

**APPENDIX E:**  
**SUPPORTING COMBINED HEAT AND POWER (CHP) ASSESSMENT /**  
**INFORMATION**



## **SUPPORTING CHP ASSESSMENT / INFORMATION**

### **E.1 Introduction**

- E.1.1 This Appendix provides the supporting combined heat and power (CHP) assessment and information to fulfil the relevant CHP requirements.
- E.1.2 CHP, also known as cogeneration, is the generation of electrical power and usable heat in a single process. CHP is a well proven process for reducing primary energy consumption and total carbon dioxide (CO<sub>2</sub>) emissions that would result from the generation of electrical power and usable heat in separate processes. Indeed, a 2020 Consultation<sup>1</sup> issued by BEIS, states (at page 4) that by generating electrical power and heat simultaneously: *“CHP can reduce carbon emissions by up to 30% compared to the separate generation of heat through a gas-fired boiler and an electricity power station”*.
- E.1.3 In recognition of the role that CHP can play in meeting the UK’s climate change and energy policy priorities, the UK Government has continually stated that it is committed to the development and installation of CHP schemes. Indeed, in support of the legally binding 2050 ‘Net Zero’ Target<sup>2</sup>, the 2020 Consultation states (at page 4) it is: *“seeking views on:*
- *the current benefits from Combined Heat and Power (CHP);*
  - *the future role of CHP generation in achieving net zero greenhouse gas emissions by 2050, and supporting green recovery; and,*
  - *how the technology might support the decarbonisation of heat and industry”*.
- E.1.4 Furthermore, the 2020 Consultation states (at page 7) that: *“CHP has been identified as an important technology for achieving [the] Government’s targets”*.
- E.1.5 Therefore, wherever possible, the UK Government is committed to the development and installation of CHP schemes which qualify as ‘Good Quality’ CHP schemes under the CHP Quality Assurance (CHPQA) programme and, similar to ‘high-efficiency cogeneration’ schemes under the Energy Efficiency Directive<sup>3</sup>, are able to achieve 10 per cent primary energy savings compared with the separate production of electrical power and heat.
- E.1.6 Table E.1 provides a summary of the recent development of UK ‘Good Quality’ CHP schemes<sup>4</sup>.

**TABLE E.1: SUMMARY OF THE RECENT DEVELOPMENT OF UK ‘GOOD QUALITY’ CHP SCHEMES**

		<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Number of CHP Schemes		2,130	2,224	2,406	2,497	2,547
Electrical Power Capacity	MWe	5,708	5,625	5,919	6,063	6,050
Heat Capacity	MWth	20,091	19,785	20,586	20,934	20,690
Electrical Power Generation	GWh	19,534	20,406	21,771	22,945	23,461
Heat Generation	GWh	40,234	40,671	42,500	42,836	41,697
CO <sub>2</sub> Savings (all Fossil Fuels)	MtCO <sub>2</sub>	-	-	10.27	10.42	10.47
CO <sub>2</sub> Savings (all Fuels)	MtCO <sub>2</sub>	-	-	4.69	4.42	4.33

<sup>1</sup> ‘Combined Heat and Power: The Route to 2050 – Call for Evidence’ (BEIS, June 2020). Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/891722/chp-route-to-2050-call-for-evidence.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/891722/chp-route-to-2050-call-for-evidence.pdf)

<sup>2</sup> The 2050 ‘Net Zero’ target, set via the 2019 amendment to the 2008 Climate Change Act, requires a 100% reduction of all greenhouse gas emissions compared with 1990 levels. The original 2008 Climate Change Act required an 80% reduction of all greenhouse gas emissions compared with 1990 levels. Amended 2008 Climate Change Act available at: <https://www.legislation.gov.uk/ukpga/2008/27/contents>

<sup>3</sup> Directive 2012/27/EU on energy efficiency. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0027&from=EN>

<sup>4</sup> Adapted from Chapter 7 (Combined Heat and Power) of the Digest of UK Energy Statistics (DUKES) (July 2020). Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/905060/DUKES\\_2020\\_MAS\\_TER.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/905060/DUKES_2020_MAS_TER.pdf)

E.1.7 Based on Table E.1, it is noted that, in 2019, 'Good Quality' CHP capacity was estimated to be 6,050 MWe and 20,690 MWth. This capacity generated 23,461 GWh of 'Good Quality' electricity and 41,697 GWh of 'Good Quality' heat. On this basis, the 2020 Consultation states that: *"while it is difficult to estimate what proportion of the UK's heat demand this serves, due to the different temperature grades of heat required by different users and the different fuels and particular CHP technologies used, it is clear that CHP makes a significant contribution to this demand. CHP is used significantly by, chemicals, food and drink, paper and refining industries. Large numbers of buildings with high heat demands also employ CHP, with hospitals, hotels and leisure centres the biggest users"*.

## **E.2 Context**

### ***The Variation Application, and Relevant CHP Requirements***

- E.2.1 As noted in the main Environmental and Technical Schedule, the Proposed Development relates to the way in which SEP is authorised to operate. In particular, as enabled by the AGP upgrade to SEP, the Proposed Development comprises the increase in the maximum electricity generation output of SEP to up to 950 MW.
- E.2.2 As such, SECL is submitting the variation application to the Secretary of State, via BEIS, which primarily seeks to amend Paragraph 2 of the existing consent to allow for the increase in the permitted electricity generation output of SEP to up to 950 MW capacity.
- E.2.3 Notwithstanding the variation application process, the 2008 Planning Act<sup>5</sup> introduced a new system for the consenting of nationally significant infrastructure projects (NSIPs). This includes projects within the energy sector, including onshore generating stations with a capacity of more than 50 MW. Before such an NSIP can proceed, an application must be submitted for a Development Consent Order (DCO).
- E.2.4 In July 2011, the Secretary of State for Energy and Climate Change (now Business, Energy and Industrial Strategy) designated a number of National Policy Statements (NPSs) relating to nationally significant energy infrastructure. These included an Overarching NPS for Energy (EN-1)<sup>6</sup>, which sets out the Government's overall policy for the delivery of nationally significant energy infrastructure.
- E.2.5 EN-1 states (at paragraph 4.6.6) that: *"Under [the 2006 CHP Guidance<sup>7</sup>], 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. [...]. The [Secretary of State] should have regard to the [2006 CHP Guidance] or any successor to it when considering the CHP aspects of applications for thermal generating stations"*. Whilst not specifically stated, it is understood that the 2006 CHP Guidance is also a material consideration for variation applications under Section 36C of the 1989 Electricity Act.
- E.2.6 Paragraphs 11 and 12 of the 2006 CHP Guidance provide the relevant CHP requirements to be considered.

### ***The Purpose of this Appendix***

- E.2.7 This Appendix provides supporting combined heat and power (CHP) assessment and information to fulfil the relevant CHP requirements.
- E.2.8 Based on the 2006 CHP Guidance, Table E.2 presents the relevant CHP requirements to be considered and provides a summary of (and link to) the relevant information.

<sup>5</sup> The Planning Act 2008. Available at:

<https://www.legislation.gov.uk/ukpga/2008/29/contents>

<sup>6</sup> 'Overarching National Policy Statement for Energy (EN-1)' (Department of Energy and Climate Change (DECC) (now Department for Business, Energy and Climate Change (BEIS)), July 2011). Available at:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/47854/1938-overarching-nps-for-energy-en1.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf)

<sup>7</sup> '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' (DTI (the predecessor to DECC, now BEIS), December 2006). Available at:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/43594/Power\\_station\\_proposals\\_-\\_guidance\\_2006.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/43594/Power_station_proposals_-_guidance_2006.pdf)

**TABLE E.2: RELEVANT CHP REQUIREMENTS TO BE CONSIDERED**

<b>CHP Requirement</b>	<b>Summary of / Link to Relevant Information</b>
For all generating stations, provide evidence to show the steps taken to assess viable CHP opportunities within a CHP search area, including:	
<ul style="list-style-type: none"> <li>Explanation of the location of the generating station;</li> </ul>	The August 1996 ES <sup>8</sup> provided the explanation of the location of the generating station. Further information is provided in paragraphs E.3.7 to E.3.12.
<ul style="list-style-type: none"> <li>Identification of potential CHP opportunities within the CHP search area;</li> </ul>	The application for the original consent (and the direction that planning permission be deemed to be granted) predated the issue of the 2006 CHP Guidance, and therefore was not accompanied by a CHP Assessment. Nevertheless, during the selection of the location, consideration was given to the opportunities to integrate the generating station with local businesses / industries to provide commercial benefits, such as by offering competitively-priced power and heat. However, there were no viable CHP opportunities. For the variation application, the 2006 CHP Guidance requires that CHP Assessments examine the information available from the 'Online Industrial Heat Map'. Since the publication of the 2006 CHP guidance, the 'Online Industrial Heat Map' has been replaced with the 'UK CHP Development Map' <sup>9</sup> . Therefore, to assess any updated potential CHP opportunities, an examination of the UK CHP Development Map has been undertaken. Further information is provided in paragraphs E.3.17 to E.3.32.
<ul style="list-style-type: none"> <li>Evaluation of potential CHP opportunities within the CHP search area, including description of how to maximise any associated CHP benefits; and,</li> </ul>	Based on the examination of the UK CHP Development Map, there remain no viable current CHP opportunities. This is because the identified heat loads are spread across the CHP search area and are not representative of new heat loads, and therefore the costs and practical benefits of including them as part of any initial design cannot be realised.
<ul style="list-style-type: none"> <li>A list of any organisation(s) contacts.</li> </ul>	For the application for the original consent (and the direction that planning permission be deemed to be granted), InterGen discussed the possibility of supplying both power and heat to local business / industries within a distance that would be technically feasible and economically justifiable. For the variation application, no additional CHP-specific consultations were undertaken.
For non-CHP generating stations, provide evidence including:	
<ul style="list-style-type: none"> <li>Basis for the conclusion;</li> </ul>	See above, on the evaluation of potential CHP opportunities within the CHP search area.

<sup>8</sup> See Section 2.3 (Site Selection) of Environmental Statement Volume 1: Main Report. ('Spalding Energy Project: Environmental Statement Volume 1 – Main Report' (Environmental Resources Management, 16 August 1996)).

<sup>9</sup> UK CHP Development Map (accessed 07/08/2020). Available at: <http://chptools.decc.gov.uk/developmentmap/>

<b>CHP Requirement</b>	<b>Summary of / Link to Relevant Information</b>
<ul style="list-style-type: none"> <li>• Identification of potential future CHP opportunities within the CHP search area; and,</li> </ul>	<p>During operation, activities on the site are undertaken in accordance with an Environmental Permit. SECL already holds an Environmental Permit for SEP (EPR/BK0701IW). In May 2020, the latest version (V005) was issued under the 2016 Environmental Permitting (England and Wales) Regulations. Condition 1.2.1, on energy efficiency, requires that the operator take appropriate measures to ensure efficiencies are maximised and, at appropriate intervals, review additional opportunities for measures to ensure efficiencies are maximised / improved.</p>
<ul style="list-style-type: none"> <li>• Proposed CHP provisions within the generating station to exploit any realised potential future CHP opportunity.</li> </ul>	<p>The application for the original consent (and the direction that planning permission be deemed to be granted) predated the issue of the 2006 CHP Guidance, and therefore was not accompanied by a CHP Assessment.</p> <p>Subsequently, the existing consent (the original consent and the direction that planning permission be deemed to be granted) contains no CHP conditions or requirements. Therefore, SEP was not required to be 'CHP-Ready', and the detailed design of the CCGT generating station did not include any specific CHP-Ready design provisions.</p> <p>Nevertheless, should there be identification of economically feasible future CHP opportunities, it is anticipated that some modifications could be made to the CCGT generating station for CHP provisions to allow for the export of steam and / or hot water. Further information is provided in paragraph E.3.38.</p>

### **E.3 Consideration of Combined Heat and Power Requirements**

#### ***Consideration of CHP Requirements within the Existing Consent***

E.3.1 The application for the original consent (and the direction that planning permission be deemed to be granted) predated the issue of the 2006 CHP Guidance (the application was submitted in August 1996), and therefore was not accompanied by a CHP Assessment.

E.3.2 Subsequently, the existing consent (the original consent and the direction that planning permission be deemed to be granted) contains no CHP conditions or requirements.

#### ***Consideration of CHP Requirements as part of the Variation Application***

##### Explanation of the Location of the Generating Station

E.3.3 SEP is a CCGT generating station, located on West Marsh Road, in Spalding, Lincolnshire.

E.3.4 Figure 1 (of the main Environmental and Technical Schedule) presents the location plan for the existing SEP site and Figure 2 (of the main Environmental and Technical Schedule) ('Plan DWD 2544/2/G') presents the original application site plan referred to in the existing consent for SEP (which identifies the area of land, shown as the area outlined black, within which SEP was authorised to be constructed and is authorised to be operated).

E.3.5 SEP is located to the north of the newly constructed Spalding Energy Expansion (SEE) Open Cycle Gas Turbine (OCGT) generating station.

E.3.6 Full explanation of the location of SEP noted as part of the original application is provided in Section 2.3 (Site Selection) of the August 1996 Environmental Statement (ES) (Environmental Statement Volume 1: Main Report<sup>10</sup>).

E.3.7 Regarding the selection of Spalding for the location of the generating station, InterGen considered a number of alternative locations in England for a CCGT generating station, with the selection of Spalding due to the following advantageous features of the area:

- There were opportunities to integrate the generating station with local businesses / industries to provide commercial benefits, such as by offering competitively-priced power and heat (in the form of warm water, as a by-product of the generating station processes);
- Spalding was accessible to the National Grid Gas Transmission System (approximately 6 – 7 km), thereby limiting the potential environmental impacts of a new gas connection;
- Spalding was accessible to the National Grid Electricity Transmission System (approximately 5 km), thereby limiting the potential environmental impacts of a new electrical connection;
- There were economic benefits to the project resulting from the relative accessibility of the gas and electricity infrastructure;
- Spalding has available sites with sufficient land area (approximately 11 ha) which were suitable for the development of a generating station; and,
- The local planning policies and local development plan were compatible for a generating station proposal.

E.3.8 Regarding the selection of the SEP site for the location of the generating station, InterGen considered three alternative locations within Spalding for the CCGT generating station. Insert E.1 presents these alternative locations.

**INSERT E.1: ALTERNATIVE LOCATIONS**



E.3.9 In summary, these alternative locations comprised:

Site A:	A site comprising agricultural research land (at the time of selection, in the ownership of Elsoms Seeds), with planning permission for employment development.
Site B:	A site partly comprising agricultural land and partly comprising a disused reservoir. The site previously formed part of a sugar factory operated by British Sugar PLC which, at the time of selection, had been demolished.

<sup>10</sup> 'Spalding Energy Project: Environmental Statement Volume 1 – Main Report' (Environmental Resources Management, 16 August 1996).

Site C:	A site comprising industrial land. The site previously formed part of a sugar factory operated by British Sugar PLC which, at the time of selection, had been demolished.
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E.3.10 All three alternative sites were within the industrial area in the north of Spalding, and had been designated for industrial development. As part of the selection process, all three alternative sites were assessed in relation to their environmental setting and site characteristics. Table E.3 summarises the key issues considered in the assessment.

**TABLE E.3: KEY ISSUES CONSIDERED IN ALTERNATIVE SITE ASSESSMENT**

<b>Environmental Aspect</b>	<b>Key Issues Considered</b>
Air Quality	<ul style="list-style-type: none"> <li>• Background air quality;</li> <li>• Background dust and odour; and,</li> <li>• Factors influencing atmospheric dispersion of air pollutants.</li> </ul>
Noise and Vibration	<ul style="list-style-type: none"> <li>• Background noise climate; and,</li> <li>• Potential noise attenuation and noise screening.</li> </ul>
Ecology and Wildlife	<ul style="list-style-type: none"> <li>• Ecological habitats on site; and,</li> <li>• Ecological habitats in the surrounding area.</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>• Existing landscape character of the site;</li> <li>• Existing landscape character of the surrounding area;</li> <li>• Potential visibility of the site; and,</li> <li>• Potential landscape and visual impact.</li> </ul>
Land Use, Planning and Material Assets	<ul style="list-style-type: none"> <li>• Land uses of the surrounding area; and,</li> <li>• Agricultural resources, mature trees, mineral resources and planning designations in the surrounding area.</li> </ul>
Geology, Hydrogeology and Surface Water	<ul style="list-style-type: none"> <li>• Geology and ground conditions;</li> <li>• Ground water resources; and,</li> <li>• Surface water resources.</li> </ul>
Archaeology and Cultural Heritage	<ul style="list-style-type: none"> <li>• Archaeology on site; and,</li> <li>• Archaeology and cultural heritage in the surrounding area.</li> </ul>
Traffic	<ul style="list-style-type: none"> <li>• Main road network of the surrounding area; and,</li> <li>• Potential site access.</li> </ul>

E.3.11 Based on the assessment, there were no over-riding reasons to reject any of the alternative sites. However, Site B and Site C (which were previously part of the sugar factory operated by British Sugar PLC) represented opportunities to redevelop and reuse former industrial land. Furthermore, after consideration of the gas and electrical connection requirements, Site B became less favourable than Site C due to access restrictions.

E.3.12 Therefore, Site C was selected as the location of the generating station.

[Identification of Potential CHP Opportunities within the CHP Search Area](#)

E.3.13 As noted above, the application for the original consent (and the direction that planning permission be deemed to be granted) predated the issue of the 2006 CHP Guidance, and therefore was not accompanied by a CHP Assessment. Nevertheless, during the selection of the location, consideration was given to the opportunities to integrate the generating station with local businesses / industries to provide commercial benefits, such as by offering competitively-priced power and heat. However, there were no viable CHP opportunities.

E.3.14 Furthermore, within the letter accompanying the original consent (and the direction that planning permission be deemed to be granted), the Secretary of State noted:

- At paragraph 6.1, “the Government strongly supports combined heat and power (CHP) and would expect developers to show that they had explored opportunities to use it”;

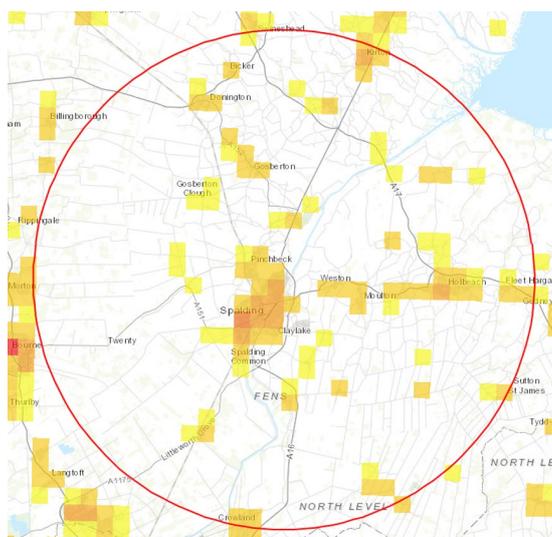
- At paragraph 6.2, “the Secretary of State accepts that there is no significant existing industrial user of heat in the area which would justify the Development being CHP. He has no reason to doubt that the Company has discussed the possibility of supplying heat and power to industries within a distance which would be economically justifiable and delivery heat / steam at sufficient pressure to warrant CHP classification. This is further evidenced by the Company’s willingness to supply electricity and heat to existing industries in the area at a price lower than that currently available”; and,
- At paragraph 6.5, “the Secretary of State is of the view that the Company has adequately explored the possibility of CHP but there is no significant heat load within a reasonable distance of the site to justify its operation”.

E.3.15 The existing consent contains no CHP Conditions or requirements.

E.3.16 For the variation application, the 2006 CHP Guidance requires that CHP Assessments examine the information available from the ‘Online Industrial Heat Map’. Since the publication of the 2006 CHP guidance, the ‘Online Industrial Heat Map’ has been replaced with the ‘UK CHP Development Map’<sup>11</sup>. Therefore, to assess any updated potential CHP opportunities, an examination of the UK CHP Development Map has been undertaken.

E.3.17 Based on the examination of the UK CHP Development Map, covering a search area of 15 km<sup>12</sup> centred on the existing SEP and Proposed Development site<sup>13</sup> (the CHP search area), Insert E.2 presents the location of the heat loads (i.e. potential CHP opportunities) and Table E.4 presents the associated breakdown of the heat loads.

**INSERT 7.2: LOCATION OF THE HEAT LOADS**



**TABLE E.4: BREAKDOWN OF THE HEAT LOADS**

<b>Sector</b>	<b>MWh Heat Load</b>	<b>Share</b>
Communications and Transport	71.7	0.01%
Commercial Offices	4,108.8	0.80%
District Heating	0.0	0.00%
Domestic	456,243.8	89.24%
Education	5,774.9	1.13%

<sup>11</sup> UK CHP Development Map (accessed 07/08/2020). Available at:

<http://chptools.decc.gov.uk/developmentmap/>

<sup>12</sup> When identifying potential CHP opportunities, EN-1 states (at paragraph 4.6.5) that: “to be economically viable as a CHP plant, a generating station needs to be located close to industrial or domestic customers with heat demands. The distance will vary according to the size of the generating station and the nature of the heat demand, but is likely to mean within a distance of 15 km”.

<sup>13</sup> Existing SEP and Proposed Development site: PE11 3BB.

Government Buildings	248.8	0.05%
Hotels	741.0	0.14%
Large Industrial	0.0	0.00%
Health	524.7	0.10%
Other	397.1	0.08%
Small Industrial	38,263.8	7.48%
Prisons	0.0	0.00%
Retail	1,775.2	0.35%
Sport and Leisure	312.7	0.06%
Warehouses	2,769.9	0.54%
<b>Total MW Heat Load in the CHP Search Area</b>	<b>511,232.4</b>	-

E.3.18 Based on Insert E.2, the main heat load 'centre' is that related to the largest settlement of Spalding and, based on Table E.4, the three largest heat loads within the CHP search area are related to:

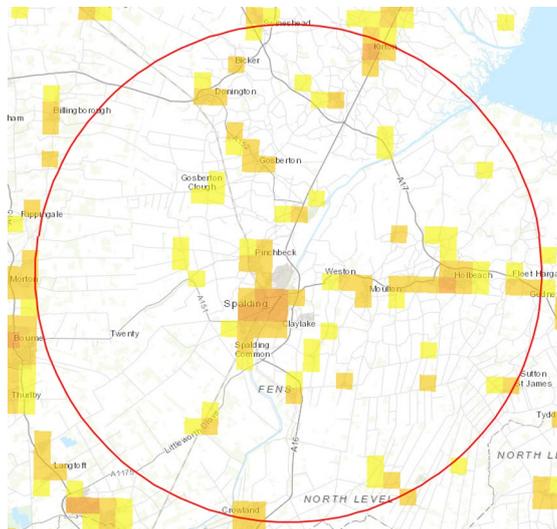
- 'Domestic' (89.24%);
- 'Small Industrial' (7.48%); and,
- 'Education' (1.13%).

E.3.19 In addition, there are no large heat loads within the CHP search area. Within the next sub-Sections, the 'Domestic', 'Small Industrial' and 'Education' heat loads are examined further.

#### *'Domestic' Heat Loads*

E.3.20 Based on the updated examination of the UK CHP Development Map, Insert E.3 presents the locations of the 'Domestic' heat loads within the CHP search area.

#### **INSERT E.3: LOCATIONS OF THE 'DOMESTIC' HEAT LOADS**



E.3.21 The breakdown indicates that the 'Domestic' heat load within the CHP search area is 456,244 MW, approximately 89.24% of the total heat load.

E.3.22 Based on Insert E.3, the 'Domestic' heat load is spread across the CHP search area, in particular Spalding and the smaller settlements to the north and east of the existing SEP and Proposed Development site (including Bicker, Donington, Gosberton and Pinchbeck to the north, and Weston, Moulton and Holbeach to the east). As the 'Domestic' heat load is spread across the CHP search area (i.e. is characterised by disparate, smaller settlements) and is not representative of a new heat load, the costs and practical benefits

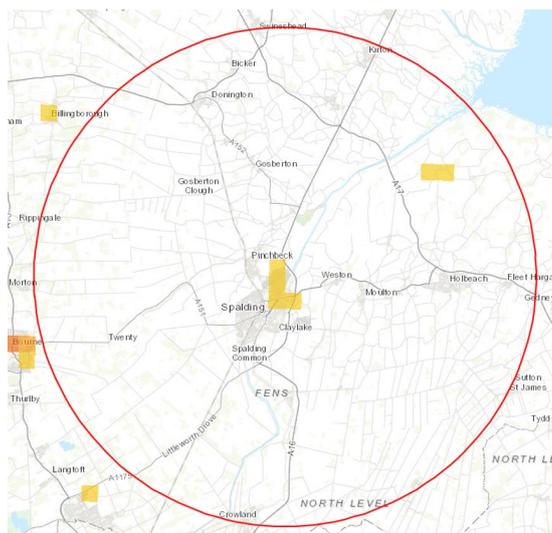
of including it as part of any initial design cannot be realised<sup>14</sup>. Furthermore, it is also understood that there are no proposals for any new large-scale residential settlements within the CHP search area.

- E.3.23 Furthermore, generally speaking, CHP is more attractive in cases where the heat load is constant (and large) throughout the year. Typically, this is the case with chemical plants, factories and refineries which depend upon continuous processes and use large amounts of heat (usually supplied as steam). CHP is less attractive in cases where the heat load is seasonal and / or intermittent. Typically, this is the case with 'Domestic' / district heating schemes in countries which have a relatively short winter heating seasons (such as the UK, when compared to Eastern European and Scandinavian countries). As such, there is a general absence of significant 'Domestic' / district heating schemes in the UK and, where these are developed, these schemes are generally associated with new-build publicly funded and often high-rise housing where the heat loads can be readily combined and the heat distribution piping is compact.
- E.3.24 Therefore, the 'Domestic' heat load is not considered to be a viable current CHP opportunity.

#### *'Small Industrial' Heat Loads*

- E.3.25 Based on the updated examination of the UK CHP Development Map, Insert E.4 presents the locations of the 'Small Industrial' heat loads within the CHP search area.

#### **INSERT E.4: LOCATIONS OF THE 'SMALL INDUSTRIAL' HEAT LOADS**



- E.3.26 The breakdown indicates that the 'Small Industrial' heat load within the CHP search area is 38,264 MW, approximately 7.48% of the total heat load.
- E.3.27 Based on Insert E.4, the 'Small Industrial' heat load is located in two disparate areas. Therefore (similar to the 'Domestic' heat load), as the 'Small Industrial' heat load is spread across the CHP search area and is not representative of a new heat load, the costs and practical benefits of including it as part of any initial design cannot be realised.
- E.3.28 Therefore, the 'Small Industrial' heat load is not considered to be a viable current CHP opportunity.

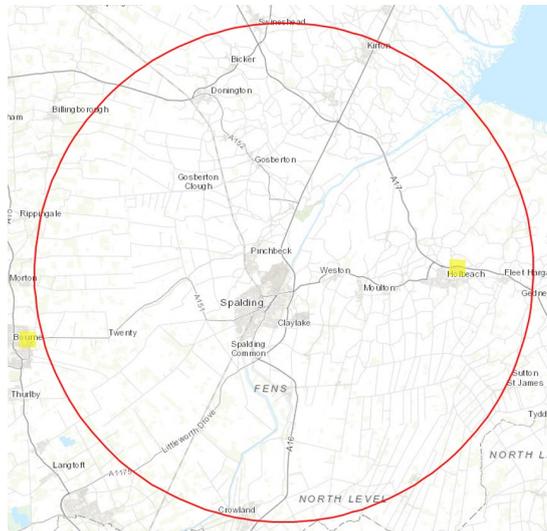
<sup>14</sup> In considering 'Domestic' heat loads, EN-1 states (at paragraph 4.6.5) that: "A 2009 Report for DECC on district heating networks suggested that, for example, a district heating network using waste heat from a generating station would be cost-effective where there was a demand for 200 MWth of heat [assumed to be in a concentrated area] within 15 km. Additionally, the provision of CHP is most likely to be cost-effective and practical where it is included as part of the initial design and is part of a mixed-use development. For example, retrofitting a district heating network to an existing housing estate may not be efficient".

The 2009 Report for DECC on district heating networks is: 'The Potential and Costs of District Heating Networks' (Pöyry and Faber Maunsell, April 2009).

*'Education' Heat Loads*

E.3.29 Based on the updated examination of the UK CHP Development Map, Insert E.5 presents the locations of the 'Education' heat loads within the CHP search area.

**INSERT E.5: LOCATIONS OF THE 'EDUCATION' HEAT LOADS**



E.3.30 The breakdown indicates that the 'Education' heat load within the CHP search area is 5,775 MW, approximately 1.13% of the total heat load.

E.3.31 Based on Insert E.5, the 'Education' heat load is located in Holbeach. Therefore (similar to the 'Domestic' and 'Small Industrial' heat loads), as the 'Education' heat load is not representative of a new heat load, the costs and practical benefits of including it as part of any initial design cannot be realised.

E.3.32 Therefore, the 'Education' heat load is not considered to be a viable current CHP opportunity.

[Evaluation of Potential CHP Opportunities within the CHP Search Area / Basis for the Conclusion](#)

E.3.33 Based on the examination of the UK CHP Development Map, there remain no viable current CHP opportunities. This is because the identified heat loads are spread across the CHP search area and are not representative of new heat loads, and therefore the costs and practical benefits of including them as part of any initial design cannot be realised.

[Identification of Potential Future CHP Opportunities within the CHP Search Area](#)

E.3.34 During operation, activities on the site are undertaken in accordance with an Environmental Permit. SECL already holds an Environmental Permit for SEP (EPR/BK0701IW). In May 2020, the latest version (V005) was issued under the 2016 Environmental Permitting (England and Wales) Regulations. Condition 1.2.1, on energy efficiency, requires that the operator take appropriate measures to ensure efficiencies are maximised and, at appropriate intervals, review additional opportunities for measures to ensure efficiencies are maximised / improved.

E.3.35 Notwithstanding, should there be identification of a potential future CHP opportunity, ultimate implementation of CHP will be depending on a number of factors. These factors include:

- Economic feasibility;
- Compatibility between the operating regime of SEP with the requirements of the Heat Load; and,
- Compatibility with any specific Energy Policies associated with the Heat Load.

CHP Provisions within the Generating Station

- E.3.36 As noted above, the application for the original consent (and the direction that planning permission be deemed to be granted) predated the issue of the 2006 CHP Guidance, and therefore was not accompanied by a CHP Assessment.
- E.3.37 Subsequently, the existing consent (the original consent and the direction that planning permission be deemed to be granted) contains no CHP conditions or requirements. Therefore, SEP was not required to be 'CHP-Ready', and the detailed design of the CCGT generating station did not include any specific CHP-Ready design provisions.
- E.3.38 Nevertheless, should there be identification of economically feasible future CHP opportunities, it is anticipated that some modifications could be made to the CCGT generating station for CHP provisions to allow for the export of steam and / or hot water. These modifications include:
- Tie-in locations in either:
    - For higher pressure steam (between 20 to 40 bar), the cold re-heat line from the High Pressure (HP) steam turbine exhaust; or,
    - For lower pressure steam (less than 10 bar), the crossover between the Intermediate Pressure (IP) steam turbine exhaust and the Low Pressure (LP) steam turbine inlet; and,
  - Additional control systems.

**E.4 Conclusions**

- E.4.1 Whilst the possibilities for CHP have been explored and updated, there remains no viable CHP opportunities. Therefore, it is considered that the variation application is compliant with the relevant CHP requirements.