Unlocking the power of gas as a source of renewable energy

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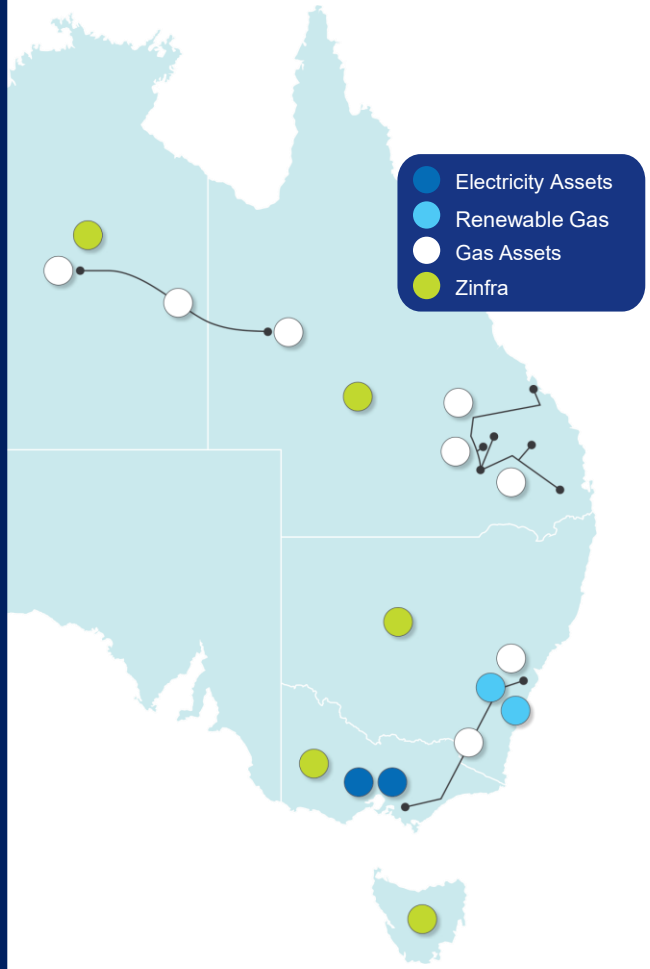
Acknowledgement of Country

We acknowledge the Traditional Owners of the land on which we operate and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

"Jemena" is an **Aboriginal word, and** it translates to **"to hear, to listen, and to think"**

The Jemena Group



$12.9 billion
energy infrastructure company

Jemena & Zinfra

>1.92 million
customers

Electricity & Gas
distribution

Gas
transmission

Engineering
solutions

Who are the future users of gas?

Customer Type	Hard-to-abate	Costly-to-electrify	Desire-for-gas	Coal to gas switching
Customer Portrait	No identified electrification pathway	Theoretic electrification pathway – but renewable gas is cheaper	"Simple" electrification pathway, but preference for gas	Use coal. Can switch to gas
Industry Sector	High heat, feedstock and GPG	Hospitals, food and beverage manufacturers, some residential customers	Restaurants, bakeries commercial buildings, residential customers	Power generation, steel mills, metal processing, cement production
Example	InfraBuild Building futures through sustainable steel	NSW		BlueScope

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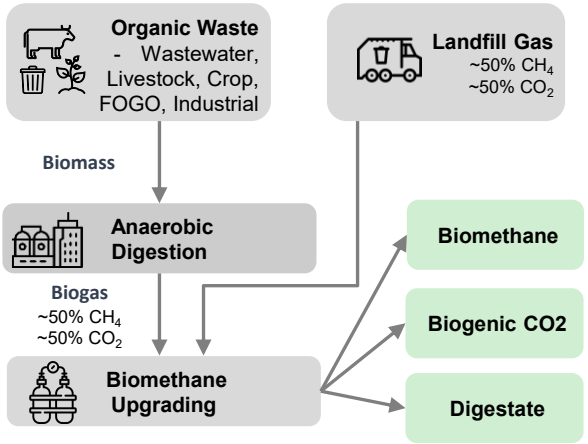
What are Renewable Gases?

Biomethane

A form of renewable methane captured from decomposing organic waste. It is an alternate source of natural gas and classified as net-zero by the CER.

The biomethane being used by **MasterChef** comes from a demonstration facility in NSW owned by Jemena (Malabar).

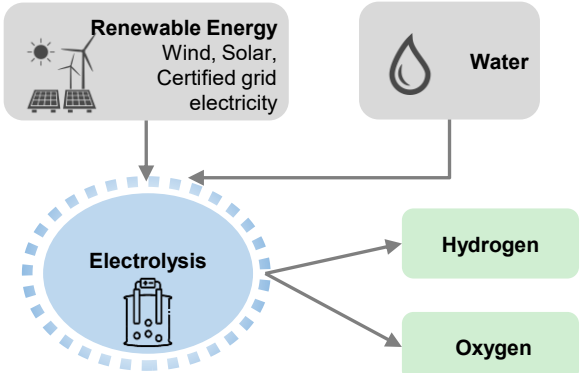
MasterChef



Green Hydrogen

Hydrogen is considered "green" when produced from renewable electricity

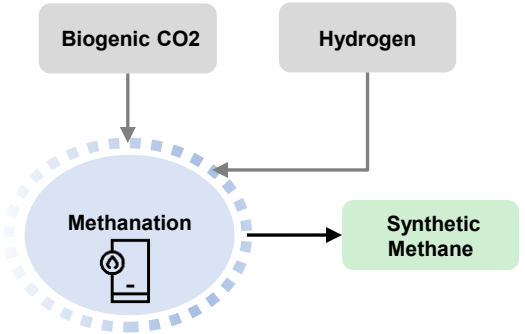
Water is split into hydrogen and oxygen through a process called electrolysis.



Synthetic Methane

A form of renewable methane derived from alternate fuel sources

Depending on the fuel source, synthetic methane can be a low-carbon or even carbon-negative substitute for fossil fuels E.g. Methanation using biogenic CO_2 and green hydrogen



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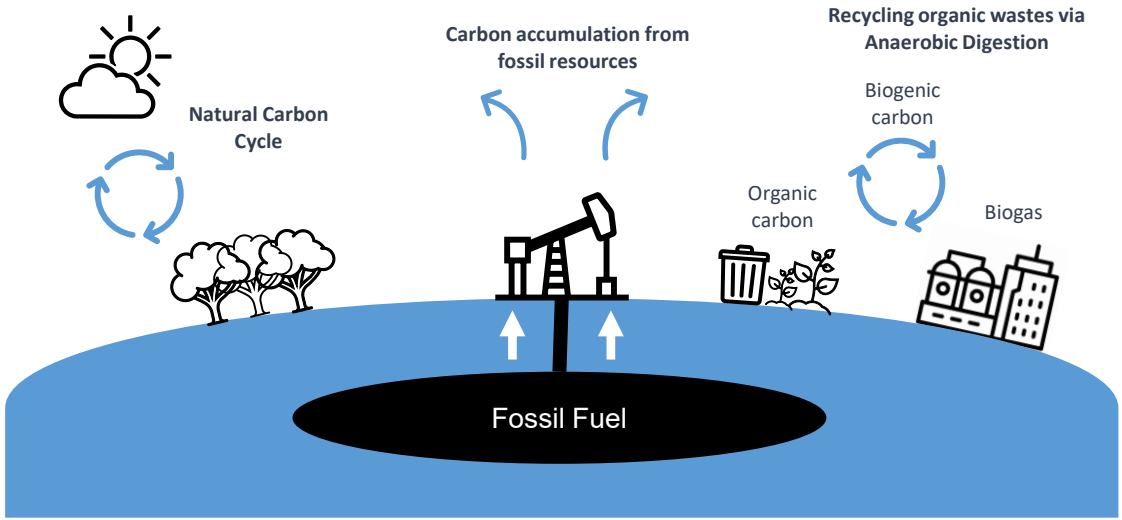
How is biomethane a low emission gas?

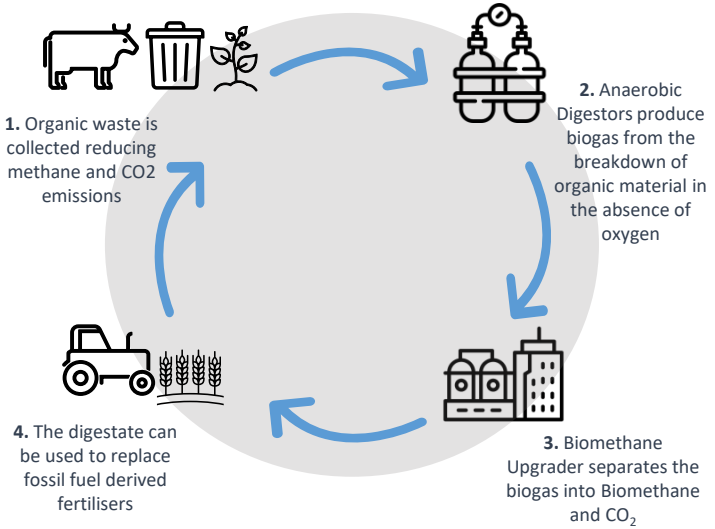
The carbon cycle

- If waste were to decompose, CO2 would be emitted as part of the natural carbon cycle.
- Whilst the creation of biomethane emits CO2, this is the same as the emissions from the natural carbon cycle. There is no net increase.
- Burning fossil fuels releases carbon that has been locked up in the ground for millions of years, increasing atmospheric CO2.



The circular economy of biomethane

Capturing gas from decomposing waste contributes to a more sustainable circular economy



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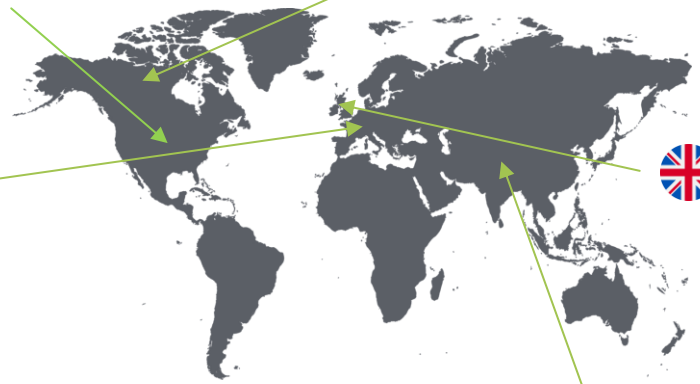
International Biomethane Landscape

United States
- 282 operating biomethane facilities production ~63.3PJ

Canada
- Currently produce >17PJ of biomethane
- 32 plants in operation



Europe
- 1678 biomethane plants in Europe
- 900 new plants planned to come online by 2030
- >34% biomethane in Denmark's gas networks with aim of 100% by 2030
- >11% in Italy's network
- Ireland aiming for 100% biomethane in gas network by 2045
- By 2050, biomethane could meet 62% of EU gas demand

United Kingdom
- More than 80 biomethane plants connected to the grid

Asia
- 130 biomethane plants in China producing ~40PJ per annum as of 2024
- Holds ~30% of global bioenergy potential

Biomethane is a proven emissions reduction pathway used throughout the world

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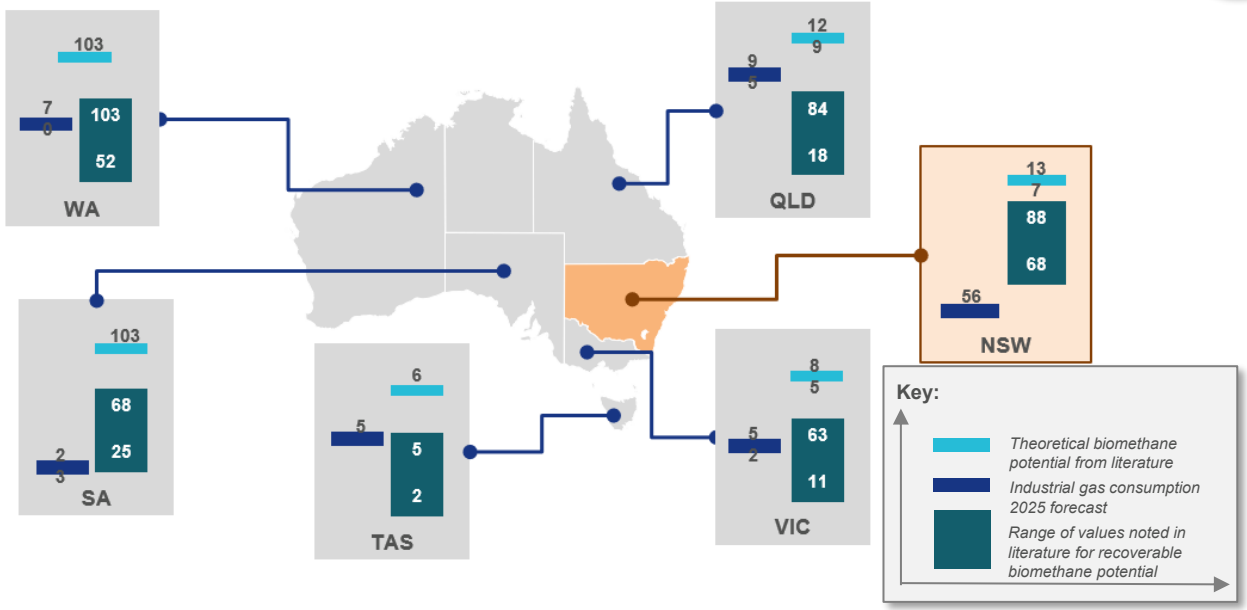
Source: *International Energy Agency, Outlook for Biogas and Biomethane, 2024 China Biomass Energy Industry Development Annual Report*

Australia has large biomethane potential

- Australia's natural gas consumption: ~913PJ p.a.
- Australia's Industrial natural gas consumption: ~301PJ p.a.
- Recoverable biomethane potential: ~411PJ p.a. (Theoretical potential: 563PJ p.a.)



A bioenergy industry could deliver by 2050:

GDP

$14 billion in GDP

35,300 new jobs

CO_2 reduction

12% reduction in emissions

On the East Coast the theoretical biomethane potential represents ~96% of gas consumption

Source: Blunomy 2025

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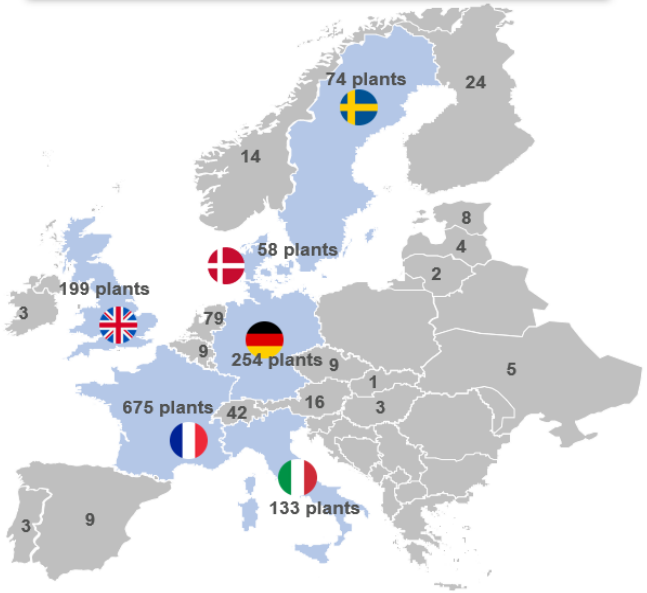
Policy settings determine the success of a market

Key Markets	Target	Supply side incentives	Demand side incentives
Sweden	54PJ by 2030	➢ Production tariff	➢ Long-term tax exemptions ➢ Rebates on vehicles ➢ Zone exemptions
Denmark	Share of biomethane reach 70% by 2030	➢ Production subsidy	
UK	144PJ by 2050	➢ Green Gas Support (FiT) ➢ Renewable Heat Incentive	➢ Renewable Transport Fuel Obligation (blending %)
Germany	Emission reduction of 25% by 2030	➢ Renewable Energy Act	➢ Tax incentives
France	➢ 282PJ by 2030 ➢ Blending target: 6.6% by 2028	➢ Grid operator contribution (60% of capex) ➢ €900 million French support scheme	➢ Tax incentives (TICGN)
Italy	141PJ by 2026	➢ Long-term Incentives support (40% of capex)	➢ CIC certificates used in transportation
Europe Overall	1,236PJ by 2030		

Number of biomethane plants in Europe 2024[1]



A balance of supply and demand side policy initiatives are required

Source: *International Energy Agency, Outlook for Biogas and Biomethane, 2024 China Biomass Energy Industry Development Annual Report*

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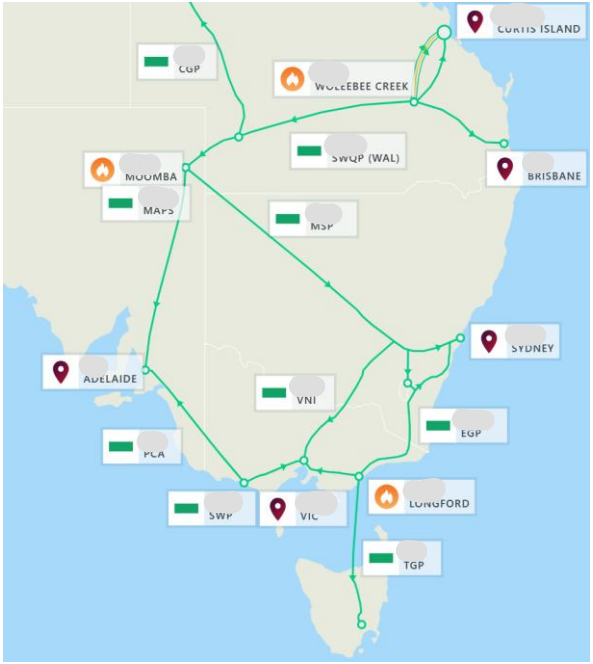
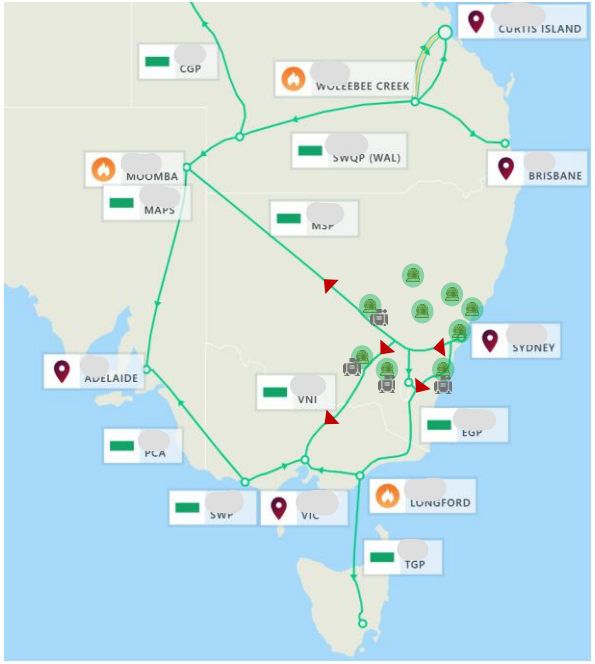
Australia's biomethane policy is gaining traction at both Federal and State level

Renewable

Policy	Impact to biomethane market	Status
National Greenhouse and Energy Reporting Scheme (NGERs)	✓	Completed – Market Based Method for Renewable Gases (Biomethane and Hydrogen) enables the RG market
Guarantee of Origin (GO) Scheme	✓	Completed – Hydrogen In Progress – Expansion to include Biomethane Q1 2026
National Gas Specification 2025 amendments to AS4564	✓	Completed
Renewable Fuels Strategy/Scheme	✓	Completed – Hydrogen In Progress – Expansion to include Biomethane Q3 2025
Victoria Renewable Gas Target	✓	In Progress – expected Q4 2025
ECMC Federal Renewable Gas Policy	✓	In Progress – Policy approach expected Q3 2025

Renewable gases utilise existing gas infrastructure, but flow profiles will look different in the future





Legend

- Biomethane Plants
- Compressors
- Reverse flow

With higher renewable gas penetration, supply will become disaggregated, utilising existing infrastructure but sourcing gas from low emissions facilities

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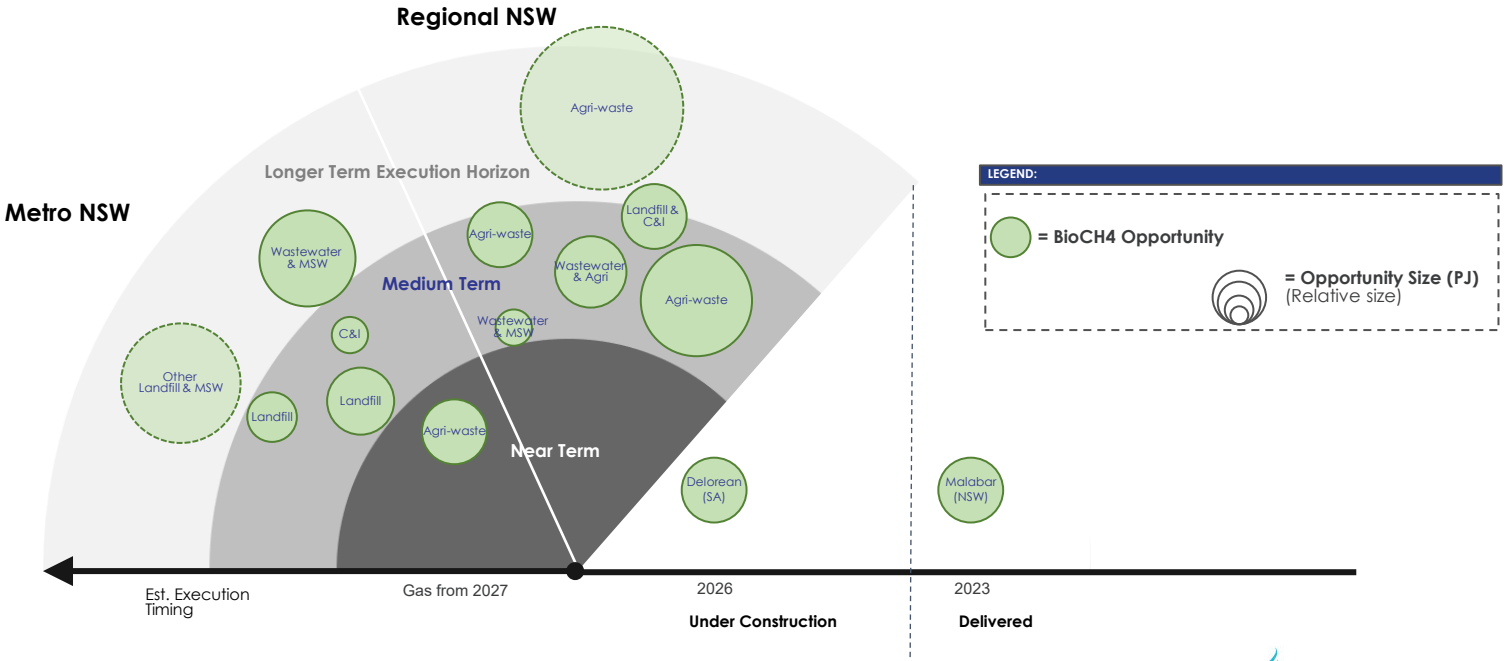
There is a strong pipeline of projects

Jemena has signed MOUs to explore the network connection opportunities of over **10.3PJ/a of biomethane** spanning metropolitan and regional NSW…



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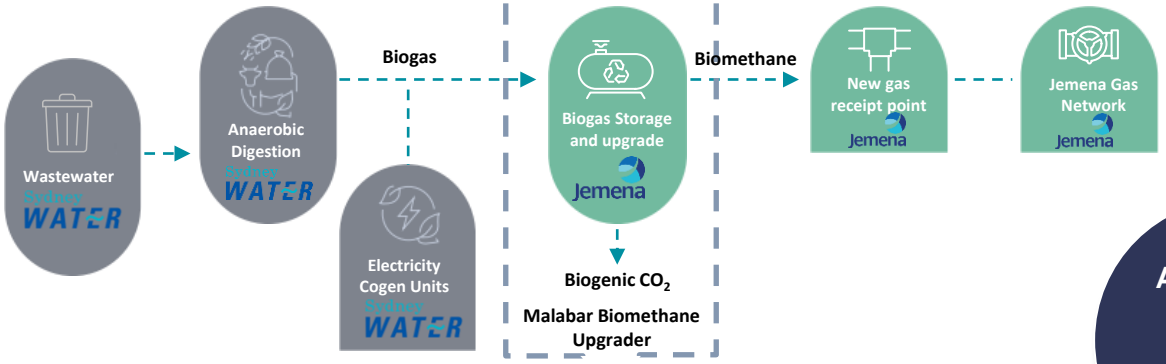
Malabar Biomethane Injection Project

Biomethane Production Overview



Biogas Produced
~300-400TJ/a

Biogas produced onsite largely used as a zero-carbon fuel in electricity generation and creation of LGCs

Flaring
~100TJ/a

Biogas produced in excess of generation requirements being flared

Capture & Upgrade
~100TJ/a

Instead of flaring, this gas could derive further beneficial use by being upgraded and injected into the natural gas network

Purchase Agreement
origin

Operational 18 July 2023

GreenPower®
First biomethane in Australia to receive GreenPower certification

Australian Government
Australian Renewable Energy Agency
ARENA
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