CHP ASSESSMENT

Grid Powr (UK) Limited
Energy Production Facility

Prepared by:
Sol Environment Ltd

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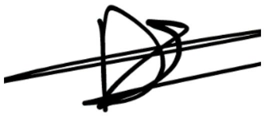
<tr><td colspan="2">Signature:</td><td colspan="2"></td></tr>
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1. HEAT EXPORT FEASIBILITY STUDY

Introduction

This document has been prepared by Sol Environment Ltd on the behalf of Grid Powr (UK) Limited (hereafter referred to as 'GP' or the 'Applicant') for the proposed operation of an Energy from Waste (EfW) Plant at their site on at Houghton Main Energy Centre. This document supports the wider Environmental Permit (EPR) application for the site and associated processes.

The document is a desk-based study detailing the demand and initial feasibility for exportation of heat from the proposed development.

The plant has been designed and configured to export power to the National Grid. The facility will generate up to 16 MWe of electricity in full condensing mode and has a parasitic load of approximately 1.7 MWe. The export capacity of the Facility is approximately 12.7 MWe.

The Plant will have the potential capacity to export up to 24 MWth of heat. The maximum heat capacity will be subject to the requirements of the heat consumers and confirmed during the detailed feasibility stages, should a commercially viable heat offtake be identified.

This report identifies potential commercially viable existing heat consumers as well as prospective heat consumers within a 10 km study area. The design of the plant will be aligned with BAT guidance given in '*CHP Ready Guidance for Combustion and Energy from Waste Power Plants*'.

2. TECHNOLOGY DESCRIPTION

Refuse Derived Fuel (RDF) will be delivered directly to the Fuel Reception Hall. HGV's will unload in the internal offloading area and a visual inspection will take place. The delivered RDF feedstocks will then be transferred directly to the pre-processing equipment which consists of two shredders, two magnetic separators and two eddy-current separators. Once pre-processed the RDF will then be transferred to one of two bunkers for storage prior to loading via crane into the hybrid combustion system.

The site will have two gasification and combustion lines each with an independent fuel feed system. The fuel feed system will deliver the waste into the system where the waste will be gasified to produce a synthetic gas (syngas). The syngas is then combusted for the purposes of raising superheated steam through a steam boiler plant, which is subsequently passed to a Steam Turbine and Generator for the production of renewable electricity. The gross electrical output of the plant is up to 16MWe.

Exhaust steam from the turbine is then sent to an air cooled condenser (ACC) to be condensed and returned to the system.

Detailed Computational-Fluid-Dynamic modelling (CFD) of the gasification and combustion process will be carried out to demonstrate syngas production and complete combustion of the fuels under varying conditions and also to guarantee the 2 seconds minimum syngas combustion time above 850°C as compliance with IED.

Flue gas cleaning and pollution control consists of Selective Non-Catalytic Reduction (SNCR) through ammonia hydroxide injection within the combustion chambers, Selective Catalytic Reduction (SCR) through ammonia hydroxide injection into the flue gas after the bag filtration unit, sodium bicarbonate injection for acid gas neutralisation and activated carbon powder injection for absorption and removal of heavy metals, dioxins, VOCs and other harmful substances.

Heat can be extracted from the plant on several thermal levels (temperature levels). Plant has the possibility for steam extraction at higher temperatures (150 – 180 °C) in form of saturated steam (or slightly superheated) for industrial customers and at temperature of up to 100°C for heating purposes where heat is transferred in form of hot water.

The plant has been configured to maximise power generation and can be configured for CHP mode operation. The turbine has the capacity to operate in CHP mode and steam could be diverted to heat exchangers if required (CHP-ready). Lower (low value) temperature (55^{o}C) hot water can be provided via the air cooled condenser circuits without impacting the overall electrical output of the facility.

3. HEAT DEMAND INVESTIGATION

The base case for export of energy from the facility will be electrical power. In 100% power generation mode, the heat energy generated by the boiler is used solely by the steam turbine. A full Heat and Mass Balance diagram can be found in Annex 1.

A review of the existing and future potential energy demands within the vicinity of the facility has been undertaken within a 10 km radius of the site. The potential heat consumers have been identified using heat mapping tools and visual inspection of maps.

The viability of connecting the proposed development with potential heat users has been considered on the basis of export capacity and distance from the site. Where present, larger heat consumers and those in close proximity to the site have been prioritised ahead of other consumers. Unfortunately, based on the initial study, no large scale users have been identified in the immediate surroundings of the site with no existing heat distribution networks known to be available or proposed.

3.1 National Heat Map

The Department for Business, Energy and Industrial Strategy (BEIS) UK CHP Development Map [1] has been utilised to carry out a review of potential heat loads within 10km of the site.

The table below shows a breakdown of the heat demand of all sectors and building types within a 10km radius of the site.

Table 3.1: Local Heat Demand within 10km by Sector		
Sector	Total MWh	Share
Communications and Transport	2935	0.16%
Commercial Offices	13,523	0.74%
Domestic	1,546,972	84.42%
Education	50,880	2.78%
Government Buildings	4,452	0.24%
Hotels	13,990	0.76%

[1] https://chptools.decc.gov.uk/developmentmap

Large Industrial	81,269	4.43%
Health	10,132	0.55%
Other	2,644	0.14%
Small Industrial	69,030	3.77%
Prisons	0	0%
Retail	21,553	1.18%
Sport and Leisure	8,869	0.48%
Warehouses	6,324	0.35%
District Heating	0	0%
Total Heat Load in Area	**1,832,575**	**100%**

The primary sector for heat demand within the 10km radius of the site is domestic household use, requiring 1,546,972 MWt and making up 84.42% of the total share, the second highest rating is for Large Industry, needing 81,269 MWt (4.43% of the total share).

Including domestic properties within a heat network comes with challenges due to the high costs of replacing existing heating systems, the highly variable daily and seasonal nature of the heat demand and the complexities connecting a number of small heat consumers to a network. However, large new scale high density housing developments can represent a potential viable option should they be developed within a commercially viable distance to the site.

3.2 Large Heat Consumers

There are two Large Heat Loads within 10km of the site, determined through using the DBEIS UK CHP Development Map.

These are both unknown operators, with a combined heat load of 76,287 MW, making up 4.16% of the total share of heat in the 10km radius, notably, neither of these are found within 4km of the site.

Table 3.2 shows a summary of the large heat loads within 10km.

Table 3.2: Large Heat Loads within 10km		
Operator (Estimated)	Heat Demand (MWh/annum)	Approximate distance from site (km)
Ardagh Glass	30,986	4.77
Monckton Coke and Chemical Co	45,301	6.96

The identification of these potential heat loads was gathered from the BEIS CHP Development Map, however users are not specifically identified, therefore the operators have been assumed based on the approximate location.

Both identified users are nearly 5km away from the development, showing potential economic and physical constrains of exporting heat to them. Given the industrial nature of these consumers, it is likely that high grade heat (steam) may be required and the practicality of collecting and returning condensate is unknown.

In addition to this, given that there is no existing heat distribution network in the proximity of the site, additional third / private finance and associated planning permissions would be required to facilitate the construction and operation of the heat network costs. The lack of existing distribution infrastructure and / or the associated permissions / wayleaves to construct the facility creates further tangible barriers to the viability of the export.

3.3 Feasibility of Export to Existing Residential / Domestic Consumers

The facility will have an export capacity of approximately 24 MW for CHP operation. Therefore, it is possible for the development to supply all of the available heat to all of the identified domestic / residential heat consumers within 10km.

However, given the high costs of replacing existing heating systems and the distance from the site creating physical constraints, the supply of all of the identified heat users is not considered a viable option.

3.4 Prospective Developments

A review of potential developments nearby to the site has been carried out and shown in Table 3.3 and Figure 1. A search distance of 10km has been used.

An analysis of the Local Planning Authorities Planning Portal was undertaken as part of this assessment, to identify any prospective developments that would have the potential to be a viable heat consumer. These prospective developments are found in Table 3.4.

An estimate of the potential heat demands from the specific heat user types has been provided through the use of the Chartered Institution of Building Services Engineers (CIBSE) Guide F (Efficiency in

Buildings) has been used. The heat demands for residential developments have been calculated based on a benchmark figure of 65kWh/m^2/year per property and 55kWh/m^2/year per commercial property.

The CIBSE Guide provides good practice benchmark figures based on the energy performance of existing buildings. In the CIBSE Guide, loads are expressed in terms of kWh per square metre of floor space per year of fossil fuel use and for the purpose of this assessment natural gas is typically assumed.

The annual energy demand has been estimated based on an estimate of the floor space of the developments. Converting natural gas use to actual heat loads (which can be provided by a hot water distribution system) requires an assumption of gas-fired boiler efficiency. In this study, an efficiency of 85% is assumed, based on industry norms.

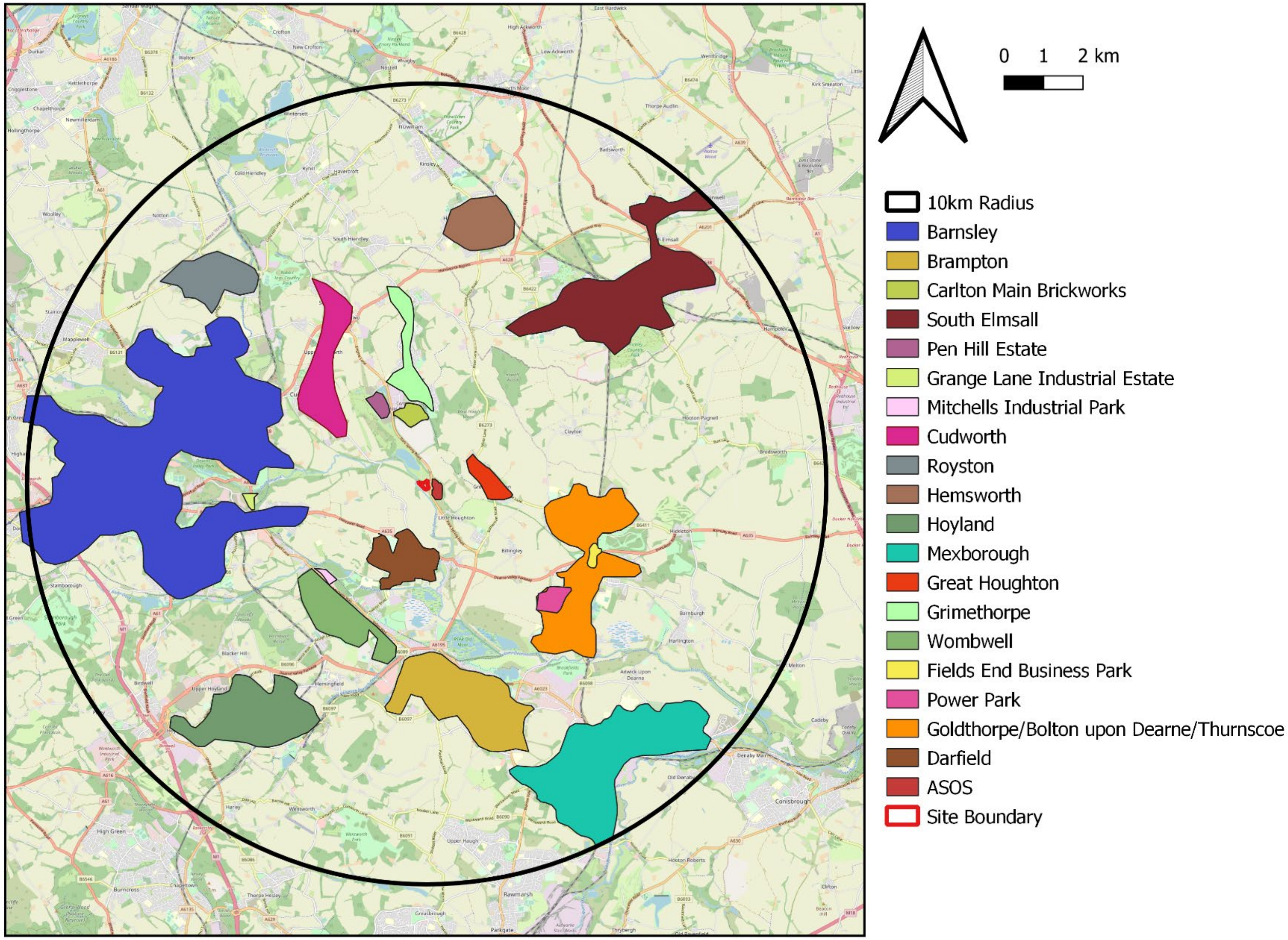

Figure 1 Map of Prospective Developments for the proposed plant over a 10km radius

Table 3.3: Prospective Developments for Potential Heat Export				
Scheme	Development Proposals	Approximate Distance from EfW site	Estimated Heat Demand (MWh/yr)	Estimated Average Heat Demand (MW)
ASOS	A single warehouse development	150m east	3344.82	0.38
Great Houghton	Residential area comprising of approximately 240 dwellings	1.3km east	2301.2	0.26
Brampton	Residential area comprising of approximately 5012 dwellings	4.1km south	29,023.2	2.96
Kirkby	Residential area comprising of approximately 1247 dwellings	4.5km north east	7637.4	0.73
Pen Hill Estate Copy	An industrial estate composing various sized warehouses	2km north west	5,879	0.67
Cudworth	Residential area comprising of approximately 4014 dwellings	2.2km north west	19,599.6	2.21
Grimethorpe	Residential area comprising of approximately 2111 dwellings	1.8km north	10,977.2	1.25
Wombwell	Residential area comprising of approximately 6902 dwellings	3.4km south west	35,545.3	4.05
Goldthorpe / Bolton upon Dearne / Thurnscoe	Residential area comprising of approximately 6,624 dwellings	4.5km south east	28,276.35	3.22
Darfield	Residential area comprising of approximately 4102 dwellings	1.4km south	18,413.87	2.10
Fields End Business Park	An industrial estate composing various sized warehouses	4.5km south east	2603.09	0.29
Power Park	An industrial estate composing various sized warehouses	4.2km south east	2077.32	0.23

Mitchells Industrial Park	An industrial estate composing various sized warehouses	3.3km south west	1382.36	0.15
Grange Land Industrial Estate	An industrial estate composing various sized warehouses	4.5km west	1476.32	0.16
Barnsley	Residential area comprising of approximately 110,590 dwellings	5.8km west	530,832	62.1
Royston	Residential area comprising of approximately 4259 dwellings	6.8km northwest	18,035	2.13
Hoyland	Residential area comprising of approximately 5433 dwellings	6.3km southwest	31,431	3.12
Mexborough	Residential area comprising of approximately 5710 dwellings	7.2km southeast	35,230	3.62
Carlton Main Brickworks	Industrial Brick Manufacturer	1.8km north	4,142	0.92
Hemsworth	Residential area comprising of approximately 645 dwellings	6.6km north	4,361	0.03
Total			**792,568**	**90.58**

Table 3.4: Prospective Developments for Potential Heat Export which are prior to completion

Scheme	Development Proposals	Approximate Distance from EfW site	Estimated Heat Demand (MWh/yr)	Estimated Average Heat Demand (MW)
2022/0908 – Development of Dwellings	Erection of residential development of approximately 250 dwellings	4.5km south	1,325	0.15

3.4 Feasibility of Export

The Site is within a predominantly rural location which increases the potential capital costs of installing and connecting the heat distribution network to potential consumer sites. The closest potential heat user is considered to be the neighbouring ASOS Warehouse. Although the reported heat use for his building is considered to be quite low, the proximity to the site means that it is both technically viable and feasible to directly supply heat via a direct local connection. Given that the exact heat and energy requirements of the ASOS site are not known, it is proposed that further detailed technical feasibility is carried out to fully understand the viability of a direct heat supply connection.

In addition, supplying heat to Carton Brickworks has been investigated but after discussions with the site their heat requirements are too low to be viable as a majority of building and process heat is provided by their existing brick kilns.

One of the primary heat demands of the area is residential areas including Wombwell, Darfield and Grimethorpe, all of which lie within a 5km radius of the proposed development. Given that all housing is 'traditionally' using gas boilers and that no pre-existing heat distribution infrastructure is available within the area, the connection and supply of heat to this development is not considered viable.

An assessment of proposed developments which are still subject to planning approval have been investigated and included within the appraisal. Given that all of these developments are still at the pre-construction phase, the integration with a potential heat network is more feasible. Although there is a proposed development of 250 dwellings within a viable distance from the site, the scale of the heat demand is too small to be considered commercial feasible.

In conclusion, the lack of any high density, commercial or residential heat users, combined with the lack of any local heat distribution networks creates a significant constraint to the commercial viability of heat exportation from the facility.

The nearest viable heat connection is considered to be the neighbouring ASOS facility. This site will be subject to further detailed technical evaluation to fully understand their heat requirement and further detailed feasibility completed.

4. CONCLUSION

An assessment of all potential domestic and commercial heat users within 10km distance from the site has been carried out using The Department for Business, Energy and Industrial Strategy (BEIS) UK CHP Development Map.

This study has concluded that although there are a number of identified large commercial heat consumers within 10km of the development, the nature and profile of the heat use, combined with the lack of existing heat distribution infrastructure means that it not considered viable at this stage. The study also confirms that with the exception of the ASOS warehouse, there are no viable commercial heat users in the immediate vicinity of the plant that can be directly connected to the facility.

Given that the plant has been designed as a CHP facility that is capable of supplying and exporting renewable / low carbon heat, this study will be subject to ongoing review. Any 'new' heat users or distribution infrastructure that is identified or constructed within the vicinity of the plant, will be appraised accordingly.

The commercial viability of a direct heat supply and connection to the ASOS warehouse will be subject to further detailed evaluation and it is proposed that this study be reviewed every 4 years to identify and assess the potential commercial and technical viability for the heat export to the local area.

Due to the lack of any immediately viable heat users, a cost benefit analysis under Article 14 of the Energy Efficiency Directive is not required and has not been considered further.

ANNEX 1 – HEAT AND MASS BALANCE

GRID POWR (UK) Ltd. 34 STATION ROAD POOLE, BH14 8UD UK	Rev.: 0	Investor: GRID POWR (UK) Ltd.	
Designer: I. Vidović		Building: 2 x 25 MWth, 13,6 MWel - EfW Houghton Main	
Designer Co.: A. Plevnik			
Major Designer: V. Plevnik		Content: Houghton Main FLOW DIAGRAM	
Audit: I. Kreča			
Design company: ENERKON 10 000 Zagreb, Croatia			
Project No.: PD-01-22-BD			
Phase: Basic design		Draft No.: PD-01-22-BD-090	Scale: -
Project type: Mechanical engineering project		Sheet: 001/001	Date: October 2022

ANNEX 2 – EA CHP SPREADSHEET

CHP-R Assessment Form			
Number	Description	Units	Notes / Instructions
Requirement 1 – Plant, Plant Location and Potential Heat Loads			
1.1	Plant Name		Houghton Main EfW
1.2	Plant Description		The plant is an EfW type with reciprocating grate and steam boiler. The plant consists of two boiler lines coupled with single turbine with air cooled condenser. Total gross thermal input of the plant is 60 MWth (based on Higher Heating Value -HHV) and 51.68 MWth (Lower Heating Value – LHV). Maximum continuous electrical power rating is 14 MWel. The proposed fuel is refuse derived fuel (RDF). The proposed combustion technology is reciprocating grate close coupled combustion with primary grate gasification and complete combustion in secondary chamber (integrated in boiler first pass). Complete combustion of the fuel on the grate is achieved with high residence time and separate air supply under the end of grate for complete combustion. The plant has two combustion and boiler lines with completely separated flue gas streams. Each line has separate flue gas treatment and continuous emission monitoring system (CEMS). Plant has single stack with separated flues for each line. Whole plant has single turbine and air-cooled condenser (ACC).
1.3	Plant Location		The site is located at Park Spring Road, Houghton Main, Barnsley, S72 7GX. National Grid Reference: SE 41640 06444.
1.4	Factors Influencing Selection of Plant Location		The site is located within a closed colliery without use at the moment. The plant location is in line with relevant Local Plan(s) and the NPPF together with other relevant planning considerations and has valid planning approval. An environmental impact assessment has been carried out and all relevant considerations had been taken into the account.

			The site is in close proximity of suitable connection point to the National Grid Electricity Transmission System, and available capacity for export to the Electricity Transmission System is suitable. Fuel source is in appropriate distance and draft long term fuel contract is in place.
1.5	Operation of Plant		
a)	Proposed Operational Plant Load	%	Plant is designed to operate continuously at 100% MCR. Turbine is designed for continuous operation at 100% TMCR, but with possibility to work at 110% TMCR for shorter periods of time.
b)	Thermal Input at Proposed Operational	MW	The plant thermal input (based on the Lower Heating Value (LHV)) at proposed operational plant load is 51.68 MWth.
c)	Net electrical output at proposed operational plant load	MW	The plant net electrical output at proposed operational plant load is 12.7 MWel.
d)	Net electrical efficiency at proposed operational plant load	%	26.31
e)	Maximum plant load	%	100
f)	Thermal input at maximum plant load	MW	The plant thermal input (based on the LHV) at 100% plant load is 51.68 MWth.
g)	Net electrical output at maximum plant load	MW	The plant net electrical output at 100% plant load 12.7 MWel.
h)	Net electrical efficiency at maximum plant load	%	26.31
i)	Minimum stable plant load	%	70
j)	Thermal input at minimum stable plant load	MW	The plant thermal input (based on the LHV) at minimum stable plant load is 36.1 MWth.
k)	Net electrical output at minimum stable plant load	MW	The plant net electrical output at minimum stable plant load is 8.5 MWel.
l)	Net electrical efficiency at minimum stable plant load	%	23.5%
1.6	Identified Potential Heat Loads		Please refer to main CHP report – no suitable heat load found
1.7	Selected Heat Load(s)		

a)	Category (e.g. industrial / district heating)		Please refer to main CHP report – no suitable heat load found
b)	Maximum heat load extraction required		Please refer to main CHP report – no suitable heat load found
1.8	**Export and Return Requirement of Heat Load**		
a)	Description of heat load extraction		n/a - no suitable heat load found
b)	Description of heat load profile		n/a - no suitable heat load found
c)	Export pressure	bar a	n/a - no suitable heat load found
d)	Export temperature	ºC	n/a - no suitable heat load found
e)	Export flow	t/h	n/a - no suitable heat load found
f)	Return pressure	bar a	n/a - no suitable heat load found
g)	Return temperature	ºC	n/a - no suitable heat load found
h)	Return flow	t/h	n/a - no suitable heat load found
Requirement 2 – Identification of CHP Envelope			
2.1	**Heat extraction at 100% plant load**		
a)	Maximum heat load extraction at 100% plant load	MW	Maximum possible heat load extraction within the technical limitations of the plant at 100% plant load is 24 MW.
b)	Maximum heat extraction export flow at 100% plant load	t/h	Maximum heat extraction export flow at 100% plant load is 30 t/h
c)	CHP mode net electrical output at 100% plant load	MW	CHP net electrical output at 100% plant load 9 MW.
d)	CHP mode net electrical efficiency at 100% plant load	%	CHP net electrical efficiency at 100% plant load based on the LHV is 18%
e)	CHP mode net CHP efficiency at 100% plant load	%	CHP net CHP efficiency at 100% plant load based on the LHV is 63%.
f)	Reduction in primary energy usage for CHP mode at 100% plant load	%	23%
2.2	**Heat extraction at minimum stable plant load**		
a)	Maximum heat load extraction at minimum stable plant load	MW	The maximum possible heat load extraction within the technical limitations of the plant at minimum stable plant load is 13 MWth

b)	Maximum heat extraction export flow at minimum stable plant load	t/h	16 t/h
c)	CHP mode net electrical output at minimum stable plant load	MW	6 MW
d)	CHP mode net electrical efficiency at minimum stable plant load	%	CHP net electrical efficiency at minimum stable plant load based on the LHV is 19 %.
e)	CHP mode net CHP efficiency at minimum stable plant load	%	CHP net CHP efficiency at minimum stable plant load based on the LHV is 55%.
f)	Reduction in primary energy usage for CHP mode at minimum stable plant load	%	19%
2.3	**.Can the plant supply the selected identified potential heat load**		n/a - no suitable heat load found
Requirement 3 – Operation of the Plant with the Selected Identified Heat Load			
3.1	**Proposed operation of plant with CHP**		
a)	CHP mode net electrical output at proposed operational plant load	MW	n/a - no suitable heat load found
b)	CHP mode net electrical efficiency at proposed operational plant load	%	n/a - no suitable heat load found
c)	CHP mode net CHP efficiency at proposed operational plant load	%	n/a - no suitable heat load found
d)	Reduction in net electrical output for CHP mode at proposed operational plant load	MW	n/a - no suitable heat load found
e)	Reduction in net electrical efficiency for CHP mode at proposed operational plant load	%	n/a - no suitable heat load found
f)	Reduction in primary energy usage for CHP mode at proposed operational plant load	%	n/a - no suitable heat load found

g)	Z ratio		n/a - no suitable heat load found
Requirement 4 – Technical Provisions and Space Requirements			
4.1	Description of likely suitable extraction points		The plant has been designed so there are two possible extraction points on the turbine. First (high pressure level) is designed so steam at 13 bar a can be extracted for potential industrial process clients and the second one is low pressure steam extraction for supply of residential and commercial heating application with steam or hot water. Both extractions are terminated at manifold with spare ports with valves and blind flanges so connection can be used without plant shut-down.
4.2	Description of potential options which could be incorporated in the plant, should a CHP opportunity be realised outside the 'CHP envelope'		In the future, if there was the requirement, heat storage can be implemented. When designing connection to the heat distribution system, connections for the heat storage and / or additional heat source (back-up boiler) will be implemented.
4.3	4.3.Description of how the future costs and burdens associated with supplying the identified heat load / potential CHP opportunity have been minimised through the implementation of an appropriate CHP-R design		All considerations for future heat supply have been carried out and maximal technical heat supply potential had been implemented.
4.4	Provision of site layout of the plant, indicating available space which could be made available for CHP-R		During the design of the plant, spare space has been identified if needed for additional water treatment equipment. Design of the water storage provisioned additional connection points for future potential sources. The control system had been designed so implementation will be simple. On the site, there is sufficient space for placing of additional back-up boiler and heat storage if it becomes a necessity.
Requirement 5 – Integration of CHP and Carbon Capture			
5.1	Is the plant required to be CCR?		No

5.2	**Export and return requirements identified for carbon capture**		
a)	Heat load extraction for carbon capture at 100% plant load	MW	n/a
b)	Description of heat export (e.g. steam / hot water)		n/a
c)	Export pressure	bar a	n/a
d)	Export temperature	°C	n/a
e)	Export flow	t/h	n/a
f)	Return pressure	bar a	n/a
g)	Return temperature	°C	n/a
h)	Return flow	t/h	n/a
i)	Likely suitable extraction points		n/a
Minimum Stable Plant Load			
j)	Heat load extraction for carbon capture at minimum stable plant load	MW	n/a
k)	Description of heat export (e.g. steam / hot water)		n/a
l)	Export pressure	bar a	n/a
m)	Export temperature	°C	n/a
n)	Export flow	t/h	n/a
o)	Return pressure	bar a	n/a
p)	Return temperature	°C	n/a
q)	Return flow	t/h	n/a
r)	Likely suitable extraction points		n/a
5.3	**Operation of plant with carbon capture (without CHP)**		
a)	Maximum plant load with carbon capture	%	n/a
b)	Carbon capture mode thermal input at maximum plant load	MW	n/a
c)	Carbon capture mode net electrical output at maximum plant load	MW	n/a
d)	Carbon capture mode net electrical efficiency at maximum plant load	%	n/a

e)	Minimum stable plant load with CCS	%	n/a
f)	Carbon capture mode CCS thermal input at minimum stable plant load	MW	n/a
g)	Carbon capture mode net electrical output at minimum stable plant load	MW	n/a
h)	Carbon capture mode net electrical efficiency at minimum stable plant load	%	n/a
5.4	**Heat extraction for CHP at 100% plant load with carbon capture**		n/a
a)	Maximum heat load extraction at 100% plant load with carbon capture	MW	n/a
b)	Maximum heat extraction export flow at 100% plant load with carbon capture	t/h	n/a
c)	Carbon capture and CHP mode net electrical output at 100% plant load	MW	n/a
d)	Carbon capture and CHP mode net electrical efficiency at 100% plant load	%	n/a
e)	Carbon capture and CHP mode net CHP efficiency at 100% plant load	%	n/a
f)	Reduction in primary energy usage for carbon capture and CHP mode at 100% plant load	%	n/a
5.5	**Heat extraction at minimum stable plant load with carbon capture**		
a)	Maximum heat load extraction at minimum stable plant load with carbon capture	MW	n/a

b)	Maximum heat extraction export flow at minimum stable plant load with carbon capture	t/h	n/a
c)	Carbon capture and CHP mode net electrical output at minimum stable plant load	MW	n/a
d)	Carbon capture and CHP mode net electrical efficiency at minimum stable plant load	%	n/a
e)	Carbon capture and CHP mode net CHP efficiency at minimum stable plant load	%	n/a
f)	reduction in primary energy usage for carbon capture and CHP mode at minimum stable plant load	%	n/a
5.6	**Can the plant with carbon capture supply the selected identified potential heat load (i.e. is the identified potential heat load within the 'CHP and carbon capture envelope')?**		n/a
5.7	**Description of potential options which could be incorporated in the plant for useful integration of any realised CHP system and carbon capture system**		n/a
Requirement 6 – Economics of CHP-R			
6.1	**Economic assessment of CHP-R**		It has not been possible to assess the economic feasibility of a CHP scheme as no suitable heat users have been identified and the infrastructure required remains unknown.
BAT Assessment			
	Is the new plant a CHP plant at the outset (i.e. are there economically viable CHP opportunities at the outset)?		No
	If not, is the new plant a CHP-R plant at the outset?		Yes

	Once the new plant is CHP-R, is it BAT?		Yes