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Medway Energy Recovery Limited

Non-Technical Summary

Document approval

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1 Introduction

Medway Energy Recovery Limited is applying to the Environment Agency (EA) under the Environmental Permitting Regulations (EPR's) for an Environmental Permit (EP) to operate the MedwayOne Energy Hub (the Facility).

The Facility will comprise a twin line waste incineration plant (the Facility) and associated infrastructure (including battery storage), and will be located at MedwayOne¹, Kent. For the purposes of this application, Medway Energy Recovery Limited is applying for an EP for the Facility.

1.1 The Applicant

Medway Energy Recovery Limited (company number: 12790514) has a registered address of Stirling Square, 5-7 Carlton Gardens, London, SW1Y 5AD, and is an SPV of Low Carbon.

Low Carbon is a renewable energy developer of and investor in large scale renewable energy projects, including solar, onshore wind, offshore wind, energy-from-waste (EfW) and battery storage. Low Carbon has an EfW portfolio consisting of a number of UK assets at varying stages of development, including the Redcar Energy Centre (REC) – the EP application for the REC is currently being determined by the EA. Low Carbon has also developed the ERF at Irvine under the 'Doveryard' company name, which is currently going through the PPC Permit determination process with SEPA. Low Carbon enables the deployment of capital at scale into renewables, investing across the full life cycle from concept, through to development, construction and operation.

1.2 The Site

The Site is located within the wider MedwayOne development which is being developed on the site for the former Kingsnorth Power Station. Access to the Site is via Eschol Road to the west.

The Site is located on the Hoo Peninsula in Medway, Kent, immediately south of the Damhead Creek CCGT power station. The Site is located approximately 4 km east of Hoo St Werburgh, and approximately 15km northeast of Chatham.

The Damhead Creek Gas-fired Power Station is located to the north of the site, with the Kingsnorth industrial estate lying to the northeast of the site. Damhead Creek runs to the east of the Site and connects with the estuary for the River Medway.

The MedwayOne site is a mix of brownfield and greenfield land on which the former Kingsnorth coal-fired power station was located prior to demolition, and has a varied topography. The plot which the Facility is being developed on has been subject to very limited development and was farmland prior to it being developed as a sports field for the former Kingsnorth Power Station.

1.3 The Activities

The Facility will consist of a combination of a Schedule 1 installation activity (as defined in the Environmental Permitting Regulations) (EPR) and other directly associated activities. The site consists of an Energy Hub comprising two incineration lines to recover energy from waste, enabling:

1. generation of power for export to the National Grid and the potential to export heat;

¹ The former Kingsnorth Power Station site.

2. production of an inert bottom ash material that will be transferred off-site to an IBA processing facility; and
3. generation of an air pollution control residue that will be transferred off-site to a suitably licensed hazardous waste facility for disposal or recovery.

It is also proposed for a battery energy storage system (BESS) to be installed at the site, although it is acknowledged that this is not a regulated activity under the EPR. The BESS is expected to have a peak discharge capacity of 10 MWe and a storage duration of 2 hours, resulting in a total capacity of 20 MWhe.

The Schedule 1 activities (as defined in the Environmental Permitting Regulations), and the Directly Associated Activities (DAA's) which will be undertaken at the Facility are listed in Table 1.

Table 1: Scheduled and directly associated activities

Type of Activity	Schedule 1 Activity	Description of Activity	Limits of specified activity
Installation	Section 5.1 Part A(1) (b)	The incineration of non-hazardous waste in a two stream waste incineration plant with a capacity of 3 tonnes per hour or more	From receipt of waste to treatment and emission of exhaust gas and disposal of any residues arising and processing of incinerator bottom ash. Waste types for the Facility as specified in the Supporting Information.
Directly associated activities			
Directly associated activities		Energy generation	Generation of up to 49.9 of electrical power using a steam turbine, with electricity exported to the National Grid, and the potential to export heat to local heat users from energy recovered from the flue gases
Directly associated activities		Back-up diesel generator	For providing emergency electrical power to the plant in the event of supply interruption. Operation for no more than 50 hours per year for testing purposes (unless in emergency situations).
Directly associated activities		Surface water management	From collection of uncontaminated surface water drainage for discharge to the MedwayOne drainage system.

2 Details of the Energy Hub

2.1 The Energy Hub

The Facility will incinerate refuse-derived fuel (RDF), sourced primarily from commercial waste contracts.

The Facility will have a thermal capacity of 166 MWth (83 MWth per incineration line). The design fuel will have a net calorific value (NCV) of 10.5 MJ/kg, but the Facility will be designed to process waste with a range of NCVs between 8 – 14 MJ/kg without reducing load. At the design point, the Facility will have an hourly waste processing throughput of 28.5 tonnes per hour (tph) per line. Assuming an operational availability of 8,000 hours per annum, the Facility will process 456,000 tonnes per annum of waste.

However, the Facility will be capable of processing waste with an NCV of 8 MJ/kg without reducing load. Assuming an availability of 8,000 hours, the Facility can process up to 606,000 tpa of waste.

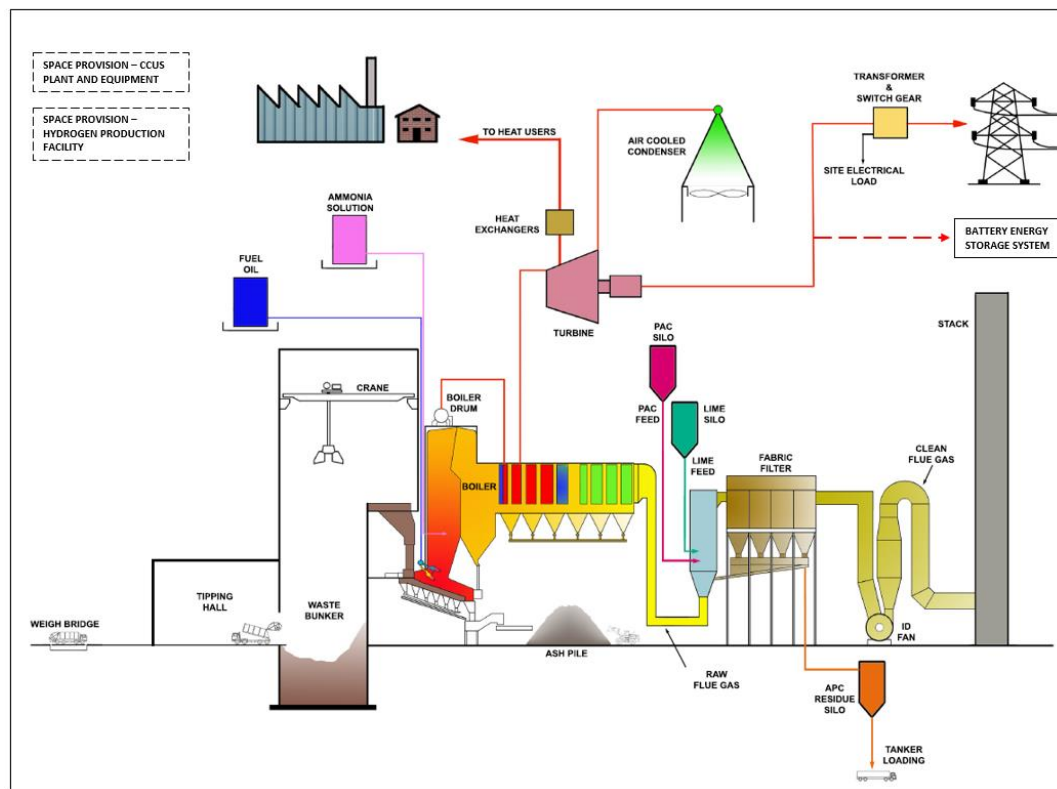
The Facility will generate up to 49.9 MWe of electricity with a parasitic load of approximately 5 MWe. Therefore, the Facility will be designed to export up to 44.9 MWe of electricity.

The electrical connection is to be at the UKPN substation, situated within the wider MedwayOne development. In addition, the Facility will be designed to allow for private wire connections for the export of power to energy users within the MedwayOne development.

The Facility will be designed as carbon-capture ready and combined heat and power (CHP) ready with provision of space for future installation of CCUS and/or CHP equipment if required.

An indicative process diagram for the incineration process is presented in Figure 1.

Figure 1: Indicative Process Schematic



2.2 Raw materials and feedstocks

The primary 'raw material' to be stored at the MRF will be non-hazardous waste. Small quantities of maintenance materials will also be kept at the MRF (oils, greases, insulants, antifreezes, welding and firefighting gases etc) for the operation and maintenance of plant and equipment on site.

The Facility will utilise a number of different chemicals and raw materials within the different power plant processes. The chemicals and raw materials used at the site will include, but not be limited to, the following:

- hydrated lime (CaOH₂);
- activated carbon;
- ammonia (or urea) solution;
- mains water;
- non-hazardous mixed waste;
- auxiliary fuel; and
- water treatment chemicals.

Raw materials (including maintenance materials) will be supplied to standard specifications offered by different suppliers. All chemicals will be handled in accordance with COSHH Regulations as part of the quality assurance procedures and full product data sheets will be available.

Periodic reviews of all materials used will be made in the light of new products and developments. Any significant change of material, where it may have an impact on the environment, will not be made without firstly assessing the impact and seeking approval from the Environment Agency (EA).

The Operator will maintain a detailed inventory of raw materials used and will have procedures for the regular review of developments in raw materials used.

2.3 Emissions

2.3.1 Emissions to air

Emissions from the Facility will be released from a single 85m tall stack, containing two separate flues.

Detailed air dispersion modelling of emissions has been undertaken to assess the environmental impact associated with the emissions released to air. This has demonstrated that the emission to air will not have a significant impact on human or ecological receptors.

2.3.2 Emissions to water and sewer

There will not be any discharges of process effluent to surface water or groundwater from the Facility. During normal operation the Facility will not give rise to process effluents and will be classified as a 'zero discharge' process.

During periods of extended shutdown, there may be a need to discharge excess effluents (e.g. following draining of the boiler). As the MedwayOne development does not have a foul sewerage system, the excess process effluents may be tankered off-site. In the event that a foul sewer is installed at the MedwayOne development, LCW2E2 will look to make a connection to the foul sewer to enable the excess process effluents to be discharged to sewer in accordance with a Trade Effluent Discharge Consent.

Surface water run-off from building roofs and areas of hardstanding will be collected in an on-site surface water drainage system and collected in an attenuation pond, prior to discharge into the existing surface water drainage system for the Kingsnorth Power Station which outfalls to the River Medway, herein referred to as the MedwayOne drainage system.

2.4 Monitoring

There will be continuous monitoring of emissions to air of the flue gases from the Facility. The monitoring system will include monitoring of oxygen, carbon monoxide, hydrogen chloride, sulphur dioxide, nitrogen oxides, ammonia, VOCs, and particulates.

Other pollutants will be monitored by spot measurements at regular intervals. All continuous emissions measurements will be recorded, and operators will be alerted if emissions to air approach the permitted limits. The results of emissions monitoring will be reported to the EA.

The Facility will utilise modern control systems, which incorporate the latest advances in control and instrumentation technology. These systems will optimise the operation of the Facility.

2.5 Technology selection

The processes have been designed against the background of a detailed assessment of the prevailing environmental conditions at the site location, in order that the objectives of the Industrial Emissions Directive (IED) are met. Best Available Techniques will be employed at REC to minimize its impact upon the local environment.

A qualitative BAT review has been completed for the IBA facility which has demonstrated that dry treatment of IBA represents BAT for the IBA facility.

A quantitative BAT assessment has been completed for the Facility. This has demonstrated that the proposed techniques to be employed at the Facility will represent BAT in accordance with the relevant BAT guidance notes.

The following techniques are proposed to be employed at the Facility:

- SNCR with ammonia solution for the abatement of oxides of nitrogen;
- a moving grate for the combustion of waste;
- a dry system for the abatement of acid gases; and
- lime to be used as a reagent for the abatement of acid gases.

2.6 Residues

The main solid residue streams arising from the Facility are:

1. Incinerator Bottom Ash (IBA); and
2. Air Pollution Control residues (APCr).

It is intended that the IBA from the Facility will be transferred to the adjacent IBA processing facility.

APCr is classified as hazardous and requires specialist disposal or treatment. It may be possible to send the residue to a waste treatment contractor, to be used to neutralise acids and similar materials. Using the residues in this way avoids the use of primary materials. If these options are not available, the APCr will be sent to a suitably licensed hazardous waste landfill for disposal as a hazardous waste.

2.7 Management

To ensure effective management of Facility, LCW2E2 will develop a documented management system that clearly defines the management structure for the Facility, as well as setting out the roles and responsibilities of all staff.

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