

Permit Number: EPR/KP3033VY Operator: Welsh Water Organic Energy (Cardiff) Ltd  
 Facility: Tremorfa Anaerobic Digestion Facility Form Number: Performance1 – 01/01/20

**Reporting of other performance indicators for the period 01/01/2019 to 31/12/2019**

Parameter	Units
Power Output – Electricity	MWh 10297.6
Energy Efficiency	MWh/m <sup>3</sup> Biogas Electricity generated / Total fuel input = 10,297 / 26662 = <b>38.6%</b>
Electrical Energy – Exported to the grid	MWh 8872.1
Electrical Energy – Drawn from the grid	MWh 171.7
Operational running time of the flare	Hours 235/ 2.7%
Amount of biogas combusted in the CHP unit per day	m <sup>3</sup> /day 12175 (daily average through the CHP engine)
Biogas generated	4,654,869 m <sup>3</sup>
Total waste treated	23810.29 Tonnes
Solid digestate	366.90 Tonnes
Liquid digestate	26,438.21 Tonnes

Operator's comments : Eney Efficiency calculated as follows –  
 Electricity generated: 10,297 MWh  
 Total biogas/fuel input: 4,654,869 m<sup>3</sup>  
 Average CH<sub>4</sub> percentage in biogas: as measured by online sensor 54.55%  
 CH<sub>4</sub> energy yield kWh/m<sup>3</sup> = 10.5 kWh/m<sup>3</sup> (Common standard)  
 Total biogas/fuel input; 4,654,869 x 0.5455 x 10.5 = 26661925.9 kWh = 26,662 MWh  
**Energy efficiency** = Electricity generated / Total fuel input = 10,297 / 26662 = **38.6%**

Signed .....Mark Esposito.....  
 (Authorised to sign as representative of Operator)

Date.....20/07/20.....



Permit Number: EPR/KP3033VY Operator: Welsh Water Organic Energy (Cardiff) Ltd

Facility: Tremorfa Anaerobic Digestion Facility Form Number: Air1 – 01/01/20

Reporting of emissions to air for the period from 01/01/2019 to 31/12/2019

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result <sup>[1]</sup>	Test Method <sup>[2]</sup>	Sample Date and Times <sup>[3]</sup>	Uncertainty <sup>[4]</sup>
A2	Oxides of Nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )	500 mg/m <sup>3</sup>	Hourly average	468.64 mg/m <sup>3</sup>	BS EN 14792	05/11/2019 12:40 – 13:40	2%
A2	Carbon Monoxide	1400 mg/m <sup>3</sup>	Hourly average	716.69 mg/m <sup>3</sup>	BS EN 15058	05/11/2019 12:40 – 13:40	2%
A2	Sulphur Dioxide	350 mg/m <sup>3</sup>	Hourly average	3.72 mg/m <sup>3</sup>	BS EN 14791	05/11/2019 12:40 – 13:40	13%
A2	Particulate matter <sub>10</sub>	No limit set	Hourly average	0.80 mg/m <sup>3</sup>	BS EN 14792	05/11/2019 12:40 – 13:40	3%
A2	Total VOC's	1000 mg/m <sup>3</sup>	Hourly average	716.69 mgC/m <sup>3</sup>	BS EN 12619	05/11/2019 12:40 – 13:40	3%
A5	Oxides of Nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )	150mg/m <sup>3</sup>	Hourly average	- mg/m <sup>3</sup>	BS EN 14792	21/03/2019 12:49 – 13:59	2%
A5	Carbon Monoxide	50mg/m <sup>3</sup>	Hourly average	- mg/m <sup>3</sup>	BS EN 15058	21/03/2019 12:53 – 13:53	3%
A5	Total VOC's	10mg/m <sup>3</sup>	Hourly average	- mgC/m <sup>3</sup>	BS EN 12619	21/03/2019 12:53 – 13:53	2%

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Environment Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.

[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.

[4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Operator's comments

The Cardiff Organic Energy Plant had a better year in 2019. After improving the operational performance of the site, the waste gas burner only run for 235 hours, which is less than 10% of the time and therefore there is no need to measure the emissions coming out of the flare stack. In addition to the operational improvements, it has been planned to install a new boiler on site in March 2020. This will improve the resilience of the site and will decrease even more the operational times of the waste gas burner.

Signed ..... Mark Esposito.....  
(Authorised to sign as representative of Operator)

Date 20/07/2020