Renewable Gas | Jemena

FACT SHEET

Renewable Gas explained

The future of renewable gas is changing thanks to the evolution of renewable gases, such as renewable hydrogen, which is generated using renewable electricity, and biomethane, which is produced using naturally occurring organic materials like wastewater and agri-waste. Also helping to increase gas supply, empower our manufacturing base, foster energy security, and reduce waste.

As stated in the Australian Energy Market Operator's 2024 Gas Statement of Opportunities, renewable gas will also help support consumers' choice as traditional sources of gas supply decline. Over 5 million Australian households and businesses rely on gas to fuel their hot water, heating and cooking needs, with gas making up over one third of their energy usage. There are also thousands of industrial companies and manufacturers committed to reducing emissions that will remain dependent on gas and the high heat it delivers for their processes and operations for the foreseeable future.

Renewable Gas will not only support other clean energy technologies such as solar and battery storage, but utilise the almost 100,000 km of existing, exceptionally reliable gas network assets for energy storage and distribution, helping to provide another solution in the energy transition.

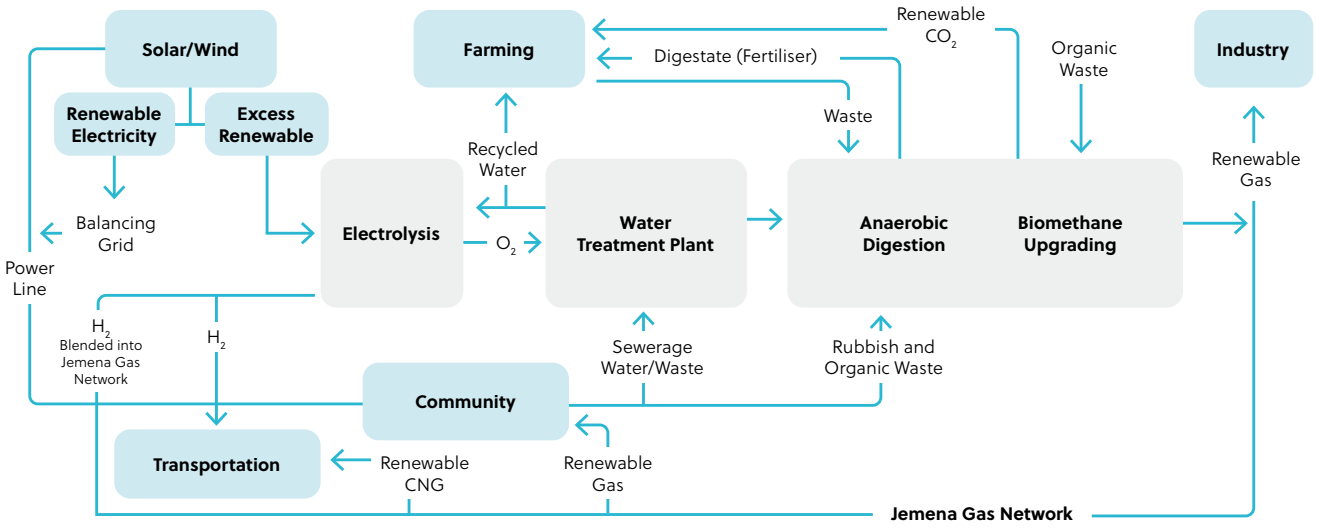
Renewable Gas

(noun)

An umbrella term for gases produced using resources that are continually replenished.

Types of renewable gases include renewable hydrogen, made using renewable electricity, and biomethane, made from organic waste.

THE CIRCULAR ECONOMY OF RENEWABLE GAS



Renewable Gas can help support the energy transition

1 / Biomethane

Biomethane is a reliable and responsive energy source that can help us transition to a lower emissions economy. It is produced by capturing biogas from decomposing plant and animal by-products, agriculture, farming, forestry and human wastes, and removing the carbon dioxide, hydrogen sulfide and other contaminants. As a direct substitute for natural gas, it is compatible with our existing gas infrastructure and appliances.

Australia has a significant agricultural and industry base for biomethane production, contributing to a more sustainable circular economy by capturing gas from decomposing agricultural, organic and domestic waste that would otherwise end up in the atmosphere. According to ARENA's Bioenergy Roadmap 2021, Australia has enough feedstock to see biomethane account for 23 per cent of the total pipeline gas market by 2030.

The Government's Clean Energy Regulator describes biomethane as a "methane-rich net-zero carbon emissions natural gas substitute*" derived from the anaerobic digestion of putrescible waste, agricultural residues, wastewater, and food processing and manufacturing.

For many Australian industries, gas will remain a critical source of energy into the future, and biomethane stands as the only credible and genuine short-to-medium term solution for not only emissions reduction but helping to enable a lower-cost energy transition for this sector (compared to full electrification).

Jemena is producing biomethane at Sydney Water's Malabar Wastewater Treatment Plant in South Sydney. As Australia's first biomethane-to-network project, Jemena's Biomethane Injection Plant is injecting renewable gas into the natural gas network, the largest in Australia with over 1.5 million customers across Sydney and parts of regional New South Wales.

* https://cer.gov.au/document/biomethane-method-package-simple-method-guide

2 / Renewable Hydrogen

Renewable Hydrogen is produced when renewable electricity is used to split water into hydrogen and oxygen through a process of 'electrolysis', as demonstrated in 'Figure 1' below.

Both the Western Sydney Hydrogen Hub and Malabar Biomethane Injection Plant are co-funded by Jemena and ARENA (Australian Renewable Energy Agency).

Jemena's gas distribution network is the largest in NSW. It delivers natural gas to over 1.5 million residential and business customers across Greater Sydney and parts of regional NSW.

ARENA is the government agency responsible for supporting the transition to net zero emissions by accelerating innovation for the benefit of Australian consumers and business.

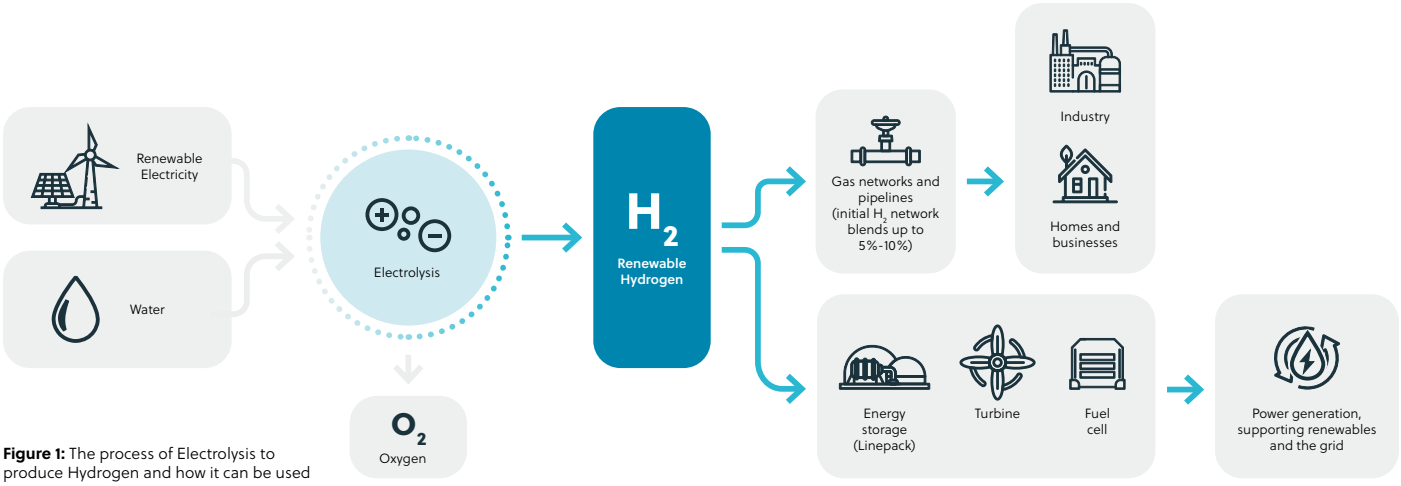


Figure 1: The process of Electrolysis to produce Hydrogen and how it can be used

Although natural gas emits up to 50% less carbon than other fossil fuels, hydrogen burns with no carbon emissions at all. When produced using renewable electricity, hydrogen could be an important carbon-neutral fuel to support a net zero emissions future. It can also be blended with natural gas and biomethane and stored in large volumes within existing gas networks for when it is required – just like a battery can store excess renewable electricity. Initially hydrogen will be blending in networks to 10%, without the need to change consumer appliances.

The Federal Government's recent commitment of $4 billion for the Hydrogen Headstart program, to help plug commercial gaps in scaling up development of the renewable hydrogen industry, is a clear signal that hydrogen is still considered a part of Australia's energy future.

Jemena is proud to be playing a role in pioneering that future through our Hydrogen pilot production facility in Western Sydney, which will demonstrate the practical potential for a transition to lower emissions with renewable gas.

3 / e-Methane

A third form of Renewable Gas is e-Methane (also sometimes referred to as Synthetic Natural Gas), which can seamlessly replace natural gas in our gas networks as a low-carbon or carbon-free substitute (depending on the source fuel). Producing e-Methane involves reacting renewable hydrogen with carbon dioxide to produce synthetic renewable methane and, depending on the feedstock, it can be a low-carbon substitute for fossil fuel. This technology is currently in the early stages of commercialisation in some overseas markets.

More about Biomethane

The main advantage of biomethane is that it can be injected into existing gas networks without having to upgrade pipelines and other gas assets, including residential and commercial gas appliances, offering a critical pathway to reducing carbon emissions in gas networks and energy systems, as demonstrated in 'Figure 2'.

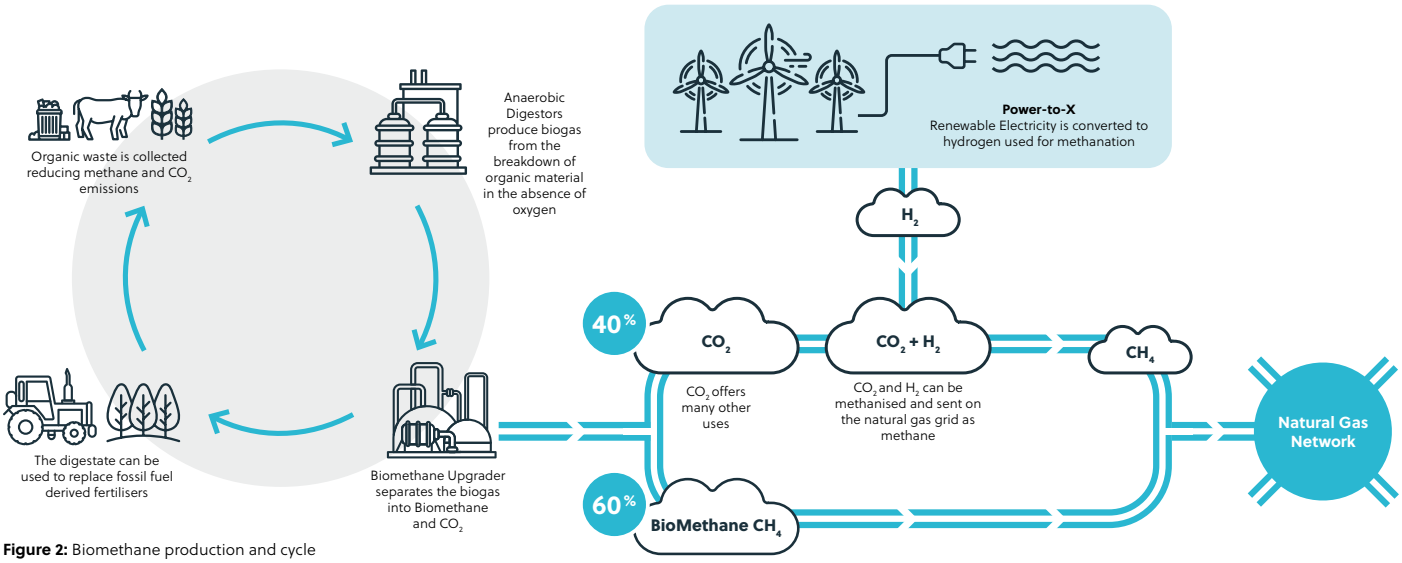


Figure 2: Biomethane production and cycle

The combustion of biomethane, and other types of organic waste or biomass, emits biogenic CO2 which would be part of the natural biogenic carbon cycle if that waste were to decompose (see Figure 3), whereas burning fossil fuels releases carbon into the atmosphere that has been locked up in the ground for millions of years.

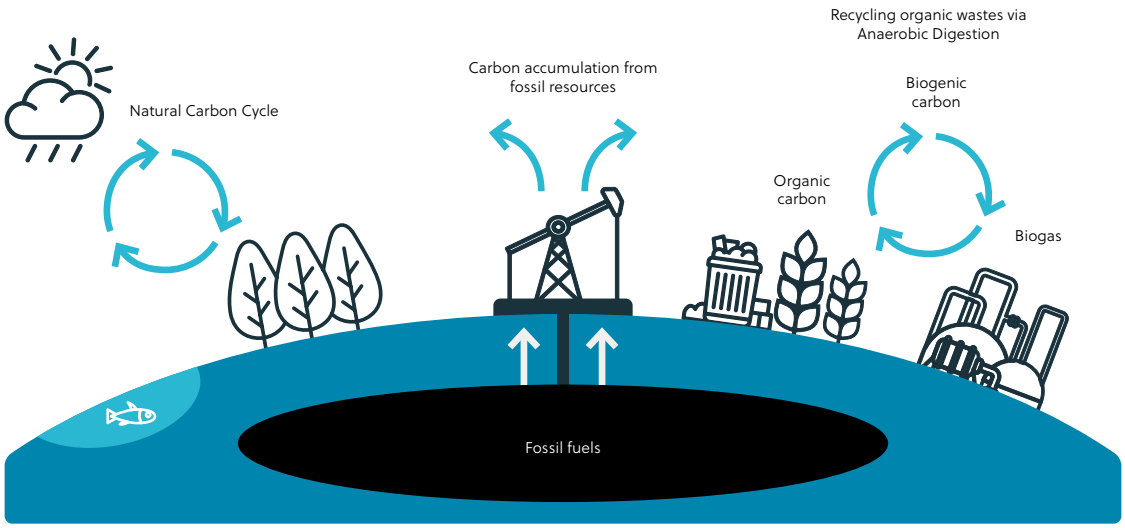


Figure 3: Biogenic Carbon Dioxide Cycle

Renewable Gas

For more information visit **gorenewablegas.com.au**

Or contact us to find out how Renewable Gas is on track to help support the energy transition for households, businesses and communities across NSW.

gorenewablegas.com.au

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