Biomethane Gas Monitoring Systems
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With dwindling gas supplies in the North Sea and a subsequently ever increasing dependency on imported gas supplies, the threat to a stable and economically viable gas supply for UK households and industry has never been greater. In addition, there are a host of environmental issues to be considered born from our dependency on non-renewable energy sources: it is governmental policy to increase renewable energy sources from 1.8% to 15% by the year 2020.

One method of reducing our dependency on natural gas sourced from gas fields is to generate methane gas from renewable carbon sources, generically referred to as bio methane production processes, then to inject this gas into our existing gas network (along with the natural gas obtained from gas fields and imported LNG). There are currently a number of such processes under large scale trial. One of which is the generation of bio methane from anaerobic digestion of biodegradable waste. This method currently of significant interest.

Anaerobic digestion is the process in which microorganisms break down biodegradable material, such as sewage and foodstuffs, in the absence of oxygen to produce methane rich biogas. The biogas produced has a very different chemical mix than natural gas obtained from natural gas fields, impurities must be removed and the wobbe value adjusted (as necessary) to satisfy compliance with the ‘Gas Safety (Management) Regulations (GSMR)1996’ which regulates the quality of gas entering our gas network.

Orbital has been involved with gas quality measurement, fiscal metering and odorisation of natural gas streams for many years, all of which are vital and necessary processes to allow biogas to be utilised in the same manner as currently available natural gas streams.
Orbital have recently (September 2010) installed a bio methane monitoring and treatment plant on the UK’s very first large scale bio methane production gas facility. Designed specifically for generating bio methane for injection into the existing gas network. The facility at Didcot, Oxfordshire, generates bio methane by the anaerobic digestion of waste from the on site sewage plant.

Orbital’s bio methane monitoring and treatment system, installed as part of the overall installation, incorporates fiscal flow metering to facilitate custody transfer of the biogas into the natural gas distribution network. In addition, the plant includes the facility to enrich the gas with propane if necessary, then to measure the quality of the gas to ensure compliance with the ‘Gas Safety (Management) Regulations 1996’. These regulations require that various parameters of the gas are measured including sulphurs, water, hydrocarbon dewpoint, wobbe index and a number of other parameters.

Furthermore, the regulations demand that the biogas is treated with odorant: our system incorporates gas treatment capability to allow odorant to be injected into the biogas stream.

“In 2010 Orbital installed the UK’s very first large scale bio methane production gas facility”
“With the UK’s renewable energy targets for 2020 Biomethane is expected to play a key role in reaching those goals. In the UK there are only three Biomethane to Grid (BtG) sites. Orbital designed and supplied bespoke systems for each of those three sites. We have been working closely with other organizations to try and reduce the cost of the systems required to export gas to the grid.”

For this application Orbital provides a standalone housing (kiosk) called BtG (Biomethane to Grid) which contains:

- Supply of metering system for Biomethane.
- Supply of analytical system for Biomethane.
- Supply of telemetry system for Biomethane.
- Supply of odourant injection system for Biomethane.
- Supply of pressure reduction unit.
- Supply of control racks for Biomethane.
- Supply of all civil works.
- Standard Factory Acceptance Test (FAT).
- Standard Site Acceptance Test (SAT).
- Site installation and commission, this includes labour, accommodation and travel.
- Project management, organisation, requirements and meetings for grid connection and turn on.
- Approval, appraisal for all design disciplines.
- Validation of metering system.

To sum up Orbital can provide a full system from gas analysis to data configuration, export to the RTU system and finally communication with the Natural Gas Grid DCS system. Orbital have had a long and strong working relationship with the UK’s utility companies and have turned many suppliers on to the grid. We can contribute to meetings ensuring all requirements are met for a supplier to export on to the National Gas Network. If you want more information about our systems please don’t hesitate to contact us.
"We consider ourselves to be the largest system integrator within the UK utilities market and pride ourselves on our ability to deliver all our projects on time within budget and with unrivalled build quality whilst ensuring we operate in a safe and environmentally conscious way."

**Orbital** is a specialist gas engineering company, delivering integrated instrumentation and engineered solutions to the utilities, industrial process and environmental industries. In 25 years we have grown from a small specialist subcontractor, into one of the largest system integration providers in the UK industrial utilities market.

We specialise in a number of application areas throughout the utilities markets including; gas analysis & gas quality measurement, materials & gas flow measurement and specialised sampling systems. Over the years Orbital have broadened our activities in the utilities markets and today offer complete end to end telemetry solutions, which include distributed network telemetry systems, SCADA and RTU systems have become one of the mainstays of Orbital’s expanding product solutions portfolio.