

Combined heat and power (CHP) engine details

	Clarke Jenbacher	Edina
Model	312	MWM 2016 v12
Installation date	December 2015	December 2015
First use date	January 2016	February 2016
Electrical output	500 – 637 kWe	600 kWe

The facility has planning permission to construct two semi-plug flow primary digesters, two secondary digesters and two CHP engines together with the associated infrastructure. Bryn Power opted to construct the site in two phases each consisting of one semi-plug flow primary digester, one secondary digester and one CHP engine to process the biogas produced in each pair of digesters. The second phase will be constructed if contracts for additional food waste are secured and a variation to the environmental permit will sought accordingly.

Late in the construction process for the first phase and after the initial environmental permit application was submitted Bryn Power opted to install the second CHP engine. It was anticipated that the second engine would only be used when the second phase of the AD facility was constructed or as an emergency back-up during periods of maintenance on the first engine.

Due to the efficiency of the semi-plug flow digester and the type of feedstocks treated at the site, more biogas is produced than can be processed by one CHP engine, as such, the additional CHP has been utilised by at the facility.

Emission limit values (ELV) for each of the two CHP engines		
	Existing	Proposed
Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	500 mg/m ³	500 mg/m ³
Carbon Monoxide	1400 mg/m ³	1400 mg/m ³
Sulphur Dioxide	350 mg/m ³	350 mg/m ³
Total Volatile Organic Compounds VOCs	1000 mg/m ³	2000 mg/m ³

The emission limits set in the existing environmental permit application were based on the AD facility technology providers typical manufacturing data. Experience has shown that emissions from the AD vary depending on many operational factors, such as, the type of feedstocks being processed, the efficiency of the CHPs etc. Routine monitoring of the emissions from the CHPs indicate that there are times when the site is operating beyond the currently permitted ELVs.

An Air Quality Assessment has been prepared by Environmental Visage to provide details of the likely impact on local air quality from both CHP engines at the proposed ELVs. The assessment concludes that the current discharges from the two engines are too low and that the stack height from the two engines should be increased to 10m above ground level in order to ensure effective dispersion from the facility. Detailed dispersion modelling demonstrated that, when discharging through 10 m stacks and applying the accepted methodology for screening insignificant impacts, most pollutants could be screened as insignificant at either the primary or secondary stage. An exception to this is seen in the consideration of contributions of VOCs when considered against the Air Quality Standard for Benzene. However, where Benzene is considered to constitute 5 % of the total VOC emission, a level which is considered to represent an appropriate upper level for such facilities, it too can be screened as insignificant.

Bryn Power are seeking to increase the emission limits in order for the ELVs in the permit to reflect the current operating parameters and to take into account any normal operational fluctuations.