TECHNICAL INFORMATION

ORBITAL
GAS SYSTEMS

BIOMETHANE TO GRID

Orbital's Biomethane Background

By further processing biogas into biomethane, which can be injected into the already existing gas grid, we can improve our fight against climate change by reducing highly polluting methane emissions and displacing fossil fuels with a low-carbon, renewable source. Additionally, we can not only promote production of renewable natural gas from landfills, wastewater treatment plants, food processing and agriculture, but also help create jobs and promote rural economic development.

SOME NOTABLE FEATURES

- Pre engineered modules so the customer can select only features they require
- Simple Flange to Flange Solution – Only 3 connections: inlet from biogas cleanup plant; outlet to grid; reject to recirculation/flare
- Fiscal Metering and Calorific Value/BTU measurement
- Gas Quality Analysis, Compliant with regulatory standards
- Odorization
- Pressure Reduction or Compression and Control
- Flare / Reject Gas System
- Propane Vaporization, Injection and Control
- Remotely Operated Valve (ROV)
- Equipment Room – Hazardous Area Compliant
- Control Room – Safe Area including Flow Computer, Target CV Control, Telemetry etc.

Biomethane to Grid

ABOUT OUR NETWORK ENTRY UNITS

The use of renewable biomethane in the global fuel mix provides a level of security as it is produced locally, under controlled conditions and production is sourced from a feedstock that will always be plentiful and available. This means that the production gives a high level of assurance with no risk of international politics or fluctuating financial markets affecting supply.

Currently, most biogas is used to generate electricity through combined heat and power plants. However, converting biogas into biomethane is much more flexible and efficient than using Biogas to directly produce electricity, better for the environment, as much more energy is retained through grid injection and the escape of harmful methane into the atmosphere (which happens during combustion for electricity generation) is avoided. The production process for biomethane is a green technology that has a small carbon footprint, as it makes efficient use of existing 'waste' material.

This clean, sustainable fuel can be transported to homes and businesses using the existing gas distribution network, avoiding the costs of widespread infrastructure upgrades. Retaining gas as part of our energy mix, rather than complete dependence on electricity, will also avoid the need for unsustainable upgrades to electricity distribution networks.

One of the challenges to utilizing Biogas (and Biomethane) cost effectively has been the control of the product quality as it enters the gas grid.
For over 20 years Orbital designed and delivered solutions for Above Ground Installations, Gas Terminals and other Network Entry Points throughout the UK, Europe and the US. These solutions lead Orbital to the concept of the NEU, bringing together our integration expertise into a single building, assembled and tested offsite to fully control, monitor, measure and modify the biomethane to meet grid specifications ensuring the customer receives maximum commercial benefit with minimum time and expense upfront.

BIOMETHANE TO GRID

ABOUT OUR NETWORK ENTRY UNITS

Orbital delivered the first two operational installations in the UK: The first system ever was at Didcot WwTW (2010), which was regarded as a development engineering stepping stone; the second being the UK's 1st commercial scale engineered NEU (competitively engineered solution) at Poundbury (Rainbarrow Farm, 2012). Both biogas plants used different types of clean up technology, Water Wash and Membrane respectively and our NEU have remained fully flexible to work with any clean-up plant technology. Since those early days we have gone on to successfully design, install and commission more than 30 systems.

The overall solution we adopted was to pre-engineer simple modules to allow the customer to have the exact solution they require, without the engineering cost and delivery timescale of a fully custom solution. This gives us the ability to maximise financial returns with very minimal delivery time.

Making Economic Sense Out of RNG by Reducing Costs with GasPT

In addition to developing our NEU, Orbital are at the forefront of innovation and are striving to reduce costs (CAPEX and OPEX), improve efficiency and reduce delivery times. One prime example of this would be the creation of the GasPT inferential analyzer. With the GasPT you get rapid and accurate monitoring of gas quality and is ideally suited to biomethane applications. GasPT will respond to BTU changes in less than 10 seconds at an accuracy error $<\pm 0.5\%$ and it can also provide Motor Octane Number or Methane Number if needed for gas engine control. The GasPT instrument allows near real-time analysis and, unlike traditional gas chromatographs, requires no calibration, carrier gas, practically zero maintenance and ensures that out of specification gas is diverted within seconds.