GAS INFRASTRUCTURE TRANSITION TO RENEWABLE GAS

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Jemena
bringing energy to life

Market Dynamics

NSW

Insights - NSW market

Over 1.5 million residents of NSW use gas in their homes and businesses – more than any other state or territory.

In NSW, natural gas contributes to 9% of the State's emissions and stationery energy (excluding electricity) is 11%. This needs to be balanced with the need for reliable, safe and affordable energy.

Jemena

Our Gas Network

25,000 Kilometers in length

Over 1.4 million customers
Residential, Business, and Industrial

Supply to sites in Sydney, Newcastle, the Central Coast and Wollongong
+ Covers 20 Regional centers

Gas Networks 2050

Response to the energy transition, and uncertainty for the future role of gas networks.

Gas Networks 2050 is made up of:

- Customer engagement
- An Advisory Board
- An Expert Panel

What's on Jemena's mind?

"Connecting Customers to a Renewable Energy Future"

Future scenarios (e.g. AEMO's)

Customers' and stakeholders' feedback

Experience of other regulators and networks

Our engagement principles

Australian Energy Regulator's Better resets handbook

Regulating gas pipelines under uncertainty

The Renewable gas opportunity and challenge

Great opportunity to foster the development of a diverse range of renewable fuel types.

Supporting the development of biogas, hydrogen, and natural gas

Key considerations

Readiness of our Network

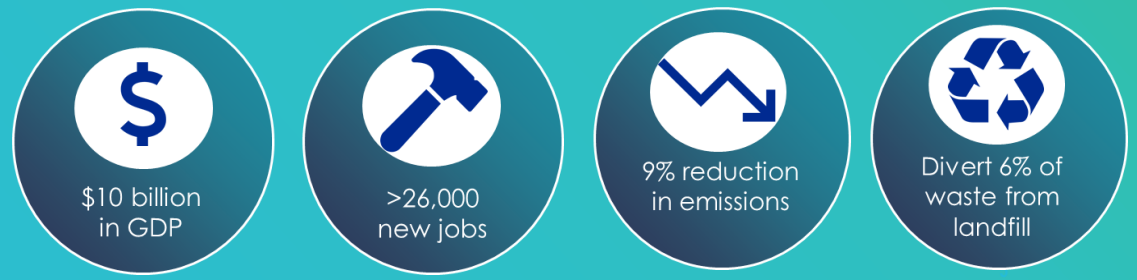
- Understand pipeline suitability for transportation of decarbonized fuels.
- Assess Transmission & Distribution networks

Customer appliances

- Designed to operate safely and effectively under different gas composition scenarios.

By 2030 hydrogen could:

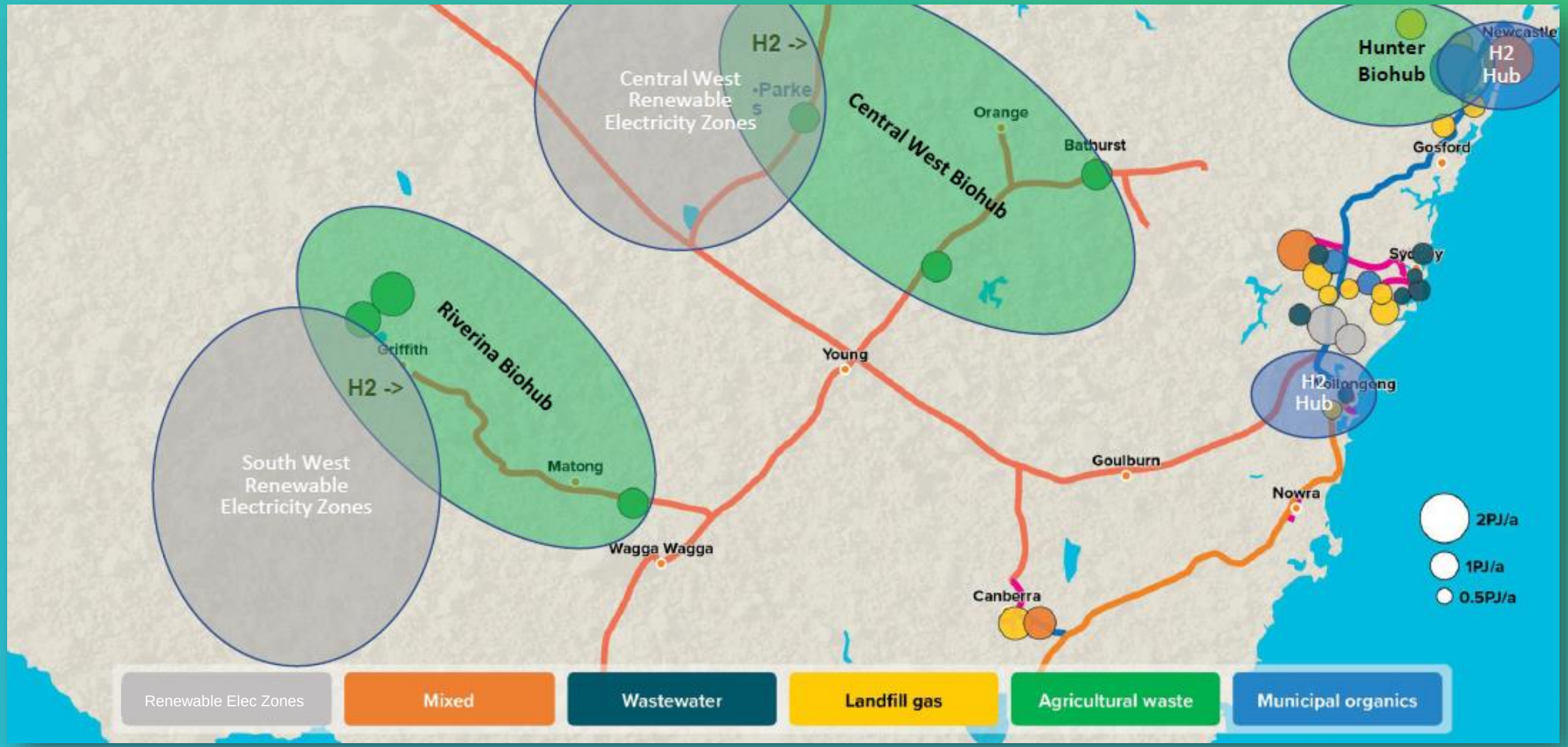
By 2030 bioenergy could:



Our Network

Our Networks | JGN (Trunk, Primary & Secondary)

Our Networks | Potential New Renewable Sources



Our Network | Renewable gas readiness

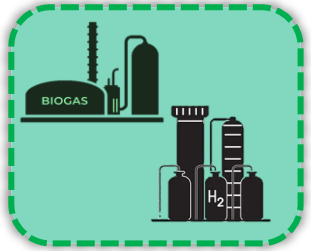
We need to build…

Pipeline to Trunk

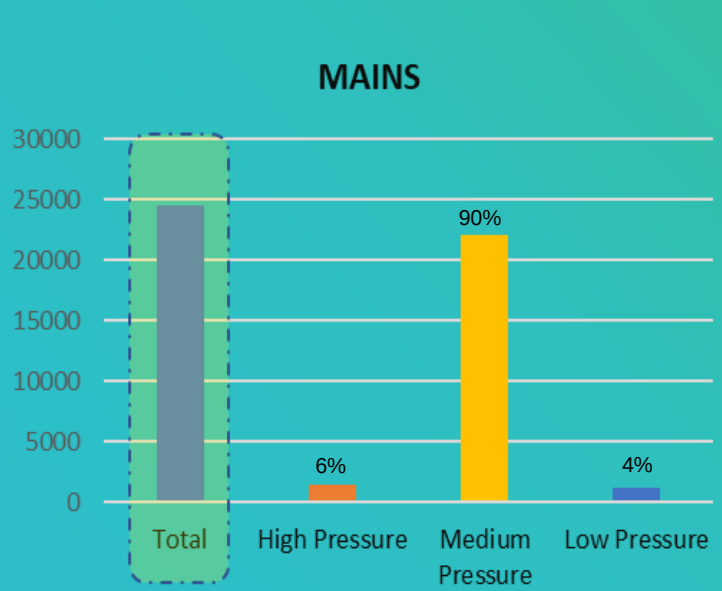
Meter Station

Hot-tap Connection

Gas Chromatograph



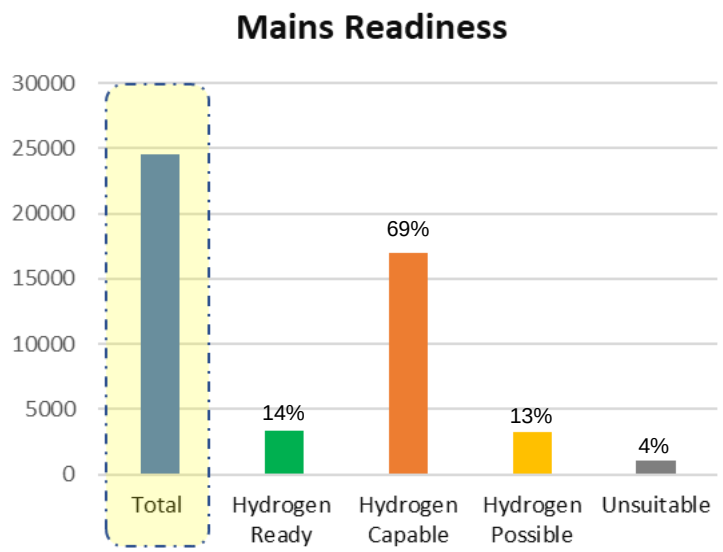
High Pressure	Medium Pressure	Low Pressure
1,400 KM	*22,000 KM*	*1,100 KM*



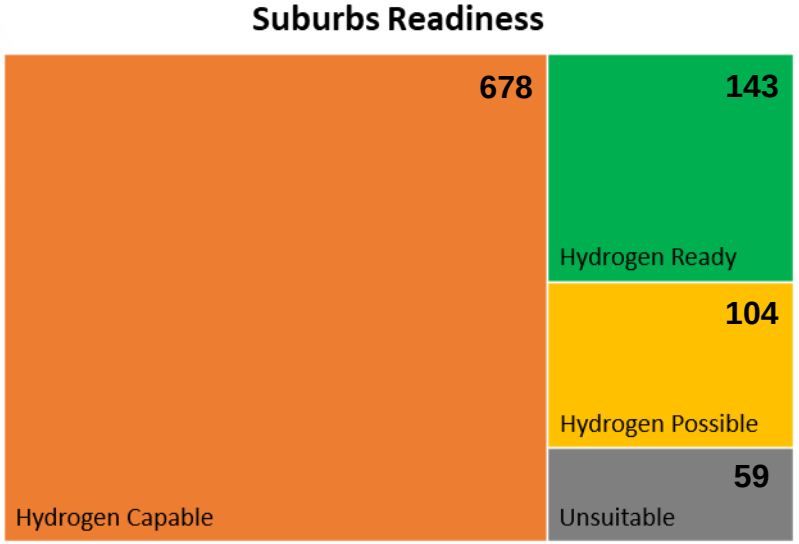
Our Network | Renewable gas readiness

Hydrogen Ready	Hydrogen Capable	Hydrogen Possible	Unsuitable
100% Plastic; <20yr old	*>=99% Plastic; >=20yr old*	<99% Plastic; >=20yr old	<90% Plastic; >=20yr old

Our Mains

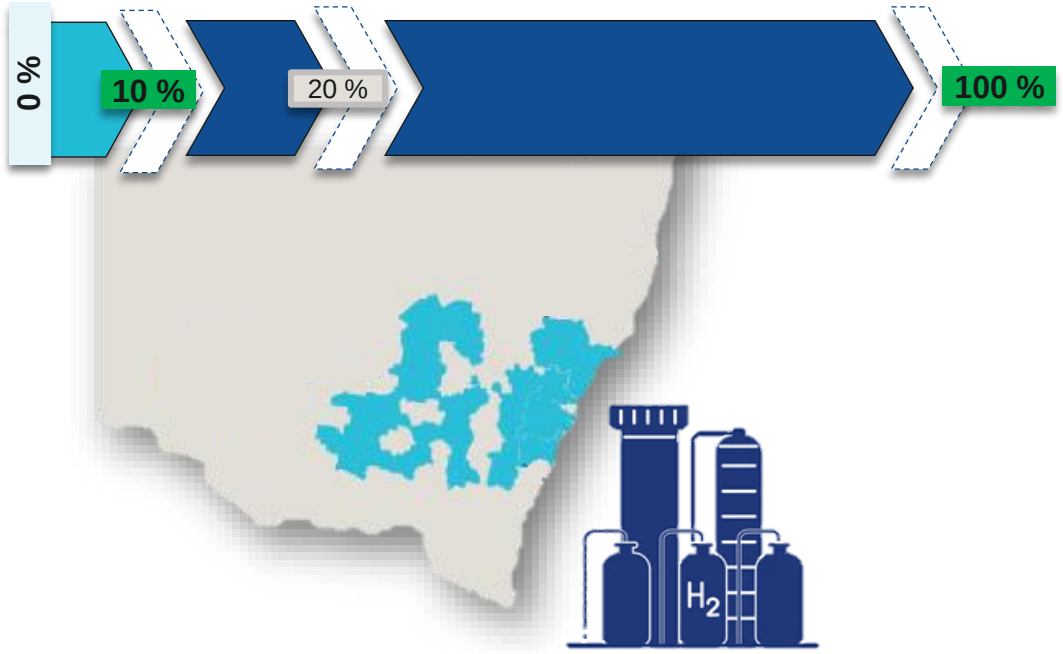


Our Suburbs



Our Network | Renewable gas readiness

GPA - JGN Network Pipeline Assessment Study



Two approaches are taken for the assessment:

- Risk level ranked for failure modes (fracture initiation, brittle & ductile fracture propagation)
- Ranking process + MAOP calculated for design factor 0.5 (ASME B31.12)

Pipeline	10% Hydro	100% Hydro
Trunk (4500kpa)	✓	In progress (ILI – MFL/eMAT)
Primary (3500kpa)	✓	
Secondary(<=1050kpa)	✓	

Findings (so far):

- To exceed pressure, material to be measured in a hydrogen env.
- Conduct ILI (MFL/eMAT)
- Review of safety management study and integrity management

Supporting Transition to Renewable Gases

Key considerations

Should our focus be:

- to just enable renewable gases connection to our network, and/or
- to actively foster the market for renewables?

What we're doing now

Western Sydney Green Gas Project

Trial power-to-gas facility to transform (surplus) renewable electricity into hydrogen gas

Malabar Biomethane Project

Gas is generated by anerobic digestion of sewage sludge at Malabar, Sydney.

Port Kembla Pipeline

Designed to meet both immediate energy needs, for more gas and will also be capable of handling hydrogen

Thank You !