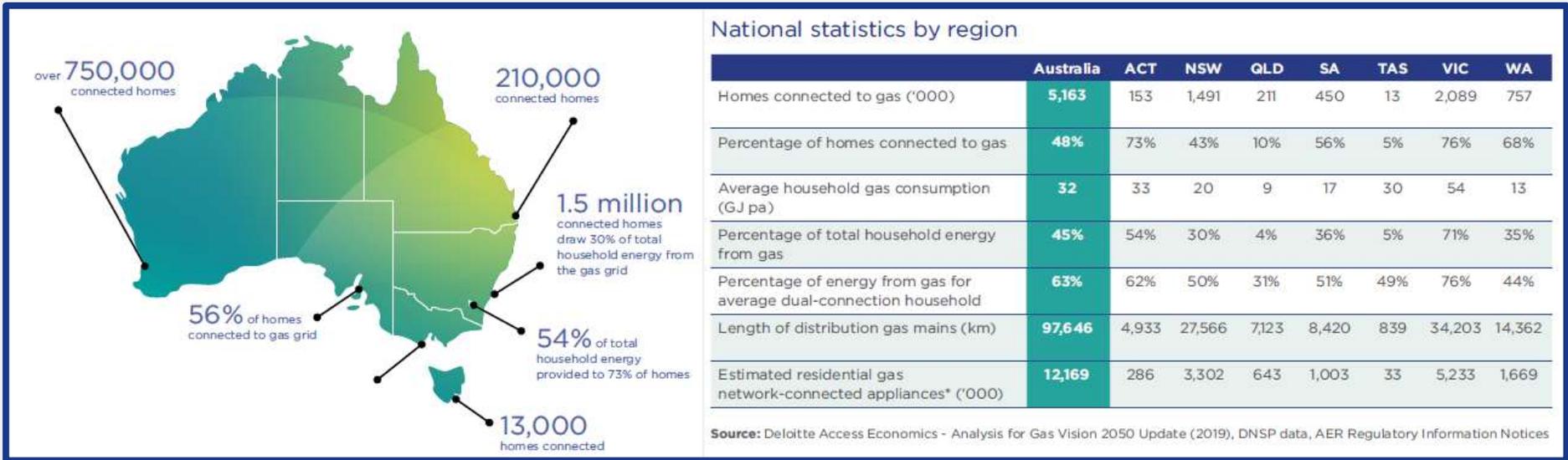




JGN Renewable Gas Outlook

Aug 2021

Before we start lets recap...



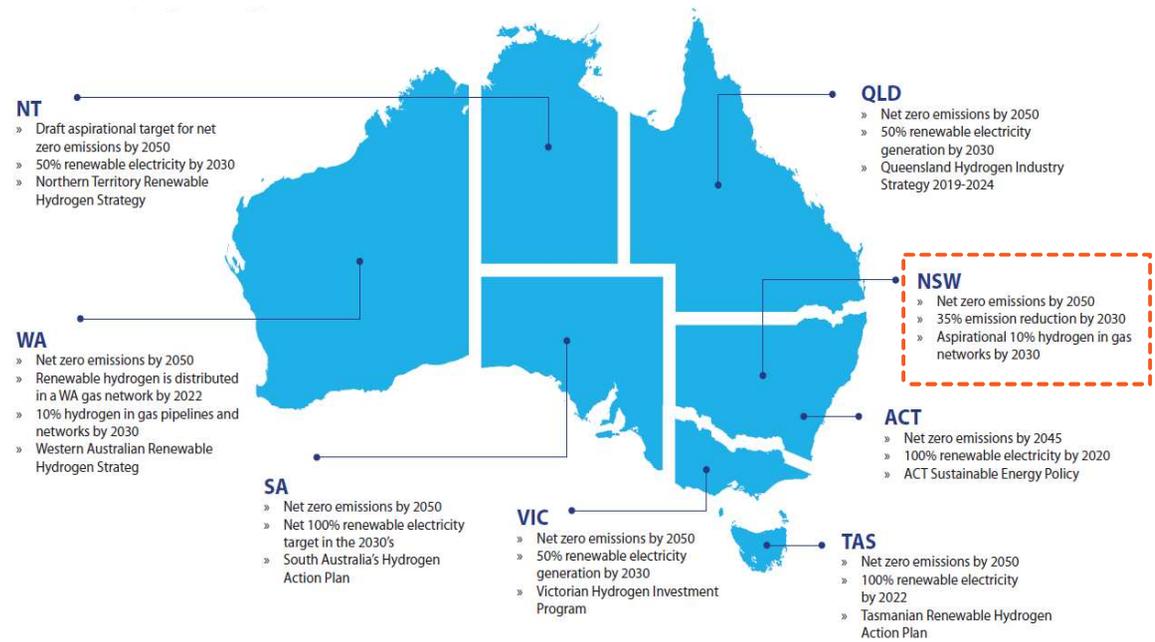
Today there are over 3 million household gas appliances used for cooking, heating and hot water connected to the NSW gas network.



Energy sector is changing so must we...



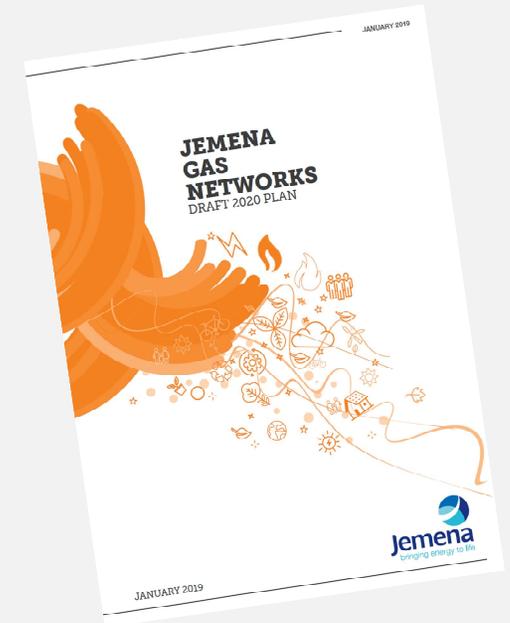
Australia's ambition is to achieve economy wide net zero emissions by 2050 but States are moving ahead with their own renewable targets and plans...



Source: Energy Networks Australia analysis (2020)

What our customers are telling us

- Customers expect Jemena Gas Networks, along with other parts of the energy industry, to innovate and plan for the future so that they can continue to use gas in the longer term, as we move to a low-carbon future - whilst balancing affordability.
- Customers are particularly supportive of innovation where it results in lower long-term costs, improved customer service or community benefit.
- Customers and stakeholders are interested in how innovation could and should be funded (e.g. access to ARENA).



The energy industry is undergoing significant change and customers expect us to respond



What does it mean for gas distribution networks?



Flexible network

Readying gas networks to transport renewable gases
How to best integrate new sources of renewable gas across the gas networks
Examining customer, commercial and technical impacts of transporting varying levels of H2 in gas networks
Robotics, AI and real time data to reduce costs and impacts of field work and improve



Decarbonisation with sector coupling and circular economies:

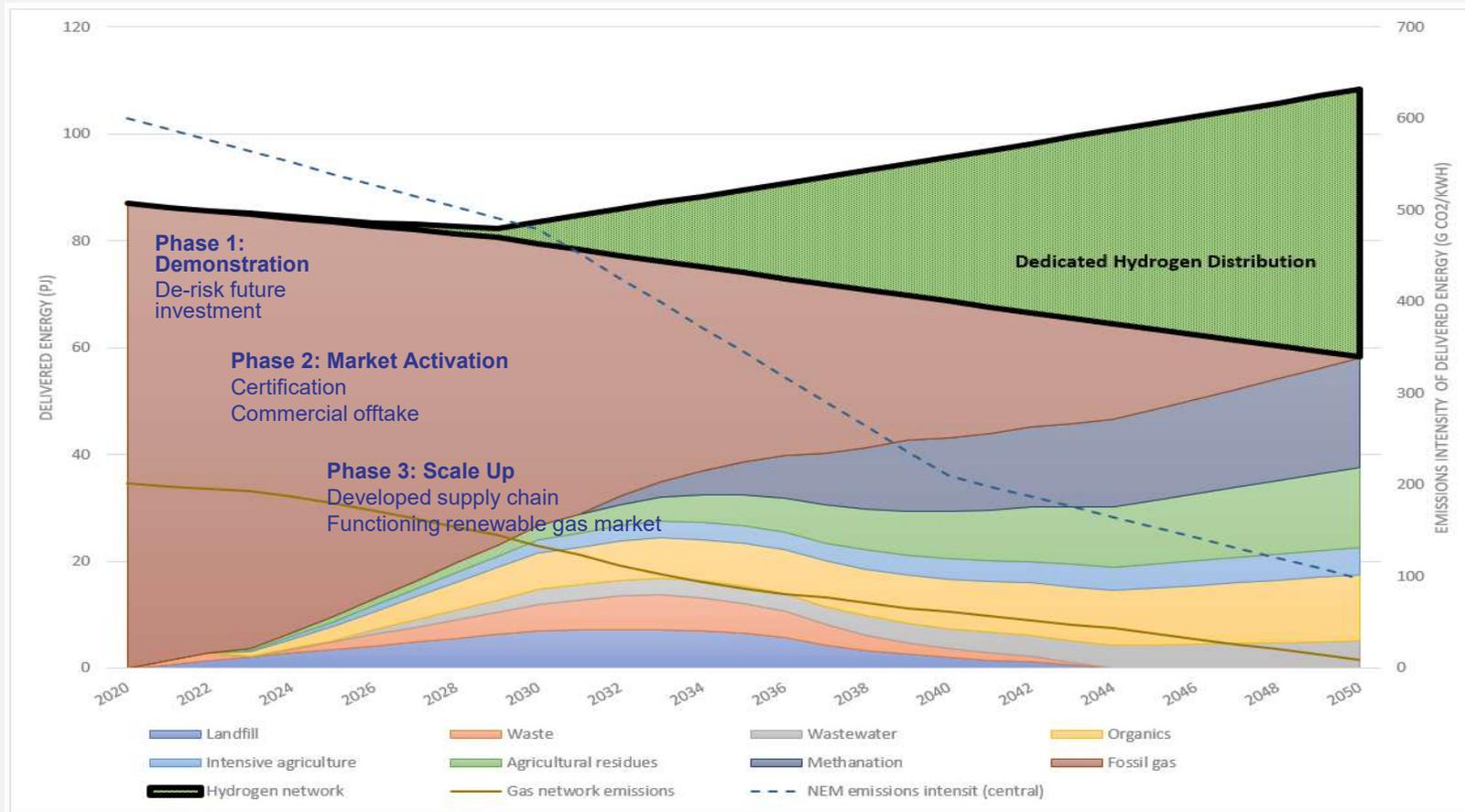
Improved integration of energy infrastructure (e.g. gas and electricity networks)
Decarbonising transport using the gas network
Building purpose-built net zero carbon new developments or precincts (circular economy)
Assessing different feedstocks for renewable gas generation



Enabled customers and market

Exploring future network services required by customers in the decarbonised energy market
(including storage and responsive renewable energy)

Gas Distribution Network – Overview of Potential Decarbonisation Pathways



Western Sydney Green Gas Project Update

Purpose

The project involves a trial power-to-gas facility to transform (surplus) renewable electrical energy into hydrogen gas for use in blending in a gas network, power and potentially transport applications.

Budget

- AUD\$15million (co-funded with Australian Government)

Schedule

- 18 month design and construction
- Commissioning now
- 5yr operational trial

Project Components

- 500kW Electrolyser (expandable)
- H2 grid injection skid
- H2 test and demonstration facilities
- Onsite Power Generator (microturbine and fuel cell)
- H2 buffer storage
- H2 Refuelling capacity
- Rainwater collection



WSGPP – site layout today





Malabar Biomethane Injection Project

- 1 Utilising gas that is generated by Anaerobic Digestion of Sewage sludge at Malabar, Sydney
- 2 300 – 400 TJ/a of biogas is produced onsite and is currently mostly used a zero-carbon fuel to produce LGCs.
- 3 100 TJ/a is currently flared (7000 homes) this the gas that will be upgraded initially.
- 4 There is the potential to expand to 200 TJ/a (14 000 homes) through co-digestion of organics
- 5 First of its kind in Australia – enabling others
- 6 \$14.2M ARENA supported (\$5.9M) project - **key outcome is a Renewable Gas Certification scheme**

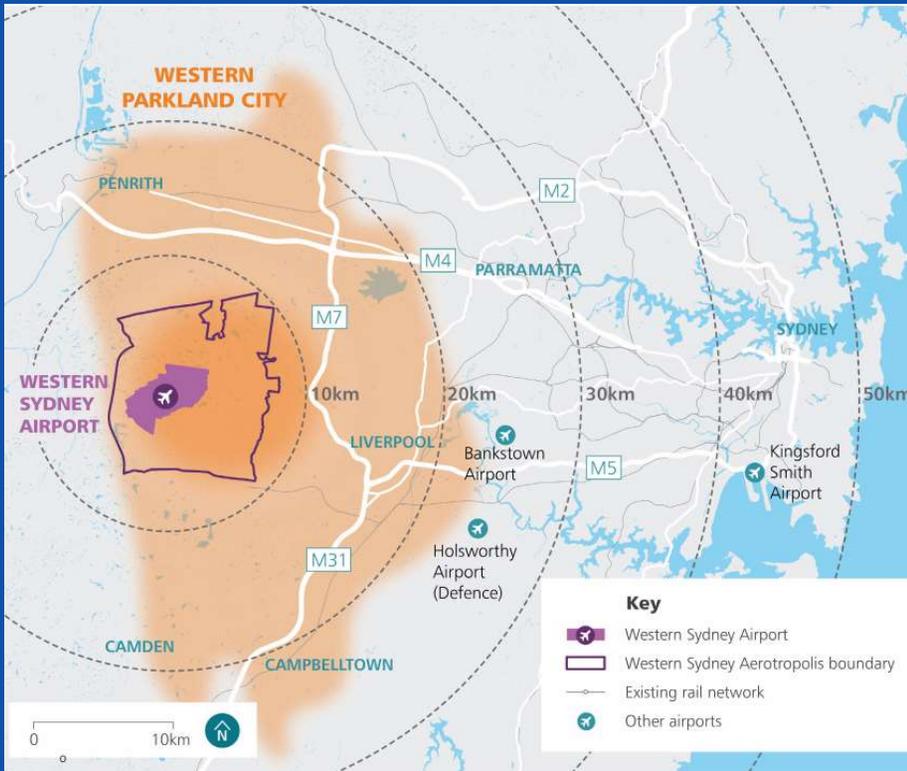
Proposed Gas Network Infrastructure



Malabar Waste Water Facility



Western Parkland City – Circular Economy Applications



Q&A