The Millbrook Power (Gas Fired Power Station) Order

6.2 Environmental Statement Appendices – Volume F Appendix 5.1 CHP Statement

Planning Act 2008
The Infrastructure Planning
(Applications: Prescribed Forms and Procedure) Regulations 2009

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CHP Statement

DESIGN NOTE ON COMBINED HEAT AND POWER

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WSP | PARSONS BRINCKERHOFF

MILLBROOK POWER PLANT

DESIGN NOTE ON COMBINED HEAT AND POWER

Millbrook Power Ltd.

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ABBREVIATIONS

ABBREVIATION	DESCRIPTION
CCGT	Combined Cycle Gas Turbine
CHP	Combined Heat and Power
CHP – R	CHP Ready Guidance for Combustion and Energy from Waste Plants
CM	Capacity Mechanism
DCO	Development Consent Order
DECC	Department for Energy and Climate Change
EA	Environment Agency
GT	Gas Turbine
GTG	Gas Turbine Generator
Ha	Hectare
HCA	Homes and Communities Agency
km	Kilometres
kV	Kilovolt
LCA	Landscape Character Assessment
LCPD	Large Combustion Plant Directive
LEPs	Local Enterprise Partnerships
MWe	Mega Watt Electrical
NSIP	Nationally Significant Infrastructure Project
MPL	Millbrook Power Limited
RGE	Reciprocating Gas Engine
OCGT	Open Cycle Gas Turbine

GLOSSARY OF KEY TERMS

TERM	ABBREVIATION	DESCRIPTION
Peaking plant	n/a	Used to generate electricity for peak load electrical demand or shortfalls of electricity supply. For this project Peaking plants are defined as those that may operate up to 1,500 hours per annum.
The Project	n/a	The Millbrook Power Project, comprising the following principal elements: 1) A new Power Generation Plant 2) A new Electrical Connection; and 3) A new Gas Connection. The Power Generation Plant, Gas Connection and Electrical Connection are referred to as the Project.
Project Site	n/a	This includes the Power Generation Plant Site, Electrical Connection Site, Gas Connection Site and construction access/laydown and future maintenance access/laydown areas. The Project Site corresponds to the limits of the draft Development Consent Order (the Order Limits).
Generating Equipment	n/a	Gas Turbine Generator and Balance of Plant which are located on the Generating Equipment Site.
Power Generation Plant Site	n/a	One of the three principal Project Site areas. The area within which the Power Generation Plant development will occur.
Nationally Significant Infrastructure Project	n/a	The Project constitutes a Nationally Significant Infrastructure Project (NSIP) by virtue of s.14(1)(a) and s.15 of the Planning Act 2008 (PA 2008) which include within the definition of a NSIP any onshore generating station in England or Wales of 50 MWe capacity or more.
The proposed DCO Application	n/a	The application made under s.37 of the Planning Act 2008 to the Secretary of State (SoS) to seek consent for the Project, as required under s.31 of the Planning Act 2008.
APFP Regulations	n/a	The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, as amended, which prescribe various matters in connection with the making of an application for development consent under the Planning Act 2008.
Three phases of the entire lifecycle of the Project	n/a	There are three phases – Construction, Operation, and Decommissioning. - Construction of the Project will take approximately 22 months depending on the final choice of plant selected. - Upon Commissioning, the Power Generation Plant will be operating on a commercial basis ('Operation'). It is designed to have an operational life of up to 25 years, after which it could be decommissioned or re-powered depending on factors such as the nature of the electricity market and energy mix at the time. - Decommissioning would comprise of the removal of all Power Generation Plant items and restoration of the Power Generation Plant Site. It is likely that some underground structures (e.g. gas and electrical connections) would be left in situ to avoid any adverse environmental impacts.
Stack	n/a	The structure by which the exhaust gases and waste heat are emitted to the atmosphere. Typically, the GTG unit would have

		its own dedicated stack. Its height would be between 30 m-35 m and would contain a silencer to reduce noise emissions. The exhaust gases would be subject to emissions control abatement.
Demineralised Process Water Tank	n/a	Required to store process water which will be used as make up for the GTG. High purity (demineralised) process water will be delivered by tanker to the Power Generation Plant Site and stored in a single Demineralised Process Water Tank.
Fire Water Tank	n/a	Designed to comply with the relevant fire regulations and installed together with fire pumps, hose reels, fire hydrants and portable extinguishers.
A Control Building	n/a	Required in order to monitor the plant operation and house plant controls. Within the Power Generation Plant site.
A Workshop and a Store	n/a	To store certain strategic and routine maintenance spares and to provide a facility for carrying out minor maintenance of the plant.
Security Infrastructure	n/a	Infrastructure designed to maintain a secure and safe environment within the Project Site.
Lighting infrastructure, roadways and parking	n/a	Suitable lighting for safety, security and maintenance access, along with access, turning, loading and parking areas for workers' vehicles and operational vehicles.
Administration building and Office	n/a	Housing administration and welfare functions and related personnel. Situated within the Power Generation Plant Site.
Telemetry apparatus	n/a	For the remote control of equipment, measurement or collection of data.
A Switchyard	n/a	Containing one transformer and other plant required to manage the transmission of electricity: These transform the alternating current generated by the GTG into a higher output voltage to enable export to the National Grid. Situated within the Power Generation Plant Site.
A Natural Gas Receiving Station and Compound	n/a	Situated within the Power Generation Plant Site. This contains a PIG receiving facility, isolation valve and control and instrumentation kiosk. Its role is to receive the imported gas from the NTS, before it is fed to the GTG under the right flow and pressure conditions.
Combined Cycle Gas Turbine	CCGT	Gas plant technology system comprising Gas Turbine(s) fuelled by natural gas, a Heat Recovery Steam Generator(s) utilising heat from the Gas Turbine exhaust gases, and a steam turbine plant with associated condensing system.
Combined Heat and Power	CHP	A cogeneration power station capable of supplying power to the National Grid and also heat to local heat users (such as industry or leisure) through a direct connection to waste heat / steam produced as part of the combustion process.
CHP Ready Guidance for Combustion and Energy from Waste Plants	CHP -R	The Environment Agency (EA) has published its CHP-Ready Guidance, which applies to applications for Environmental Permits for new plants under the Environmental Permitting (England and Wales) Regulations 2010 for: New combustion power plants (referred to as power plants) with a gross rated thermal input of 50 MW or more; and, New Energy from Waste plants with a throughput of more than 3 tonnes per hour of non-hazardous waste or 10 tonnes per day of hazardous waste.
Capacity Mechanism	CM	Changes to the electricity market mean that there are risks to the future security of electricity supplies. Government will therefore legislate to introduce a Capacity Market. The Capacity Market will provide an insurance policy against the possibility of future blackouts by providing financial incentives to ensure we have enough reliable electricity capacity to meet demand.
Development Consent Order	DCO	Consent by a UK Government Minister for a Nationally Significant Infrastructure Project. A DCO can incorporate or override the need for a variety of consents which would

		otherwise be required for a development, including planning permission. A DCO can also include rights of compulsory acquisition. A DCO is made in the form of a Statutory Instrument.
Department for Energy and Climate Change	DECC	UK Government department responsible for policy and maintaining international and industry relations to support a continuous UK energy supply, reduce greenhouse emissions and adapt to climate change.
Environment Agency	EA	Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs.
Gas Turbine	GT	A type of internal combustion engine comprising compressor, combustion chamber and turbine. Air is drawn into the compressor section and compressed. Natural gas is mixed with the compressed air in a combustion chamber where it is ignited. The high pressure, high temperature air then enters the turbine where it expands back to atmospheric pressure air and turns the turbine to create electricity.
Gas Turbine Generator	GTG	A GTG comprises a Gas Turbine and Generator and associated auxiliaries such as air inlet filter, coolers, equipment skids and control panels. The GTG may be an 'industrial' type unit which are suited to long operational hours and are more efficient but less flexible than smaller class units. To achieve up to 299 MWe, MPL would propose to use 1 individual industrial GTG.
Hectare	Ha	A unit of area (10,000 m^2 / 2.471 acres)
Homes and Communities Agency	HCA	The Homes and Communities Agency is the national housing and regeneration agency for England, with a capital investment budget of around £4bn for the period 2012-15. We contribute to economic growth by helping communities to realise their aspirations for prosperity and to deliver high-quality housing that people can afford.
Kilometres	km	Measurement of distance (1000 metres).
Local Enterprise Partnerships	LEPs	Local enterprise partnerships are partnerships between local authorities and businesses. They decide what the priorities should be for investment in roads, buildings and facilities in the area.
Mega Watt Electrical	MWe	Measurement of electrical power.
Nationally Significant Infrastructure Project	NSIP	The Project constitutes a Nationally Significant Infrastructure Project (NSIP) by virtue of s.14(1)(a) and s.15 of the Planning Act 2008 (PA 2008) which include within the definition of a NSIP any onshore generating station in England or Wales of 50 MWe capacity or more.
Millbrook Power Limited	MPL	A special purpose vehicle which has been set up to develop the proposed Project and has been established by Drax Group plc. Drax is planning to develop flexible gas fired generation assets to support the UK Government drive to a low carbon economy. Drax has its project dedicated personnel sourced through an experienced management company, Stag Energy, founded in 2002.
Reciprocating Gas Engine	RGE	An engine that employs the expansion of hot gases to push a piston within a cylinder, converting the linear movement of the piston into the rotating movement of a crankshaft to generate power.
Open Cycle Gas Turbine	OCGT	Gas plant technology system comprising Gas Turbine(s) fuelled by natural gas. The hot exhaust gases are routed directly to the stack without passing through a secondary steam turbine. The generating technology used for the Power Generation Plant

1 INTRODUCTION

1.1.1 Combined Heat and Power (CHP) is the simultaneous generation of electrical power and usable heat in a single process, and is also known as co-generation. A CHP station may either supply steam direct to customers or capture heat from low-pressure steam after it has been used to drive electricity generating turbines, for hot water or space heating purposes. The heat can also be used to drive absorption chillers, thereby providing cooling.

1.1.2 CHP is considered advantageous as generating electrical power and heat together is more efficient than generating them separately. Therefore it can deliver a reduction in both primary energy usage and carbon emissions.

2 PROJECT DESCRIPTION

2.1.1 Millbrook Power Limited (MPL) is promoting a new gas fired peaking power generation plant on land that is partially located within 'The Rookery'. The Rookery comprises two former clay pits (Rookery North and Rookery South, covering an area of some 210 ha and separated by an east-west spine of unexcavated clay. The Rookery is situated in the Marston Vale between Milton Keynes and Bedford. It lies predominantly within the administrative area of Central Bedfordshire Council (CBC) although it also falls, in part, within the administrative area of the adjacent Bedford Borough Council (BBC). The power generation plant will be designed to provide an electrical output of up to 299 megawatts (MWe) and will be fuelled by natural gas.

2.1.2 The power generation plant will use one open cycle gas turbine generator (OCGT). The main generating equipment comprises a singular gas turbine generator (GTG). The GTG consists of an inlet air filter, an air compressor, combustion chamber, power turbine, exhaust silencer and generator.

2.1.3 Air is compressed in the compressor of the Gas Turbine (GT) and gaseous fuel is injected into the combustion chamber where the fuel burns producing hot, high-pressure gases. These gases expand across the turbine blades of the GT, which drives both the compressor and the electrical generator. The hot exhaust gases are then routed via a silencer to the stack and emitted to the atmosphere.

2.1.4 It is important to note that for the proposed, open cycle operation of the gas turbine, no steam will be produced as part of the electricity generation process.

2.1.5 The plant will be a 'Peaking Plant' operating for up to 1500 hours per year, its function being to support the national electricity transmission system by providing additional temporary generation at times of peak demand or to compliment the intermittent nature of renewable energy sources.

3 PURPOSE OF THIS DESIGN NOTE ON CHP

3.1.1 As OCGT technology has been selected for the Project, this Design Note on CHP summarises why further investigation into use of waste heat is **not** being undertaken, and provides evidence as to why the proposed thermal generating station **should be excluded** from being CHP-Ready.

4 REQUIREMENT FOR CONSIDERATION OF CHP IN APPLICATIONS FOR DEVELOPMENT CONSENT ORDERS

4.1.1 In accordance with the Planning Act 2008 (as amended by the Localism Act 2011), the Secretary of State is required to determine an application for an order granting development consent (DCO) for an energy Nationally Significant Infrastructure Project (NSIP) in accordance with the '*Overarching National Policy Statement for Energy (EN-1*)' (2011, DECC) and the relevant technology-specific national policy statement ('*National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)*' in the case of this Project).

4.1.2 The requirement or otherwise for the consideration and/or implementation of CHP, is detailed within Section 4.6 'Consideration of Combined Heat and Power (CHP)' of EN-1.

4.1.3 EN-1 states (at paragraph 4.6.6) that "*under Guidelines issued by DECC (then DTI) in 2006* [the Combined Heat and Power (CHP) Guidance[1]]*, any application to develop a thermal generating station under Section 36 of the Electricity Act 1989* ***must either include CHP or contain evidence that the possibilities for CHP have been fully explored*** *to inform the* [Secretary of State]*'s consideration of the application,*" and that the, *"...same principle applies to* [DCO applications] *under the Planning Act 2008*."

4.1.4 EN-1 continues: "*The* [Secretary of State] *should have regard to DECC's Guidance, or any successor to it, when considering the CHP aspects of applications for thermal generating stations.*"

4.1.5 The CHP Guidance (at paragraph 24) acknowledges, "*...that decisions on major new power station investments, including the location and anticipated load duty of the station (e.g. base load, mid-merit, peak-lopping, support to local industry, etc.), will primarily be driven by the market...*"

[1] *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.*

4.1.6 Paragraph 4.6.7 of EN-1 requires that developers, "...***consider the opportunities for CHP from the very earliest point and it should be adopted as a criterion when considering locations for a project***." The value of early consultation is also emphasised, in respect of the process of identification of potential heat users (customers), with bodies such as: the Homes and Communities Agency (HCA); Local Enterprise Partnerships (LEPs); and, Local Authorities.

4.1.7 In addition, as part of the examination process for the DCO application, the Environment Agency (EA) will be consulted on the details of the Project and the content of the application, including the developer's consideration of CHP.

4.1.8 Since publication of the CHP Guidance, the Environment Agency (EA) has published its own '*CHP Ready Guidance for Combustion and Energy from Waste Plants*' (2013) (CHP-R Guidance). This guidance states (in Section 3.3) that: "*When consulted by* [the Planning Inspectorate] ... *will highlight the need for the plant to be CHP or CHP-R and will make reference to* [the CHP-R Guidance]."

4.1.9 However, the CHP-R Guidance also develops further the considerations of paragraph 24 of the CHP Guidance in that, "*...it is recognised that in some cases (such as peaking plant...) the provision of CHP would not be compatible with the original operating regimes / intentions*."

4.1.10 Insert 1 of the CHP-R Guidance illustrates the recommended assessment process for CHP and CHP-R and how this guidance should be used. Step 1 of this process is to determine whether the new plant is required to be CHP or CHP-R. Where this is not the case, the developer is required to demonstrate that the provision of CHP is not compatible with the proposed operating regime / intention.

4.1.11 EN-1 (at paragraph 4.6.8) states: "*If the proposal is for thermal generation without CHP, the applicant should:*

- → Explain why CHP is not economically or practically feasible for example if there is a more efficient means of satisfying a nearby domestic heat demand;
- → Provide details of any potential future heat requirements in the area that the station could meet; and
- → Detail the provisions in the proposed scheme for ensuring any potential heat demand in the future can be exploited.

4.1.12 The requirements for the provision of information identified in the above policies and guidance are addressed in the remainder of this document

5 COMPATIBILITY WITH PROVISION OF CHP

5.1 FEASIBILITY

ECONOMIC FEASIBILITY

5.1.1 A primary requirement of a viable and effective CHP scheme is that it should be able to service the heat demand of any user connected to (and reliant on) the scheme.

5.1.2 The application of the CHP concept to a OCGT peaking power station is not economically feasible because the profile for the generation of electrical energy from the station cannot be guaranteed to coincide with the required heat demand profile of any potential consumer.

5.1.3 Because of its role in supporting the national electricity transmission system at times of peak or unexpected demand (including forced outages of other thermal generating stations), and in complementing the intermittent nature of renewable energy sources, the load regime for the OCGT station will be inherently unpredictable. Periods of electricity generation from the Project will typically be for 1-2 hours on occasional days, and of limited duration over the year. Given the proposed peaking role for the station, operation will be for no more than 1500 hours per year out of a potential 8760 hours in a year.

5.1.4 Heat demands, where they exist in the locality, are, by contrast, generally steady and persist over some 7 months of the year for residential heating or for the full year for industrial or commercial uses.

5.1.5 Any agreement drawn up between MPL and local customers for the supply of heat from the Power Generation Plant would normally guarantee that heat would be available for certain periods of the year and in sufficient quantities to satisfy the agreed demand. This agreement would also normally include financial penalties if heat was not able to be supplied when contractually obliged to do so.

5.1.6 Therefore, the disconnect between the relatively constant demands for heat from residential and industrial users and the inherently unpredictable supply from a peaking station such as this means that the CHP model is not applicable in this situation.

TECHNICAL FEASIBILITY

5.1.7 Conventionally, gas fired CHP plants configured as a CCGT usually provide heating via the provision of steam extracted from the existing steam cycle. As discussed previously, OCGTs do not produce steam as part of the electricity generating process and therefore the provision of CHP capability would require the addition of steam raising plant. The provision of CHP capability to a plant of this type would mean a significant increase in capital expenditure and additional technical challenges.

5.1.8 Compared to CCGT plant, OCGT units typically have a smaller capital cost per MW installed. This is largely because CCGT plants are more complex in their operation, requiring much more plant and equipment (e.g. a heat recovery steam generator (HRSG) and other steam raising plant) to operate. Although this increased capital cost is offset by gains in efficiency, CCGT plants are also typically designed to operate at continuous load, with fewer shut-downs and start-ups.

5.1.9 CCGT plants typically have efficiencies of around 55-60% (compared with 35-40% for OCGT), maximum gains in efficiency, however, are only realised when the plant has reached its operating temperature and is running continuously at full load.

5.1.10 The Power Generation Plant will be a peaking plant which would operate for up to 1500 hours per year. Most likely, this would be for short periods of time (typically 1-2 hours). Given that it can take up to 1 hour for a CCGT plant to reach full load, MPL considers that the benefits in efficiencies which can be achieved by using a CCGT plant are minimal and do not justify the additional capital costs of these plants, especially when considering the very short operating windows of the proposed OCGTs.

5.1.11 As OCGT plants are less complex in operation than CCGT or Reciprocating Gas Engine plant, they are also cheaper to construct, operate and maintain.

5.1.12 A further reduction in both cost and visual impact is realised when using a OCGT plant without steam raising plant. In a CCGT plant, the hot exhaust gases are routed through a HRSG, where they generate steam, which then drives a steam turbine. The extraction of energy from the hot exhaust gases to generate steam, means that they leave the HRSG stack at approximately 100°C

5.1.13 In comparison, the hot exhaust gases in a OCGT plant are discharged direct to the atmosphere at approximately 400°C-600°C. This means that the flue gases discharged from a OCGT plant are significantly hotter than those discharged from a CCGT plant, and therefore the gases are much more buoyant. Therefore a much lower stack is required for a OCGT plant to achieve the same dispersion height and rate of its exhaust gases as a CCGT plant.

5.1.14 Maintaining a low capital cost for the Project is essential as the Project will bid into the Government's newly proposed Capacity Mechanism (CM). Plants selected to operate within the CM are chosen based on their ability to deliver reliable power at times of peak demand at the most economically advantageous price.

5.1.15 Therefore, significantly increasing capital expenditure on the Project severely limits the ability to successfully bid into the CM. If a higher bid price was successful, then these increased costs would be directly passed to the consumer.

5.1.16 The use of OCGT technology is preferable at the Generating Equipment Site as water requirements are significantly less than a CCGT, and could be met with the occasional delivery of water by tanker.

5.1.17 Based on the technical discussion above, it is considered that the proposed Project, comprising OCGTs, is not suitable to act as CHP plant or need to comply with the requirements of CHP-R.

5.2 MEETING FUTURE HEAT REQUIREMENTS

5.2.1 Industry, commerce and public services are all identified 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.

5.2.2 Opportunities however, are also identified in commerce (e.g. 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 sometimes the potential for CHP where heat can be used in absorption chilling to deliver cooling in industry, commerce and the public sector.

5.2.3 Efficient CHP plants are usually designed to meet the demands of an identified heat load. Electrical power generation is utilised, where applicable for local process plant, and the balance exported to the grid. As noted previously, the Power Generation Plant could only service an intermittent heat source.

5.2.4 If a satisfactory steady heat load exists, the potential benefits of CHP schemes can be realised with electricity being generated in direct proportion to the heat load. The size of a CHP scheme, however, is determined by the local heat load which can be supplied at a common point.

5.2.5 For this reason the majority of CHP schemes are small (less than 5 MWe). These small units can offer high fuel utilisation when fully supplying the heat load. However during periods when the heat load is low or absent, the electrical efficiency of these units is rather low compared to conventional power stations.

5.2.6 In addition, due to the high cost of transporting heat in insulated pipes, experience indicates that it is unusual for a CHP scheme to be viable if the heat consumers are spaced apart and/or located far from the heat source. Normally the heat users would need to be within 1 to 2 km of the heat source.

5.3 PROVISIONS FOR ENSURING FUTURE HEAT DEMAND CAN BE EXPLOITED

5.3.1 Because of the unpredictable operating regime required of a peaking power station to flexibly support national grid demand, the viability of supplying occasional heat to future consumers in the area is negligible.

5.3.2 Moreover, the inclusion of provisions to ensure that future heat demand can be exploited in the equipment proposed for Power Generation Plant would increase capital expenditure of the Project further.

5.3.3 Such provisions could include space in the plant layout to install steam raising plant after the GT exhaust, however, this is not possible due to the constrained nature of the site. Such future space provisions would require further land to be purchased from the landowner.

5.3.4 Expansion of the site to the south is not possible because of the walls of the Rookery South Pit.

6 POSSIBILITIES FOR CHP

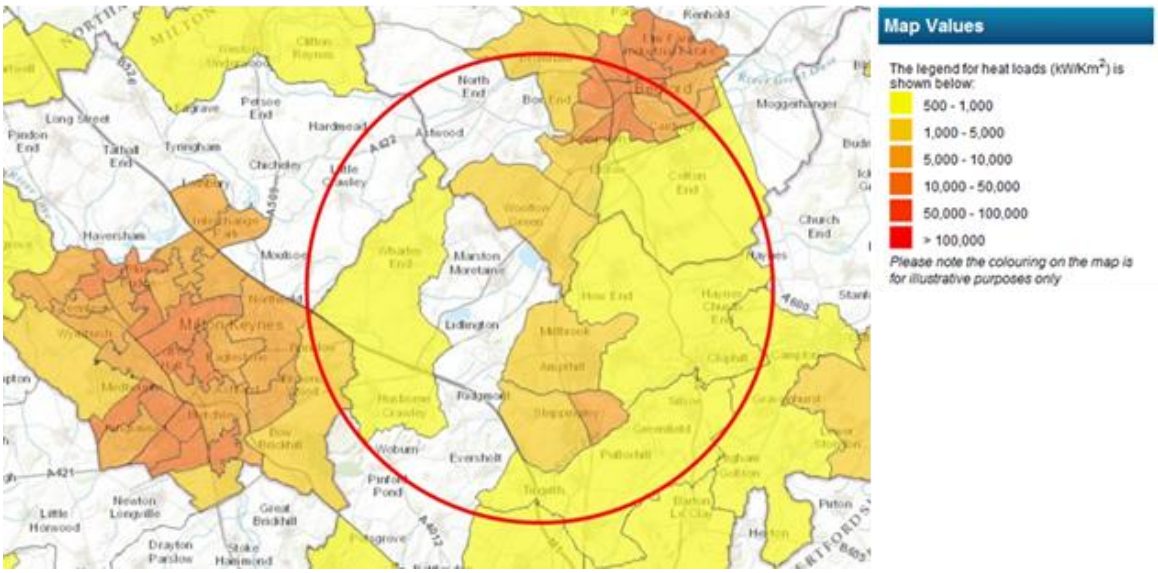
6.1 INITIAL CHP INVESTIGATION

6.1.1 As per Chapter 5 of the Environmental Statement, a detailed feasibility assessment was undertaken which considered a range of sites around England and Wales to support gas fired power generation plants.

6.1.2 To understand the likely heat demands in the area local to the identified Project Site, an assessment of the DECC online heat map[2] was carried out.

6.1.3 Figure 1 and Figure 2 below show the results of the assessment of DECCs Online Heat Map tool. The EA guidance suggests that for all plants less than 300 MW a search area of 10 km is used. No individual large industrial heat loads were identified within this area.

Figure 1 Approximate total heat load within a 10 km radius around the Project site



[2] http://chptools.decc.gov.uk/developmentmap/

6.1.4 Figure 2 shows the potential heat loads within the 10 km search area. It shows that the largest potential heat users are domestic with an approximate requirement of 491 MW. The second largest potential heat users are 'Warehouses' with an approximate requirement of 22 MW; the third largest potential heat users are 'Small Industrial' with an approximate requirement of 19 MW. Remaining heat requirements of other potential users in the area range from less than 1 MW to approximately 13 MW.

Figure 2 Total heat loads within the CHP search area

Sector Name	Share	Total KW
Communications and Transport	0.15%	898 KW
Commerical Offices	1.86%	11,309 KW
Domestic	80.87%	491,457 KW
Education	2.11%	12,811 KW
Government Buildings	1.61%	9,785 KW
Hotels	1.72%	10,452 KW
Health	0.53%	3,205 KW
Other	1.53%	9,272 KW
Small Industrial	3.05%	18,506 KW
Prisons	0.08%	502 KW
Retail	2.14%	13,000 KW
Sport and Leisure	0.81%	4,915 KW
Warehouses	3.56%	21,616 KW
Total heat load in Area		**607,726 KW**

6.1.5 Although there appears to be a large heat load in the area for domestic heat users, this is unlikely to represent a viable CHP opportunity based on, principally, the discussions presented earlier in this document under 'Feasibility' regarding intermittent loads from peaking plant and distance from the site. In addition to these discussions, however, the comparatively low density and age of housing in the region would make installing a new district heating network technically challenging and thus have associated cost implications.

6.1.6 The results of studies undertaken by MPL, which were informed by the changes as a result of the Electricity Market Reform and the Government consultations on the delivery mechanisms provided by the Energy Act 2013, have formed the basis for the selection of the peaking plant concept for the Project.

6.1.7 The Project is being developed to provide vital support to the national electricity transmission system as electricity demand increases and the nature of supply of electricity changes to incorporate a likely greater share of renewables in the generation mix.

6.1.8 Therefore, whilst consideration of the potential for the provision of CHP was considered as part of the site selection studies, the intentions for the Project meant that the provision of CHP was not the principal factor in the site selection process. It is, however, considered that this is in accordance with paragraph 2.2.1 of NPS EN-2 which states: *"it is for energy companies to decide which applications to bring forward and the government does not seek to direct applicants to particular sites for fossil fuel generating stations."*

7 CONCLUSIONS

7.1.1 Based on the information above, it can be concluded that there are three prohibitive barriers to the application of CHP for the Project:

- There is no existing regional heat market. From local searches, there are no suitable heat users of applicable scale available and no heat users able to accept the unpredictable supply of heat available.
- No potential future heat requirements in the area have been identified and none that would match the operational pattern of a Peaking power station.
- The intermittent and peaking modes of operation of OCGT are incompatible with the likely continuous demands of heat users. Because of the lack of applicable heat demands, provisions in the proposed scheme for exploiting any potential heat demand in the future can be excluded.

7.1.2 Accordingly, this Design Note on CHP demonstrates that the Project does not need to undertake further investigation of CHP for the proposed thermal generating station, and provides evidence as to why the proposed thermal generating station should be excluded from being CHP- Ready.