Biogas Gets Motoring

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The diesel emissions scandal, the circular economy and the climate impact of agriculture are together propelling biogas into an important role in the low carbon economy. That is because biomethane, the principal component of biogas, is at the same time a flexible source of renewable energy and a powerful greenhouse gas whose emissions must be controlled.

Key messages:

- Biogas is increasingly important for a low carbon economy
- Biogas is a well-known low carbon source for electricity and heat
- Biomethane (upgraded biogas) is more and more used as clean transport fuel
- Biomethanol is used as building block in the chemical industry
- Biogas production technology is standard, robust and economic
- Biogas is made from a wide range of feedstocks (incl. organic household, agricultural and industrial waste)
- ISCC certification is increasingly applied to prove sustainability and greenhouse gas savings of biogas and biomethane production

Biogas is produced from the decomposition of wet biomass. This occurs naturally in wetlands and bogs, but it can also be harnessed in an industrial process. Biogas consists of 60% biomethane and 40% carbon dioxide with minor impurities, mainly hydrogen sulphide and water.[1] It can be purified with standard technology to produce biomethane with the same specification as fossil natural gas. The industrial anaerobic digestion process to make biogas uses microorganisms to degrade a wide range of materials from woody biomass to organic household, agricultural and industrial waste. The solid residue left is an effective fertiliser. Biogas production is on the increase, not only because of the widespread availability of raw material, but also because the anaerobic digestion technology is robust and economic to operate at a range of scales, down to individual farms.

ISCC certification, to prove the sustainability and greenhouse gas savings of biomethane, is increasingly popular. More than three times as many certificates were granted in 2017 than the year before. The certified raw materials for biogas include sewage, manure, straw and other agricultural waste, sugar beet residues, municipal waste and residues from the brewing industry. Even a world famous Scotch whisky distillery has an ISCC certificate to make biomethane from whisky process waste. ISCC certified biomethane plants are found all over Europe and in the US.

[1] http://www.irena.org/publications/2017/Mar/Biogas-for-road-vehicles-Technology-brief

Methane should not be discharged to the atmosphere because of its high climate impact; it has a global warming potential about thirty times that of carbon dioxide.[2] European regulation ensures that it is collected from biowaste decomposition at landfill sites, but other sources like sewage and farm manure are not covered. To prevent emissions from rotting manure, Dutch livestock farmers can lease small anaerobic digestion facilities to convert manure to biogas. The biogas provides the farmers with additional income.

Biogas is a well-known low carbon source of electricity and heat. But there is also a growing market for biomethane as a sustainable and clean transport fuel. It is increasingly being used as a replacement for diesel in freight and public transport, as cities are banning or restricting diesel engines because of their toxic emissions. Biomethane produces fewer particulates and less acid gases than diesel [3], so it is a better fuel for city centre vehicles. The higher cost of gas-fuelled vehicles is offset by the lower cost of the fuel. Sweden has a fleet of over 2,300 biomethane buses, comprising 17% of all buses in the country.[4] Nottingham in the UK is bringing into service a fleet of 53 biomethane buses, which will save 84% of carbon dioxide emissions.[5] The European Commission has approved an Italian support scheme for the production and distribution of advanced biofuels, including advanced biomethane.[6]

In the UK, retail giants Waitrose and John Lewis are using biomethane fuel in delivery lorries. The latest trucks have high-pressure carbon fibre tanks that increase the driving range to 800km. Great Britain's largest supplier of green gas, who is also an ISCC certificate holder, supplies the biomethane.

Sustainability certification is key to maximising the economic and environmental benefits of biomethane. ISCC can help producers and traders of biomethane, whatever the source of the biogas.[7]

The biomethane can be transported via the gas grid, where it is mixed with natural gas. The gas producer feeding the biomethane into the grid, and the customer taking the biomethane out of the same grid, must both be certified. The quantities fed into and taken out of the gas grid are controlled and verified by public authorities. This tried and tested procedure ensures the integrity of the system. Of course, the biomethane can also be kept segregated and transported by tanker.

Companies that have ISCC PLUS certification can substitute biomethane for natural gas to reduce their CO_2 emissions. Calculation of CO_2 savings is based on EU recognised

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[2] https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

[3] https://www.transportenvironment.org/sites/te/files/publications/2016_02_TE_Natural_Gas_Biomethane_Study_FINAL.pdf

[4] http://euinmyregion.blogactiv.eu/2016/07/04/biogas-buses-are-the-green-solution-for-cities/

[5] https://www.nctx.co.uk/about-us/gasbus/

[6] http://europa.eu/rapid/press-release_IP-18-1441_en.htm

[7] https://www.iscc-system.org/wp-content/uploads/2017/02/ISCC-Guidance-Document-201-3_Biogas-and-biomethane.pdf

methodology. Verification of the calculation takes place during auditing. Europe's two leading producers of biomethanol from biomethane are ISCC PLUS certificate holders.

Biomethanol is used in the chemicals industry as a building block. Biogas is also a valuable raw material for electricity and heat production. Currently, two biogas plants are certified under ISCC PLUS in Germany, which supports them to market the electricity directly. Challenges like leakage of methane during fermentation or from storage of raw materials and products are addressed by ISCC certification. The auditor also checks that heat produced by the biogas plant is used efficiently.

Europe is focussing more and more on reusing vital resources within a circular economy model. Separate collections of household and industrial biowaste will become the norm. So whether it's city authorities, sewage treatment works or whisky distilleries, there will be more organisations and more biowaste to provide biomethane. Something we can all drink to.

If you would like to learn more the application of ISCC certification for biogas or biomethane please do not hesitate to write an email to info@iscc-system.org.