is the case);
- a description of potential future heat requirements in the area; and
- the provisions in the proposal for exploiting potential heat demand in the future.

These points have been addressed and are discussed below.

2. CHP ASSESSMENT

PB Power on behalf of MGT has undertaken a CHP assessment to address the requirement of the BERR detailed above for the Tees REP. This assessment has included investigation of the existing situation in the Teesport area.

As part of this assessment PB Power has contacted the parties identified by the BERR (DTI) in the guidance document "Guidance on background information to accompany Notifications under Section 14(1) of the Energy Act 1976 and Applications under Section 36 of the Electricity Act 1989 December 2006".

2.1 The Site

The proposed Tees REP is located on 14 ha of land within the Teesport landholding approximately 5 km east of Middlesbrough and 6 km west of Redcar. The site falls within the jurisdiction of Redcar and Cleveland Borough Council in the county of Tees Valley.

The Teesport Estate, in which the Project site is situated, is an industrial area, and is one of the few natural deep water tidal facilities in the UK, and is the second largest port in the UK, in terms of tonnage. The port handles over 50 million tonnes of cargo a year. The area surrounding the site of the proposed development is a busy industrial area with associated heavy 24 hour traffic flows on the A66, A1053, A1085 and A174.

On the eastern side of the site there is an existing steel framed warehouse and Tees Dock quay. The works in the steel framed warehouse are now undertaken on the adjacent quay, making the building redundant. The warehouse will be dismantled and its land area leased to MGT. Cleveland Potash operates on the opposite side of Tees Dock (the eastern side) where they handle and store dry bulk products.

To the west of the proposed site is a tank farm owned by SABIC (previously Huntsman Chemical) which is used for the storage of various chemicals such as benzene, xylene, paraxylene and Butadiene. There are a series of pipelines associated with the tank farm that run around the perimeter of the site.

The reasons for site selection are discussed in depth in Section 4 of the Environmental Statement for the project and include:

- Its long distance from residential receptors;
- Proximity to deep water and available quay facilities for the planned reception of Panamax vessels containing 40,000 tonnes of wood chip fuel;
- Transport infrastructure that will readily accommodate construction traffic including roads and rail;
- Availability of sufficient land in an area zoned for industrial use;
- Ship unloading and fuel transfer facilities;
- Reduced visual impact due to the industrial nature of the area; and;
- Proximity of site to potential heat and power off-takers.

It is therefore considered the proposed site is suitable for the intended use of power generation.

Existing and potential industries in the Tees REP area were assessed for their use of significant quantities of steam/heat in their processes.

2.2 Consultees

In accordance with the DBERR's guidance on CHP assessment PB Power has contacted organisations identified by the DBERR as being able to assist in the identification of potential CHP users. Organizations contacted as part of the assessment included:

- The Carbon Trust;
- Energy Saving Trust;
- DEFRA CHP Team
- Department for Business, Enterprise and Regulatory Reform
- One NorthEast;
- Government Office for the North East of England;
- CHPQA;
- BASF Group;
- ConocoPhillips;
- Petroplus Oil Refinery; and
- SABIC North Tees Olefins.

The DBERR recommended that the CHP Club and Future Energy Solutions be contacted during the consultation. Both these organisations are now part of/affiliated with the Carbon Trust and were therefore contacted in this way.

2.3 Consultee responses

Of the consultees contacted, one replied by letter and one by telephone. However, just one of the consultees who replied can be considered a potential user of steam from the Tees REP, the SABIC chemical storage plant to the west of the proposed development.

Where replies were not forthcoming from the letters and emails sent out, these were followed up by telephone enquiries. In no cases was there any interest or information provided by the consultees contacted from these follow up enquires.

3. POTENTIAL USERS

The CHP assessment has identified one potential steam user in the Teesport area who might be able to take advantage of the construction of the Tees REP.

Following a meeting with representatives of SABIC at the Wilton Centre on 1 May 2008, there is some potential for SABIC to become a steam user. However, at this time their demand for steam is considered to be relatively low and therefore the possibility of a deal would need to be explored in more detail at a later date. An opportunity with SABIC at the North Shore development was also discussed as there could be greater demand. It is thought however that a steam pipe under the river is unlikely to be economical.

There could be potential to tie in with the industrial heat pipeline at SembCorp's 197 MW CHP plant at Wilton. MGT will pursue a meeting with SembCorp representatives to discuss this possibility further in the near future.

The CHP assessment has not identified any other potential user of steam from the proposed Tees REP to date. Consultation is ongoing between MGT Teesside and local industries in an attempt to identify such a user.

The installation of a community heating programme is not considered to be financially viable given the industrial setting of the proposed plant with the nearest residential area being 2.5 km from the site.

4. CONCLUSIONS

At this stage in the development process, only the SABIC chemical storage site has been identified as a potential user of steam from the proposed Tees REP. While SABIC's demand for steam is relatively small, MGT will continue to consult with SABIC as the development progresses in case their demands change.

Further users could also be identified or indeed forth coming in the event that the plant is consented and moves towards the detailed design stage. Given the size and nature of the proposed plant successful consenting may be required before a user may show a serious interest in the use of heat in the area.

**A. SAMPLE LETTER
(1 page)**

2 April 2008

Our ref:

Electricity Development Consents Team
Department for Business, Enterprise and Regulatory Reform
1 Victoria Street
London
SW1H 0ET

Dear Sir

MGT Power – Biomass Power Station, Teesport

PB Power are acting on behalf of MGT Power in the development of Biomass Plant within a disused area of Teesport, North East England. The Plant will generate around 300 MW of renewable electricity from approximately 2.5 million tonnes of biomass (clean wood chip fuel) per year. A Section 36 application is currently being prepared for submission to the Department for Business, Enterprise and Regulatory Reform (BERR).

Under BERR guidance on background information to accompany applications under Section 36 of the Electricity Act 1989 and notifications under Section 14(1) of the Energy Act 1976 (URN 01/693, March 2001), developers of power stations are now required to explore opportunities to use CHP when developing the proposals. The BERR also included a list of organisations, which could help with the exploration of potential heat users in the vicinity of proposed power stations. Your organisation has been identified by the BERR as one such contact.

We enclose a location map for the proposed project that is located at Ordnance Survey grid reference NZ543232.

We would be grateful if you could advise us of the heat users within 3 km of the proposed site including where possible their peak heat demand, heat demand per annum and the conditions of the heat required. This will allow us to assess the potential for economically viable heat users in the vicinity of the proposed power station. If this advice could be provided within 21 days of receipt of this letter we would be most grateful. Should you wish to receive a copy of the Scoping Study for the proposed project or require any further information please do not hesitate to contact me on the above number.

Yours faithfully
PB Power

Mark Wilson
Environmental Engineer

Enc

**B. RESPONSES RECEIVED
(1 page)**



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9th April 2008

Dear Mr Wilson,

MGT Power – Biomass Power Station, Teesport.

In response to your request for help with the exploration of potential heat users in the vicinity of MGT Power's proposed Biomass Power Station at Teesport, I can direct you to the Industrial Heat Map that we developed for the Defra and BERR. This can be found at:

<http://www.industrialheatmap.com/>

Yours sincerely,

CHPQA Administrator