Annual performance report for: Templeborough Biomass Power Plant Limited

Templeborough Biomass Power Plant

Permit Number: EPR/NP3805BY

Year: 2022

This report is required under the Industrial Emissions Directive's Article 55(2) requirements on reporting and public information on waste incineration plants and co-incineration plants, which require the operator to produce an annual report on the functioning and monitoring of the plant and make it available to the public.

1. Introduction

Name and address of plant	Templeborough Biomass Power Plant River View Sheffield Road Rotherham S60 1FA
Description of waste input	Waste wood
Operator contact details if members of the public have any questions	Babcock & Wilcox Vølund Ltd. Templeboroughbiomassplant@Volund.dk

2. Plant description

The facility is an installation, whose main purpose is the generation of energy using waste as a fuel in a waste co-incineration plant. The relevant listed activity is Section 5.1 A (1) (b): The incineration of non-hazardous waste in a waste co-incineration plant with a capacity exceeding 3 tonnes per hour. The permit implements the requirements of the EU Directive on Industrial Emissions (IED). The main features of the Installation are as follows: The Templeborough Biomass Power Plant consists of a biomass-fuelled electricity generating station located within the Firth Rixson site on Sheffield Road, Templeborough, near Rotherham. The installation is located in a predominantly industrial area, the nearest residential properties are approximately 600 metres to the North, with Rotherham town centre approximately 1.5 km to the East. The facility consists of a single solid biomass plant which will burn waste to produce steam. The waste consists of recycled waste wood. In total, the Plant is designed to burn up to 270,000 tonnes of waste per annum, with a maximum of 320,000 tones, depending on the operating hours and the calorific value of the waste. The steam produced is used to generate about 41.45MWe. The majority of the electricity generated is exported to the National Grid with the remained used to power the Plant. The following operations are included within the scope of the Plant:

- *Combustion of fuel in a combined heat and power-ready (CHP-R) plant*
- *Reception, transfer and storage of wood*
- *Steam turbine operation and the generation and export of electrical energy*

- *Cooling and condensing of the exhaust steam in water cooled condensers*
- *Storage, pH control and discharge of process effluent*
- *Storage and handling of process residues extracted from biomass fuel streams.*

The main pollutants from the co-incinerator will be gaseous combustion products. Emissions from the co-incinerator are controlled to IED Chapter IV standards. Combustion gases are cleaned before they are emitted via a 60 metre high stack. The abatement techniques used for cleaning of the gases are:

- *Selective Non-Catalytic Reduction (SNCR) where ammonia is injected into the gas stream to reduce oxides of nitrogen release*
- *Lime injection to neutralise acid gases*
- *Activated carbon injection to remove heavy metals, dioxins and furans*
- *Fabric filters to remove particulates.*

Emissions from the stack are monitored in accordance with permit requirements and for process control purposes. Main waste streams include the boiler and cooling tower blow down to sewer and ash residues from the boiler and flue gas cleaning. Ash is subject to testing to determine physical and chemical properties and pollution potential prior to determining the appropriate use. All wastes will be managed in a way which prevents their accidental release and enable recycling as much as practicable.

3. Summary of Plant Operation

Waste wood (biomass) received	251,678 tonnes
Total plant operational hours	7,549 hours
Total hours of “abnormal operation” (see permit for definition)	None
Total quantity of incinerator bottom ash (IBA) produced	19,928 tonnes
Disposal or recovery route for IBA	Deposit into or onto land
Did any batches of IBA test as hazardous? If yes, state quantity	Hazardous assessment of IBA not yet started
Total quantity of air pollution control (APC) residues produced	6,486 tonnes
Disposal or recovery route for APC residues	D09 – Physico-chemical treatment
Total electricity generated for export to the National Grid	254,889 MWh

4. Summary of Plant Emissions

4.1 Summary of continuous emissions monitoring results for emissions to air

The attached charts show the performance of the plant against its emission limit values (ELVs) for substances that are continuously monitored. These are listed below:

Carbon Monoxide

Hydrogen chloride

Sulphur dioxide

Oxides of nitrogen

Total organic carbon

Particulates

4.2 Summary of periodic monitoring results for emissions to air

The table below shows the results of periodically monitored substances.

Substance	Emission limit value	Results			
		08/02/21 – 11/02/21	13/09/21 – 16/09/21	08/02/22 – 10/02/22	22/11/22 – 24/11/22
Mercury and its compounds	0.05 mg/m^3	<0.0004 mg/m^3	<0.0004 mg/m^3	<0.0007 mg/m^3	<0.0002 mg/m^3
Cadmium & thallium and their compounds (total)	0.05 mg/m^3	0.0009 mg/m^3	<0.0008 mg/m^3	0.0008 mg/m^3	<0.001 mg/m^3
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m^3	0.028 mg/m^3	0.108 mg/m^3	0.005 mg/m^3	0.001 mg/m^3
Dioxins and furans (I-TEQ)	0.1 ng/m^3	0.0039 ng/m^3	0.0010 ng/m^3	0.00089 ng/m^3	0.003 ng/m^3
Hydrogen Fluoride	2 mg/m^3	<0.04 mg/m^3	<0.034 mg/m^3	<0.08 mg/m^3	<0.08 mg/m^3

5. Summary of Permit Compliance

5.1 Compliance with permit limits for continuously monitored pollutants

The plant met its emission limits as shown in the table below.

Substance	Percentage time compliant during operation
	Daily limit
Particulates	100 %
Oxides of nitrogen	100 %
Sulphur dioxide	99.85%
Carbon monoxide	99.98%
Total organic carbon	100%
Hydrogen chloride	100 %

5.2 Summary of any notifications or non-compliances under the permit

Date	Summary of notification or non-compliance	Reason	Measures taken to prevent reoccurrence
06-06-2022	Notification of daily SO2 ELV exceedance	Contaminated Fuel Stocks of wood.	Deliveries stopped from source and further Duty of Care Audit carried out.
01-12-2022	Notification of daily SO2 ELV exceedance	Pallet became trapped in the Fuel delivery conveyor which prevented the process being loaded. The burners kicked in prior to T2S set point of 850degC but was not enough to prevent a breach. T2S Burner set points to be raised	The T2S set point (i.e., burner cut in temperature) has been increased from 900degC > 925degC. This will allow the burners to cut in earlier and help maintain complete combustion within the furnace in the event of a loss of T2S temperature. Slow down the Grate movement in the combustion zone to reduce the amount of unburnt primary air entering the gaseous stream.

5.3 Summary of any complaints received and actions to taken to resolve them.

Date of complaint	Summary of complaint	Reason for complaint including whether substantiated by the operator or the EA	If substantiated, measures to prevent reoccurrence
None			

6. Summary of plant improvements

Summary of any permit improvement conditions that have been completed within the year.

None
Summary of any changes to the plant or operating techniques which required a variation to the permit and a summary of the resulting environmental impact.
None
Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.
None.

End of Report