

Hydrovane compressors used in pioneering biomethane gas distribution trial

A rotary vane gas pressure boost compressor from Hydrovane has assisted with a pioneering trial on the redistribution of biomethane gas into the national gas grid.

Benefits-at-a-glance

- Biomethane injected into suitable gas network at a steady rate
- Reduced carbon emissions – displacing gas derived from fossil fuels
- Intelligent control system regulates compressor operation
- Low maintenance requirements – minimising downtime



Application Details

Working with UK gas distribution companies Northern Gas Networks, National Grid and CNG Services, a specialist consultancy and systems integrator, Hydrovane supplied a 22kW unit from its G Series of gas boost compressors, for the trial at a network pressure reduction facility in Skipton, North Yorkshire.

The trial was designed to prove the concept of compressing gas from the lower pressure network upstream into the higher pressure network, which has sufficient capacity, so that biomethane can be safely injected at a steady rate into the lower pressure network at all times.

Trial background

Biomethane is developed by cleaning and upgrading biogas, which is typically produced by processing organic materials such as food scraps, manure and sewage sludge in an Anaerobic Digester (AD).

The gas produced by an AD can be used to generate electricity and useable heat locally, known as combined heat and power (CHP). However, if this gas is cleaned up to produce biomethane of the required specification, it can then be directly injected into the local gas

Customer

Northern Gas Networks & National Grid

Location

Skipton, North Yorkshire, England

Application

Biomethane gas distribution

Products

22kW G Series gas boost compressor

Customer Benefit

Capability for biomethane injection into a suitable gas network at a steady rate during periods of low demand i.e. summer evenings.



CNG Services estimates that by 2015 at least 40 sites similar to the test facility will be fully operational in the UK, supplying up to 250,000 homes with biomethane through the regular methane gas network.

This is a highly efficient use of energy and reduces carbon emissions by directly displacing the same volume of gas derived from fossil sources.

However, biogas, and therefore biomethane, is produced by the AD process at a steady rate, irrespective of the downstream demand from consumers. So, when consumption is very low, for example during warm summer nights, the rate of biomethane production, which cannot be easily reduced, would oversupply the gas grid – this could affect 30% to 40% of all AD plants.

Successful outcome

The trial proved that, by removing gas in a controlled manner and compressing it so it can flow upstream into a higher-pressure tier pipeline, effective entry capacity is created.

Sensors were used to detect the pressure in the downstream network. When this had risen above the preset level in the lower-pressure network, as a result of an imbalance between the simulated biomethane injection rate (using a metered

bypass) and consumer consumption rate, the control system turned the compressor on.

In turn, this compressed the gas from the lower pressure network back upstream into the higher pressure network. Once downstream pressure was reduced to the lower preset level, the control system turned the compressor off, resulting in a steady rate of simulated biomethane absorption i.e. flow through the metered bypass at all times.

Following the successful trial, CNG Services estimates that by 2015 at least 40 sites similar to the test facility will be fully operational in the UK, supplying up to 250,000 homes with biomethane through the regular methane gas network.

About Hydrovane's G Series of compressors

Designed to meet ATEX Zone 2 requirements, units in Hydrovane's G Series of compressors feature non-sparking Ex nA motors and remote, safe area electrical starter equipment. All units can be easily integrated in to both new and existing

applications and feature a pressure boost of up to six bar, with flow ranges from 10.0 l/s to 113.3 l/s.

An intelligent inlet system control regulates compressor operation, helping to save energy costs, as the machine adapts automatically to gas flow and will stop if demand falls below a certain level. Larger models in the range also feature variable-speed drives as standard to reduce ownership costs further.

In addition, a specially developed lubricant helps to ensure optimum service life and minimal oil contamination or degradation. This can result in up to 4,000 hours between service intervals*, reducing the frequency of routine maintenance to minimise downtime.

*Dependent on gas