



# Repurposing Gas Distribution Assets

APGA Hydrogen Symposium

9 November 2022 – Margaret Gayen (GPA) and Robert Davis (AGIG)



# Our Connection to Country

By artist Karen Briggs

## Acknowledgement of Country

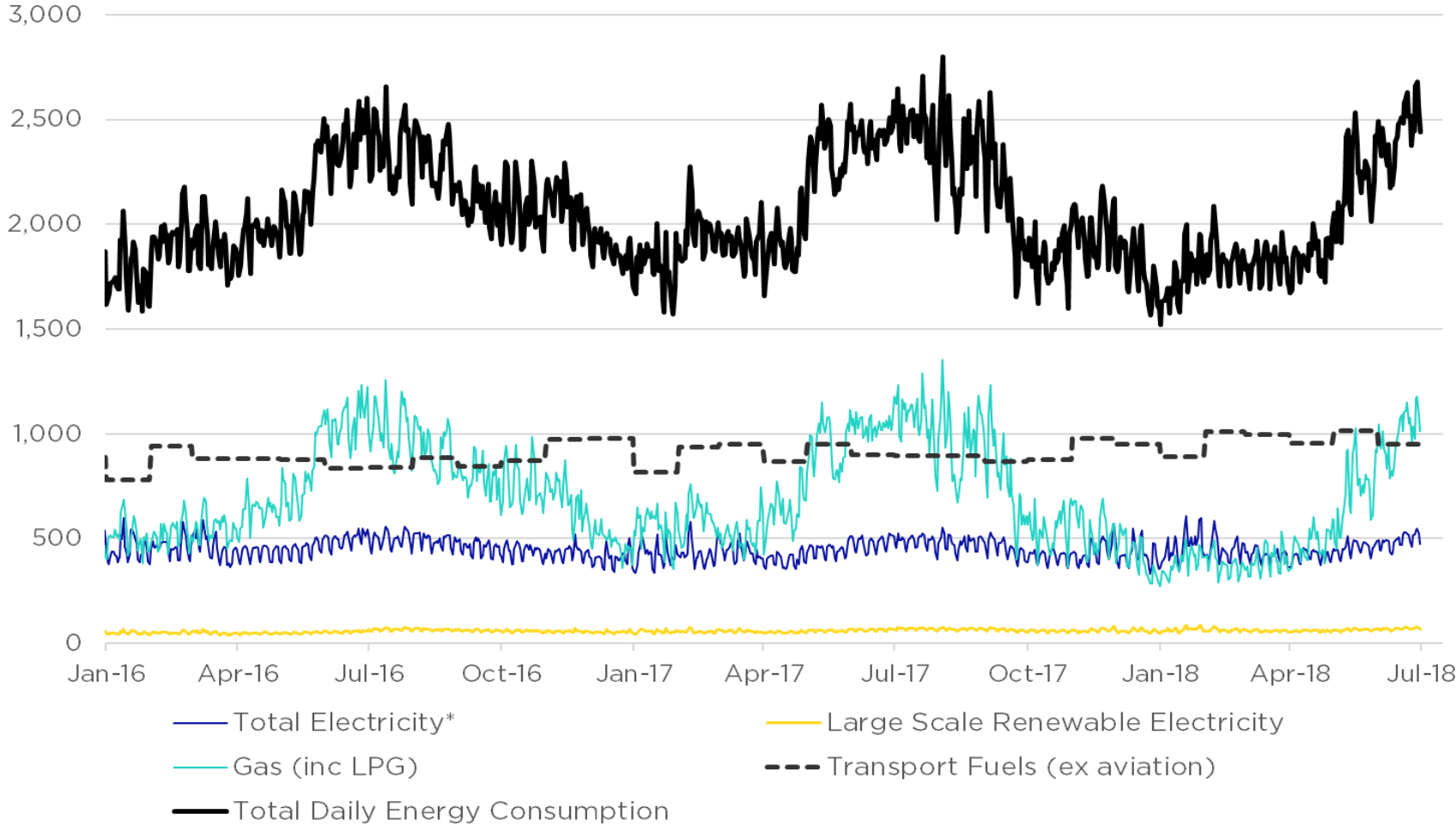
AGIG acknowledges the Traditional Custodians of the lands upon which we live and operate, and we pay our respects to Elders past, present and emerging.

We recognise Aboriginal and Torres Strait Islander people's historical and ongoing connection to land and waters, and we embrace the spirit of reconciliation.



# Setting the Scene | Gas is a Key Part of our Energy Landscape

## Victoria Daily Energy Consumption (TJ)



Note: \*Total electricity includes electricity from gas and renewables, total gas includes gas used for power generation. Total consumption removes this double count.



# Setting the Scene | Our Low Carbon Vision

2021

Hydrogen production and blending operational

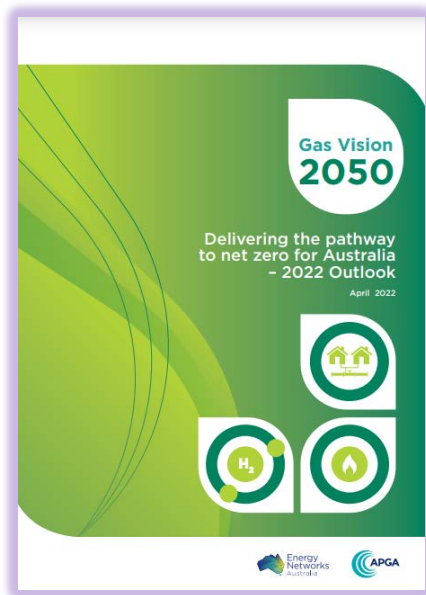
2030

>10% renewable gas in our distribution networks

2040

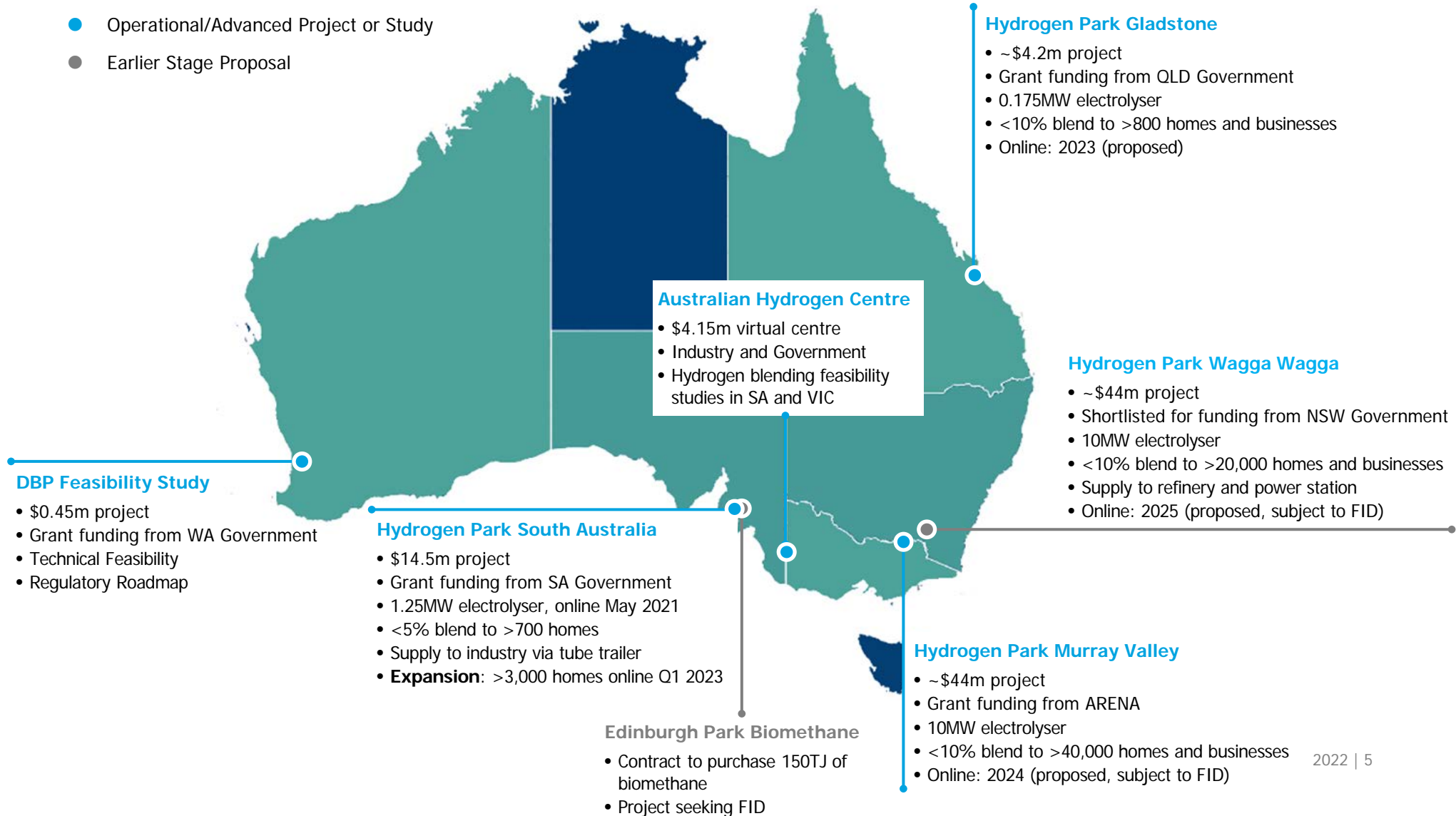
Stretch and  
2050 Latest

100% renewables in distribution,  
Net zero in transmission, midstream



# Delivering the Vision | Delivering Projects Across the Country

- Operational/Advanced Project or Study
- Earlier Stage Proposal



# Delivering the Vision | Research



## Australian Hydrogen Centre

Founding members:



**ARENA**



Government of South Australia  
Department for Energy and Mining



**NEOEN**



# Network Analysis | SA and Vic Distribution Networks

## Pipe compatibility

- Licensed pipelines
- Distribution piping

## Component compatibility

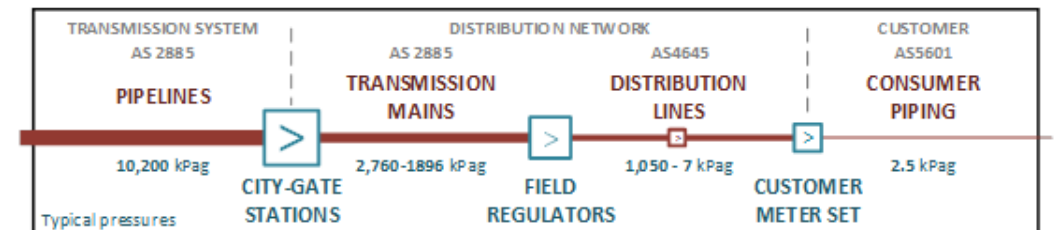
## Operations and maintenance impacts

## Customer piping compatibility

# Network Analysis | SA and Vic Distribution Networks

## Licensed pipelines

- AS 2885, B31.12, first principles research
  - Pipelines with approved materials and low design factor accepted for use
  - Pipelines with a design factor above 0.3 need further assessment to approve (SMS).
  - Pipelines made from non-approved materials need material testing.





# Network Analysis | SA and Vic Distribution Networks

## Distribution piping

- AS 4645

- Plastic, steel, copper, acceptable for transporting 10% & 100% hydrogen.
- Cast iron should not be used above 7kPA
- All joint types are suitable for 10% Hydrogen, and most joint types are suitable for 100% hydrogen.



# Network Analysis | SA and Vic Distribution Networks

## Component compatibility

- Database of components (type, brand, model) and their materials
- Material compatibility guideline from literature review
  - Most existing components are compatible with Hydrogen
  - Components with cast iron (>7kPa), nickel alloys, martensitic stainless steel to be assessed
  - Displacement Meters are compatible with 10%, but require replacement with higher capacity at 100%



# Network Analysis | SA and Vic Distribution Networks

## Operational Processes

- Process conditions (HAZOP guidewords)
- Loss of Containment
- Operator activities
  - Control of ignition sources (purgings, leaks)
  - Live welding
  - Hazardous area sizing
  - HA rating of equipment
  - Gas detection



# Network Analysis | SA and Vic Distribution Networks

## Customer piping

- AS 5601.1

- Materials accepted
- Conduct leak tests and review line sizing when commissioning a domestic connection
- Replacement of appliances at 100%



# Network Analysis | SA and Vic Distribution Networks

## SUMMARY

- Available knowledge is sufficient to make solid findings
- 10% hydrogen blend requires minimal changes
- Transition to 100% should be low complexity

