

WEALDEN WORKS 3Rs PERMIT VARIATION APPLICATION

Appendix I: CHP-Ready Assessment

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CHP-R Report
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1 INTRODUCTION

1.1 Purpose and Structure of this Report

- 1.1.1 This report presents a Combined Heat and Power Ready (CHP-R) assessment for the proposed Wealden Works Recycling, Recovery and Renewable energy (3Rs) facility at Langhurstwood Road, Horsham, RH12 4QD. This report is submitted with the application to vary environmental permit EPR/CB3308TD, made by Britaniacrest Recycling Limited. The permit variation application has been prepared to cover the addition of an energy recovery facility (ERF) and mechanical sorting plant to the permitted waste transfer station (WTS) activity. There is a current operational WTS facility that will be replaced by the Wealden Works 3Rs Facility.
- 1.1.2 This report is structured in accordance with the guidance presented in the Environment Agency's (EA's) 'CHP Ready Guidance for Combustion and Energy from Waste Power Plants'¹. This report is set out into the following sections:
- Section 2 – Project Description.
 - Section 3 – Requirements for CHP. This section outlines the requirements for CHP set out in UK policy and guidance.
 - Section 4 – Potential Local Heat Demand. This section provides a summary of potential local heat demands based on the DECC CHP map.
 - Section 5 – Conclusions.
- 1.1.3 The CHP-R Assessment Form in Appendix I.1 to this report was completed using the EA's CHP-R Assessment template.

1.2 Site Description

- 1.2.1 The Wealden 3Rs site is located at Former Wealden Brickworks Waste Transfer Station, Langhurstwood Road, Horsham, West Sussex, RH12 4QD. The approximate National Grid Reference for the facility is TQ 17148 34313.
- 1.2.2 The site lies approximately 900 m to the north west of Horsham and 1.3 km to the north east of Warnham.
- 1.2.3 The site is accessed from a private shared estate road, which connects to the public highway of Langhurstwood Road. Langhurstwood Road links directly to the A264 approximately 750 m to the south.
- 1.2.4 The site has an area of approximately 3.8 hectares (ha) and includes a large warehouse-type building currently in use as a Waste Transfer Station (WTS) / Materials Recycling Facility (MRF) under the existing permit (EPR/CB3308TD). The site almost entirely comprises existing concrete hard standing.
- 1.2.5 The southern boundary of the site is defined by the internal access road, beyond which lies the Weinerberger brickworks factory (also known as Warnham Brickworks). The London-Horsham railway line lies immediately to the west of the site, beyond which there are mature tree belts and open countryside.
- 1.2.6 The eastern boundary of the site is defined by an internal access road, beyond which lies the Biffa Brookhurst Wood Mechanical and Biological Treatment (MBT) Facility. To the north of the MBT Facility lies an ecological habitat area.

¹ Environment Agency (2013). CHP Ready Guidance for Combustion and Energy from Waste Power Plants, V1.0, February 2013. Available online: <https://www.gov.uk/government/publications/energy-efficiency-for-combustion-and-energy-from-waste-power-plants>

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- 1.2.7 Two ponds are located within dense scrub to the immediate north of the site, surrounded by grey willow, hawthorn and blackthorn. The land to the immediate north and beyond the ponds is currently vacant and comprises several derelict former brickworks buildings.
- 1.2.8 Approximately 315 metres to the north of the site boundary is an Aggregate Treatment and Recycling Facility (ATRF). Further north and east of the ATRF is the active Brookhurst Wood Landfill Site. A leachate treatment plant and gas management compound and associated infrastructure is located between the ATRF and the landfill.
- 1.2.9 There are no residential receptors within the site. Residential properties in closest proximity to the site include:
- Langhurst Moat Cottage and Wealden, Langhurstwood Road lie approximately 210 metres south east of the site and several residential properties on Langhurstwood Road, lie approximately 370 metres south east of the site.
 - Grayland's Lodge, on Langhurstwood Road, lies approximately 330 metres to the north east of the site;
 - Residential properties on Station Road lie approximately 330 metres south of the site;
 - Cox Farm lies approximate 420 metres north west of the site; and
 - A proposed residential development at North Horsham once built will be located approximately 450 metres south east of the site.
- 1.2.10 Further information regarding potential heat users is provided in Section 4.

2 PROJECT DESCRIPTION

- 2.1.1 Britaniacrest Recycling Limited is currently permitted to operate a waste transfer station (WTS) at the site. There is a current operational WTS facility that will be replaced by the Wealden Works 3Rs Facility. The WTS is permitted to accept a range of wastes including household, commercial, industrial and construction and demolition waste. The permitted activities include manual and mechanical sorting or separation, screening, washing, shredding, baling and crushing of waste. The WTS is permitted to accept up to 200,000 tonnes per annum (tpa) of waste.
- 2.1.2 The variation application proposes to install a new ERF and mechanical sorting plant in addition to the WTS. The proposed ERF will be designed to take up to 230,000 tpa of residual waste either directly delivered to the ERF bunker or from the WTS/mechanical sorting, after the inert and recyclable materials have been separated out.
- 2.1.3 The new ERF will have a thermal input of 76.7 MW and will generate up to 24.4 MW, with a parasitic load of 3.1 MW. The new ERF will supply 21.3 MW of electricity to the National Grid. The turbine will be configured to be able to export heat as well, but it will operate in electricity generation mode until a suitable distributed energy network is developed. The plant will have the capacity to deliver at least 12 MW_{th} of heat, subject to technical and economic feasibility. Over the proposed 8,000 hours of operation per annum, this is 96,000 MWh. The plant thermal capacity would be 640,000 MWh if it were solely dedicated to heat production with no production of electricity.
- 2.1.4 The fuel used at the ERF will be commercial & industrial waste (C&I) and municipal solid waste (MSW) and the plant will utilise dry low NO_x (DLN) burners.
- 2.1.5 The primary components of the plant will be:
- Waste acceptance, handling and storage
 - Mechanical sorting and materials segregation
 - Thermal treatment of waste in a moving grate furnace
 - Waste transfer
 - Electricity generation (a single steam turbine will generate electricity which will be exported to the Grid and used onsite to power the internal electrical systems)
 - Flue gas treatment (selective non-catalytic reduction for control of nitrogen oxides, dry injection of lime and activated carbon for control of acid gases, dioxins and furans and mercury, and a bag filter for control of particulates, including heavy metals)
 - 95 m exhaust stack
 - Management of residues (incinerator bottom ash, boiler ash and air pollution control residues)

3 REQUIREMENTS FOR CHP IN UK POLICY AND GUIDANCE

3.1.1 Consideration of CHP is a requirement detailed within Section 4.6 of the ‘Overarching National Policy Statement for Energy (EN-1)’².

3.1.2 Paragraph 4.6.6 of EN-1 states that:

“Under guidelines issued by DECC (then DTI) in 2006 [the CHP Guidance³], 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.”

3.1.3 Paragraph 4.6.6 continues:

“The same principle applies to any thermal power station which is the subject of an application for development consent under the Planning Act 2008.”

3.1.4 EN-1 goes on to state:

“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.”

3.1.5 Paragraph 24 of the CHP Guidance 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-opping, support to local industry, etc.), will primarily be driven by the market...”

3.1.6 EN-1 requires that developers consider the opportunities for CHP when considering locations for their project. It emphasises the value of early consultation with bodies such as Local Enterprise Partnerships (LEPs) and Local Authorities in order to identify potential heat users (i.e. customers). The Environment Agency (EA) will also be consulted on the application (including its consideration of CHP) as part of the DCO examination process.

3.1.7 The EA has published its own ‘CHP Ready Guidance for Combustion and Energy from Waste Plants’⁴(2014) (CHP-R Guidance) since the CHP Guidance was published. Section 3.3 of the CHP-R Guidance states that:

“When consulted by the Planning Authorities on relevant consent applications for new plants, the Environment Agency will highlight the need for the plant to be CHP or CHP-R and will make reference to this CHP-R Guidance. Where a DCO is required, the Environment Agency will additionally comment on the results of the CHP Assessment.”

3.1.8 A CHP Assessment submitted with a permit application should contain the following details, as set out in the CHP-R Guidance (based on Section 4.6 of EN-1):

² Department of Energy & Climate Change, 2011. Overarching National Policy Statement for Energy (EN-1), London: The Stationery Office, July 2011. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf

³ Department of Energy & Climate Change (then DTI), 2006. 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 Environment Agency, 2013. CHP Ready Guidance for Combustion and Energy from Waste Power Plants, February 2013.

- *“An explanation of their choice of location, including the potential viability of the site for CHP;*
- *A report on the exploration carried out to identify and consider the economic feasibility of local heat opportunities and how to maximise the benefits from CHP;*
- *The results of that exploration; and*
- *A list of organisations contacted.*
- *And, if the proposal is for generation without CHP:*
- *The basis for the developer’s conclusion that it is not economically feasible to exploit existing regional heat markets;*
- *A description of potential future heat requirements in the area; and*
- *The provisions in the proposed scheme for exploiting any potential heat demand in the future.”*

3.1.9 Paragraph 4.6.8 of EN-1 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.”*

3.1.10 For plants with planning permission granted for “generation without CHP”, the Environmental Permit application should build on the CHP Assessment to demonstrate CHP readiness, with the submission of a CHP-R Assessment in line with the CHP-R Guidance.

3.1.11 Section 4 of the CHP-R Guidance sets out that a CHP-R Assessment should demonstrate:

“that the new plant is designed to be ready, with minimum modification, to supply heat in the future.”

3.1.12 The term ‘minimum modification’ is described in Section 4 as representing:

“an ability to supply heat in the future without significant modification of the original plant / equipment. For example, a CHP-R plant will not be required to replace major items of original plant / equipment, but should retain the capability for additional plant / equipment to be installed at a later date.”

3.1.13 Section 4 goes on to state:

“In this regard, the CHP-R Assessment allows for the provision of supporting information regarding any appropriate technical provisions which demonstrate that the new plant is ready to supply heat in the future. As these technical provisions are provided alongside a justification of the chosen location and selected heat loads, it is noted that the degree to which any new plant will be CHP-R will be location-specific.”

3.1.14 The requirements for the CHP-R Assessment comprise:

1. Plant, Plant Location and Potential Heat Loads
2. Identification of ‘CHP Envelope’
3. Operation of Plant with the Identified Heat Load
4. Technical Provisions and Space Requirements
5. Integration of CHP and Carbon Capture

6. Economics of CHP-R

- 3.1.15 The assessment should not only identify the extent to which the new plant will be CHP-R, but also whether the proposals represent Best Available Techniques (BAT), in accordance with the Industrial Emissions Directive (IED) definition.
- 3.1.16 This document addresses the requirements for the provision of information identified in the above policy and guidance.

4 POTENTIAL LOCAL HEAT DEMAND

4.1 UK CHP Development Map

4.1.1 To understand initially the theoretical potential for heat demands in the area local to the proposed ERF associated with the Wealden 3Rs facility, information has been drawn from the DECC online CHP development map⁵. The EA guidance proposes a search radius of 10 km for plants less than 300 MW. Figure 4.1 and Figure 4.2 show the results of that search.

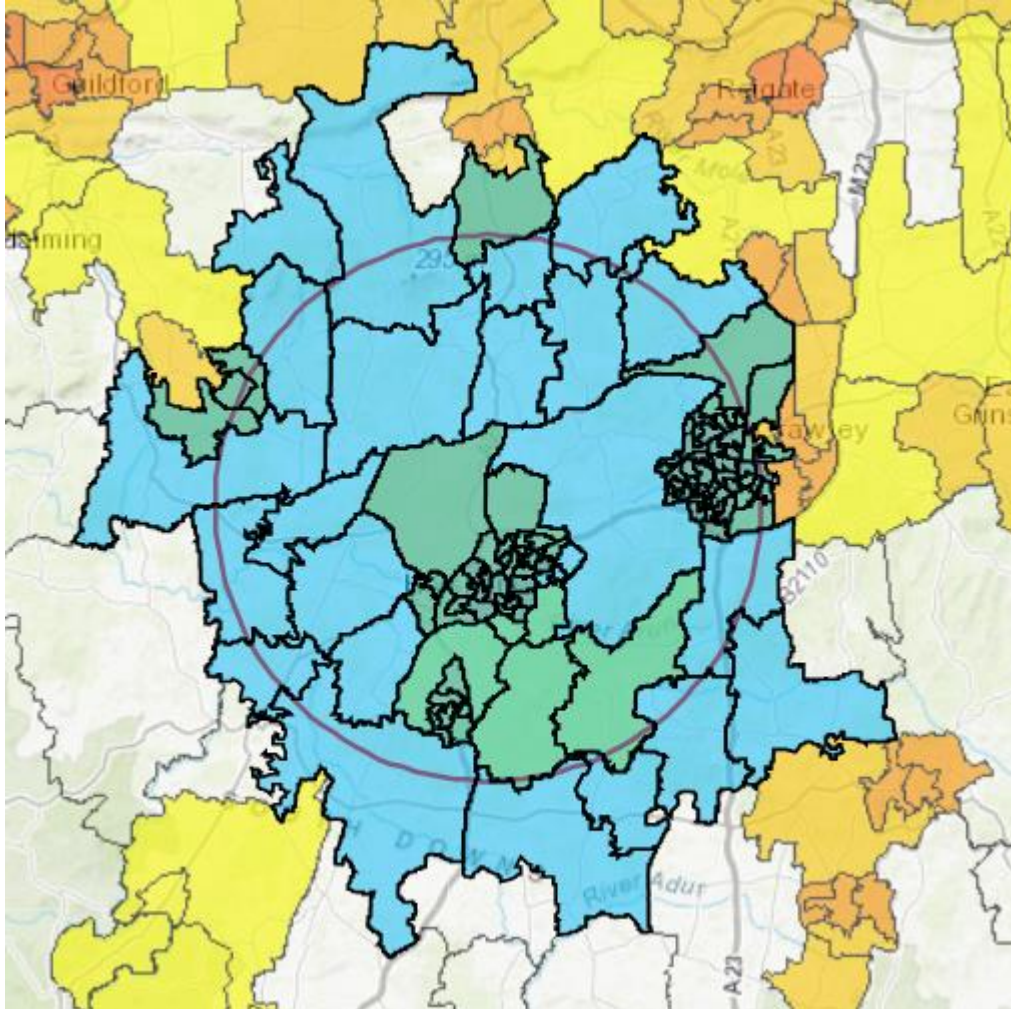


Figure 4.1. Map of potential heat loads within a 10 km radius of the proposed development (marked with a cross on the map)

4.1.2 Figure 4.2 shows the potential heat loads within the 10 km search radius. It shows that the largest potential heat users are domestic, with an approximate requirement of 868,831 MWh, and comprising more than 89% of the total heat demand. There are no large heat load sites recorded within the search area.

⁵ Department for Business, Energy & Industrial Strategy. UK CHP Development Map. Available online: <https://chptools.decc.gov.uk/developmentmap>

Sector Name	Share	Total MWh
Communications and Transport	8.35%	81,190 MWh
Commercial Offices	0.12%	1,153 MWh
Domestic	89.34%	868,831 MWh
Education	0.17%	1,664 MWh
Government Buildings	0.01%	77 MWh
Hotels	0.68%	6,568 MWh
Large Industrial	0.99%	9,606 MWh
Health	0.04%	365 MWh
Other	0.03%	252 MWh
Small Industrial	0.06%	631 MWh
Prisons	0%	0 MWh
Retail	0.06%	570 MWh
Sport and Leisure	0.15%	1,459 MWh
Warehouses	0.01%	133 MWh
District Heating	0%	0 MWh
Total heat load in Area		972,499 MWh

Figure 4.2. Potential heat loads within a 10 km radius of the proposed Wealden 3Rs facility by sector

4.1.3 The report in Appendix I2 was submitted in 2016 for the planning application and also describes potential heat users in the vicinity of the plant. The only major development identified was “Land North of Horsham”, proposed by Legal & General, and which has been delayed due to the covid-19 pandemic. The report from planning stated that the maximum potential heat load within 1km of the site was 32,117 MWh of which 5,770 MWh was industrial. This doesn’t include Land North of Horsham as this has not been developed yet.

4.2 The Local Area

4.2.1 The main populated areas surrounding the site are Horsham and Warnham, with a few other small towns and villages and parts of Crawley just inside the 10 km radius. Note that the Land North of Horsham will be within the 10 km radius once completed.

4.2.2 The large industrial heat load is presumed to be the neighbouring Wienerberger Brickworks site. The Wealden 3Rs site is primarily surrounded by domestic heat loads, but with some communications and transport heat loads, at least some of which is presumed to be associated with Gatwick Airport, which lies just outside of the 10 km radius.

4.3 Potential Heat Demand from Identified Loads

4.3.1 A suitable heat load has not been identified in the local area. The distance to some theoretical heat load areas identified in Section 4.1.3 (i.e. the town of Horsham, which ranges from 0.9 km to approximately 4.3 km south of the development, and Warnham, which ranges from 1.2 km to 2 km west of the development, for domestic demand) may be too great for much, if any, useful heat to be transmitted. Average distribution losses of 6–28% of the heat generated by facilities serving

distribution networks ranging from 1 km to greater than 10 km in length were found in DECC's 'Assessment of the Costs, Performance, and Characteristics of UK Heat Networks'^[6]. The assessment identified maximum distribution losses of up to 43% of the heat generated; the report suggested that higher distribution losses are due to thermal losses in internal pipework within buildings, such as in communal heating systems serving apartment blocks. If the heat is not all being distributed to the same place, these losses would be incurred for each different distribution network involved. The towns of Horsham and Warnham are also located on the other side of the physical barrier of the A24 and A264 roads.

4.3.2 Additionally, some of the smaller heat loads identified (i.e. scattered individual properties as identified in paragraph 1.2.9) are diffuse in nature and present the challenge of matching the demand profile with the plant heat generation.

4.3.3 Possible links to the existing industrial sites surrounding the proposed ERF site are being explored, but no heat loads have been secured at the time of applying for the permit application.

4.4 CHP-Readiness

4.4.1 The plant will be CHP-ready from the outset. However, of the potential heat demands identified, Britaniacrest has not yet found a suitable recipient that is also willing to accept the proposed heat load. This will be reviewed prior to commissioning and throughout the operation of the facility.

4.4.2 There are businesses to the north east of the 3Rs facility, but these are mainly office-based and are considered too small to present a viable heat load opportunity. The large industrial potential heat user is presumed to be the Wienerberger Brickworks facility located across the road from the 3Rs facility. However, talks have not resulted in any viable heat load being agreed as yet.

4.4.3 A meeting was held with Legal & General in April 2019 and the prospect of distributed heating to the proposed "Land North of Horsham" scheme discussed. However Legal & General would not consider it further. The only element of the mixed-use development currently moving forward is a school. It is considered that pursuing domestic heating with Legal & General at this time is not viable. When possible, Britaniacrest will approach the local council regarding the school, but the heat load will be minor and unlikely to be a viable option on its own.

4.5 CHP Envelope

4.5.1 As the plant will be CHP ready, it has a known heat load size and profile from the outset, and therefore an optimal design for electrical power generation with heat generation can be achieved, including optimised extraction points. However, this information will not be known until the design stage has been completed. Requirements 1 and 2 of the CHP-R Assessment Form in Appendix I1 have therefore been filled out with as much information as is currently available to Britaniacrest.

4.5.2 As there has been no heat load identified, the remaining sections of the CHP-R assessment form are not applicable.

5 CONCLUSIONS

- 5.1.1 The proposed Wealden ERF will be CHP-ready from the outset.
- 5.1.2 The potential heat demand in the local area has been considered but a suitable heat load has not yet been secured for the proposed plant. The current heat load in the area around the Wealden 3Rs site is relatively small with a low density of consumers. This will be reviewed prior to commissioning and at regular intervals throughout the life of the facility.
- 5.1.3 As the proposed ERF will be CHP-ready from the outset, it is considered BAT and an economic assessment is not required.

REFERENCES

1. Environment Agency (2013). CHP Ready Guidance for Combustion and Energy from Waste Power Plants, V1.0, February 2013. Available online: <https://www.gov.uk/government/publications/energy-efficiency-for-combustion-and-energy-from-waste-power-plants>
2. Department of Energy & Climate Change, 2011. Overarching National Policy Statement for Energy (EN-1), London: The Stationery Office, July 2011. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
3. Department of Energy & Climate Change (then DTI), 2006. 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. Environment Agency, 2013. CHP Ready Guidance for Combustion and Energy from Waste Power Plants, February 2013.
5. Department for Business, Energy & Industrial Strategy. UK CHP Development Map. Available online: <https://chptools.decc.gov.uk/developmentmap>

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Appendices

Appendix I.1

CHP-R Assessment Form

Appendix I.2

Potential Heat Users Report 2016

Appendix I.3

Primary Energy Savings Spreadsheet