



Biogas and Biomethane Factsheet

What is Biogas?

Biogas is produced when organic matter such as crop residues, animal manure, food waste, industrial organic waste and sewage sludge is broken down by micro-organisms in an oxygen-free (anaerobic) environment. The composition of biogas varies according to the raw materials and processing methods however, it primarily consists of methane (50-70 percent) and carbon dioxide (25-45 per cent), plus traces of other gases including nitrogen, hydrogen and hydrogen sulphide.

Biogas can be used as a combustible fuel in boilers and cogeneration plants for electricity and heat. It can be upgraded to biomethane for grid injection as a direct substitute for natural gas.

Biogas vs Biomethane

Biomethane is produced when biogas is upgraded to remove carbon dioxide and other contaminants to meet Australian specifications outlined in Australian Standard AS 4564-2011. As the chemical composition of biomethane and natural gas are similar, upgrades or modifications to gas infrastructure are not required and biomethane can be directly injected into an existing natural gas network. Biomethane is also known as Renewable Natural Gas (RNG) in some countries.

Technology Pathways

Anaerobic Digestion (AD) is a series of biological processes where micro-organisms digest organic wastes under low levels of oxygen, in sealed containers or ponds. The process extracts energy from organic material in the form of biogas. The organic material left over (known as digestate), is rich in organic matter and nutrients such as nitrogen, phosphate and potash and can be used as a non-synthetic fertiliser.

Biogas is upgraded to produce biomethane through separation of various gases within biogas. The process of upgrading biogas is utilised for approximately 90% of the global supply of biomethane. Water scrubbing and membrane separation are the most commonly used upgrading technologies, producing up to 60% of biomethane.

Drivers and Opportunities

The main drivers for biogas production are waste management, climate change mitigation and renewable energy generation. When biogas is captured from waste and combusted directly, or indirectly as biomethane, greenhouse gas emissions are reduced, making this process a powerful abatement activity. In addition, the nutrients within the solid byproduct (digestate) can be recycled into an organic fertiliser reducing the need for intensive synthetic fertilisers.

Biomethane presents opportunities to decarbonise the gas network, provide renewable heat for industry and extend the life of existing gas appliances and infrastructure and can play a significant role in the transition to a low-carbon economy.

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