Delivering the next level of Future Fuels research to develop our industry

APGA Convention – September 2022

Today's presenter

David Norman
CEO
Future Fuels Cooperative Research Centre

Welcome

Today's presentation:

- **Hydrogen and biomethane – now over 100 real-life projects**
- **Pipeline industry is a key driver of this nascent industry**
- **With scale comes the need for more new engineering knowledge and a better understanding of our communities and customers**
- **Next generation of research to enable the industry to delivering increasingly large and effective projects.**

About Future Fuels Cooperative Research Centre

Long term, industry-led collaboration between 100 industry, all State governments and six academic organisations, co-funded by the National Government

FUTURE FUELS CRC

Action orientated, industry led, applied research

Trusted voice of evidenced-based knowledge

100 projects and over 50 PhD scholarships covering:

- **Future Fuel Technologies, Systems and Markets**
- **Social Acceptance, Public Safety, Security of Supply and Policy & Regulatory Changes**
- **Network Lifecycle Management**

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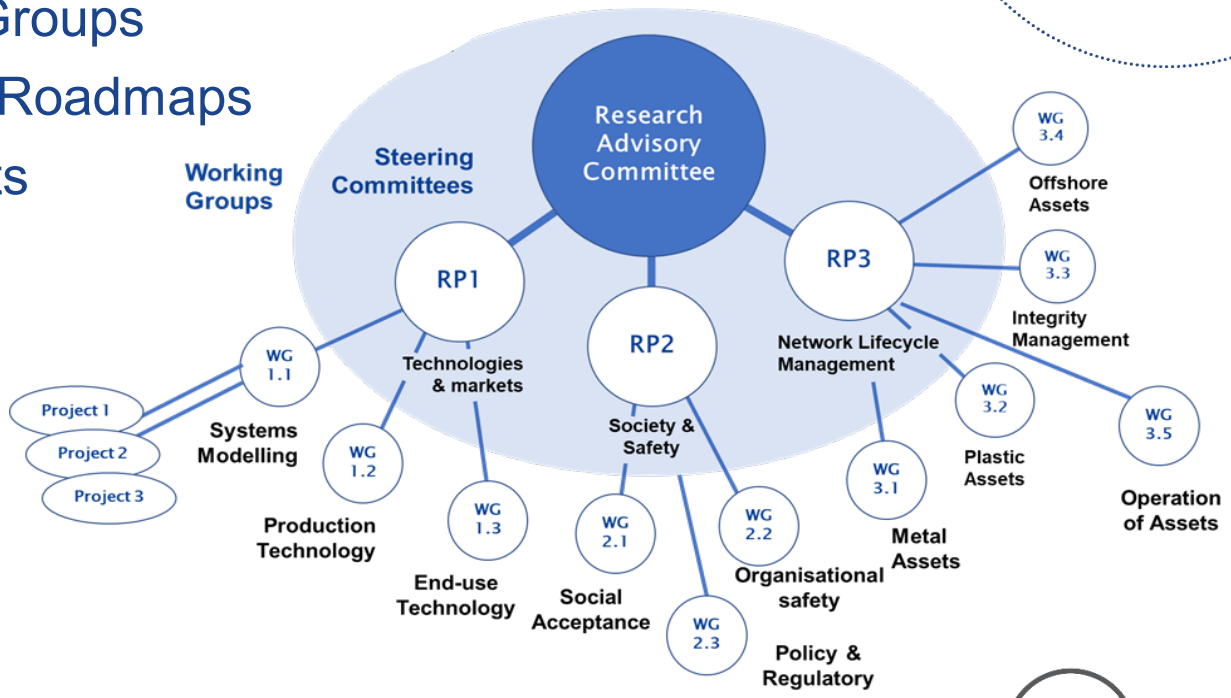
Research Management Structure

10 Focused Working Groups

10 Detailed Research Roadmaps

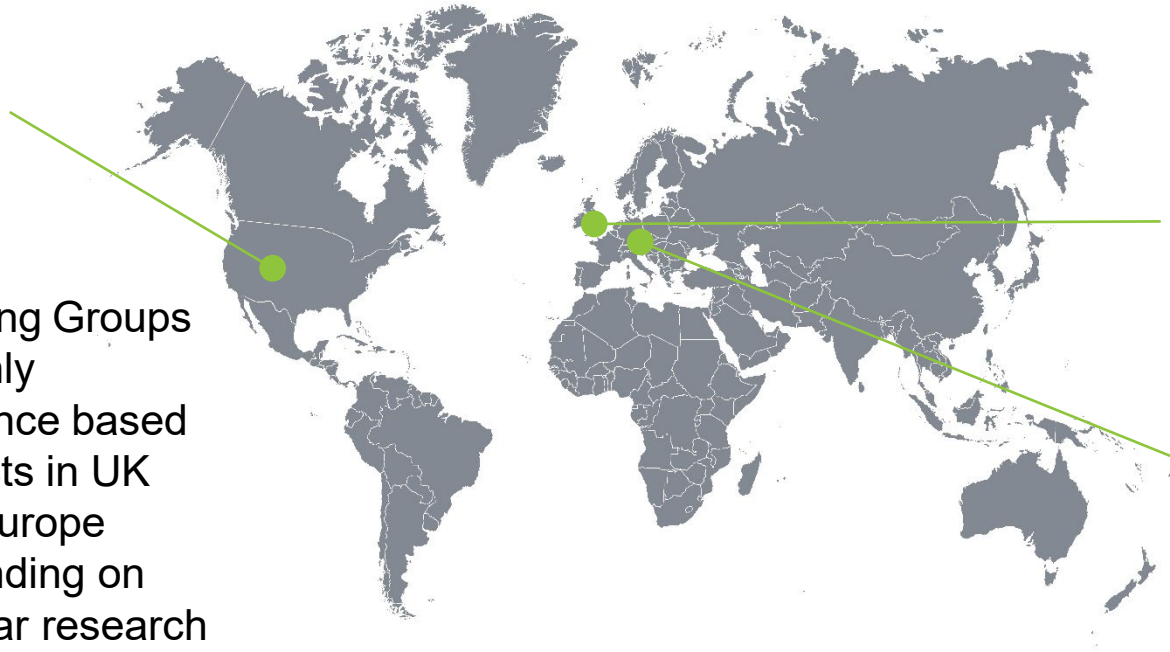
210 Industry Specialists

150 Researchers



Our regular international linkages

with other infrastructure related research organisations



- Working Groups monthly
- Evidence based projects in UK and Europe
- Expanding on 20-year research relationships

PRCI

IGEM Institution of Gas Engineers & Managers

nationalgrid Northern Gas Networks

EPRG

GERG THE EUROPEAN GAS RESEARCH GROUP

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Steels research progressing at pace

- Hydrogen embrittlement,
- Tensile strain
- Fracture initiation and propagation
- APA Parmelia Gas Pipeline
- Hydrogen Pipeline Code of Practice

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Steels: tensile testing in hydrogen

- SafeTi Lab at the University of Wollongong
- Overseas Labs now with years of testing backlog
- Crucial to ASME B31-12 Option B pathways

Appliances: industrial and residential

Industrial Burner on Natural Gas and 95% Hydrogen

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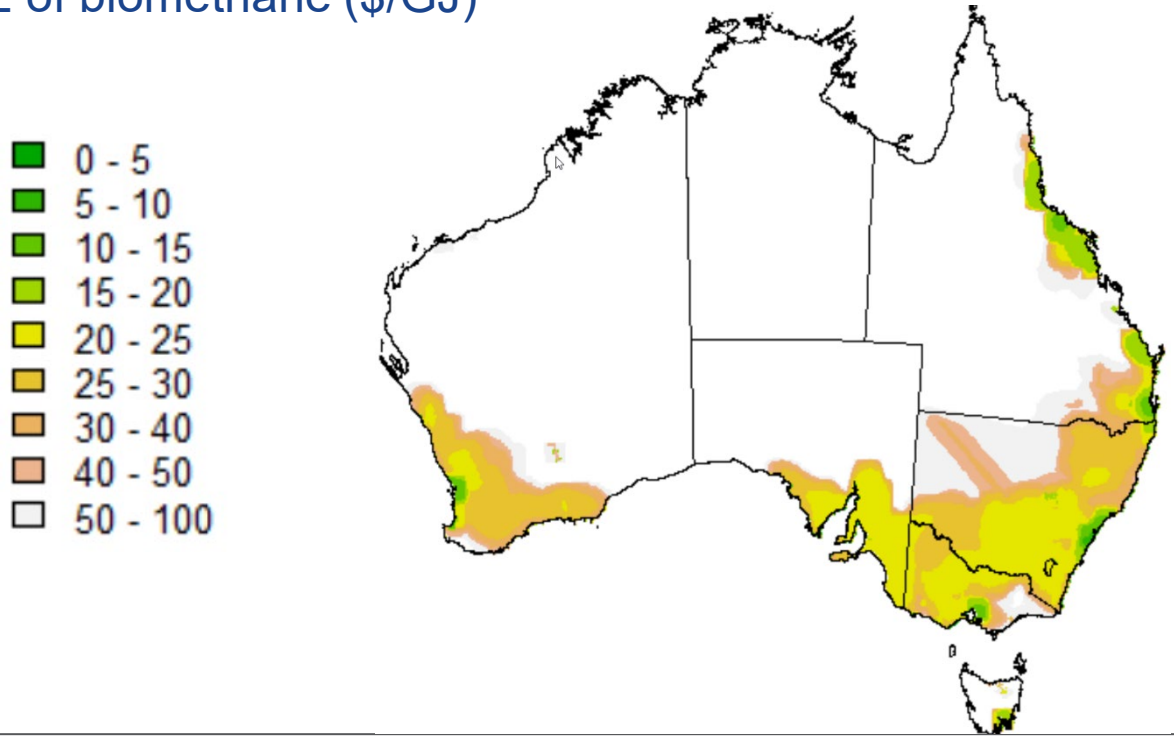
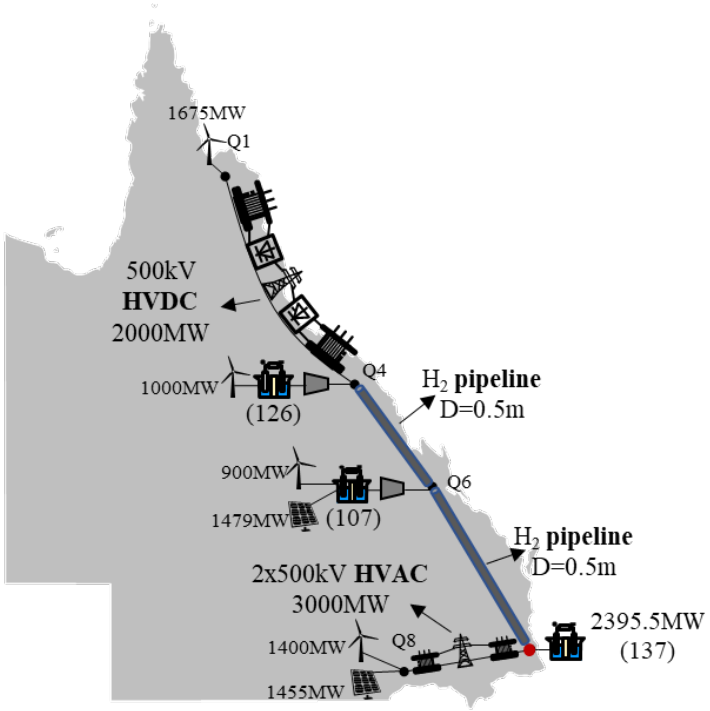
Understanding social license

Building biomethane viability

LCOE of biomethane ($/GJ)



Techno economics – Integrated Systems Thinking



Designing cost-effective infrastructure to address key issues:

- VRE hubs and electrolysers co-located?
- Transport electricity or molecules?

Long duration, large scale, inter-seasonal, underground H2 storage

Interim findings from a groundbreaking study

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NET ZERO AUSTRALIA

Silver Sponsor

THE UNIVERSITY OF MELBOURNE

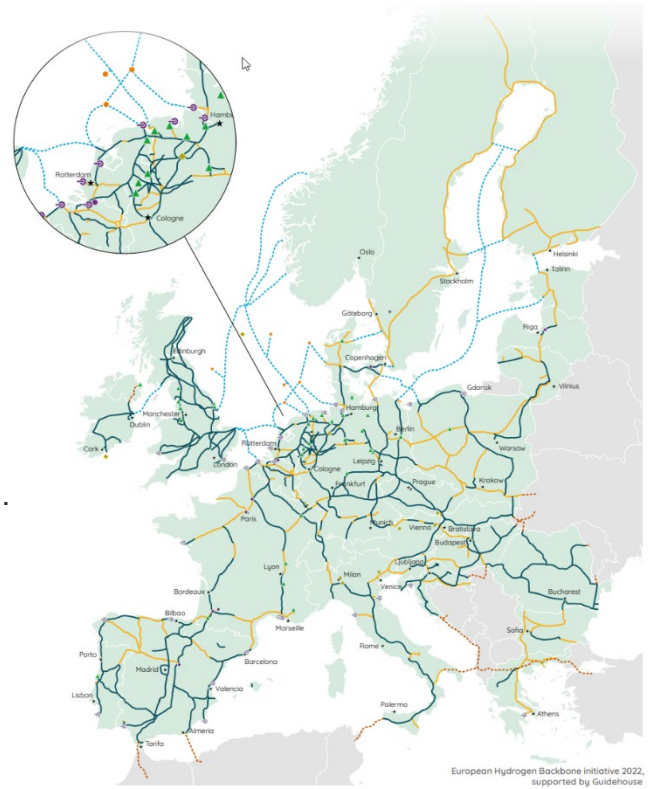
THE UNIVERSITY OF QUEENSLAND AUSTRALIA CREATE CHANGE

PRINCETON UNIVERSITY

nous

https://www.netzeroaustralia.net.au/

European Hydrogen Backbone and REPowerEU targets



European Commission

Fit for 55 H2 Target was previously less than 5 MTpa in 2030.

REPowerEU sets a target of 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of renewable hydrogen imports by 2030.

Boosting sustainable biomethane production to 35 bcm by 2030, needing EUR 37 billon euro over the period.

Source https://ehb.eu/

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New Entity

Operating Activities

- Collaborative Research
- Contract Research
- Advisory Services
- Education & Training
- New Ventures

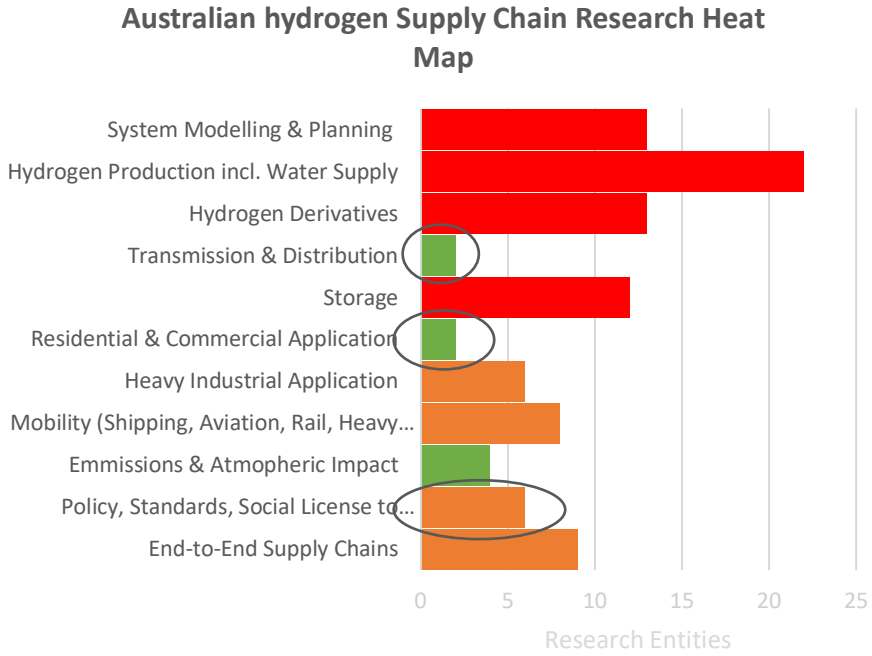
Managed by

- Secretariat

Supported by

- R&D Testing CoE
  - H2Safe(TI) Lab – Steel
  - H2Safe(TI) Lab – Full Scale Pipe Fracture
  - H2Safe(TI) Lab – Polymer
  - H2Safe(TI) Lab – Appliances

Hydrogen Supply Chain Research Intensity



FFCRC is almost the sole entity enabling research in hydrogen in the transmission and distribution network and in residential and commercial applications.

Source Data: HyResearch

Developing and Validating the Research Program

Gas Vision 2050 Identified Actions	Consumer Engagement Technical/Environmental/Economic Regulation	Security of Supply Connecting a diverse range of biomethane producers to the network Joint Planning Renewable Gas Target	Bio & Renewable methane – quality specifications Hydrogen Safety – Distribution and Transmission Networks Hydrogen Appliance - Testing	Hydrogen Appliance - Development
New Entity Research Programs	**Engagement Training & Trusted Advice**	**System Modelling and Multi-level planning**	**Testing, Demonstration and Advanced Engineering**	**Enabling Technology Research & Development**

- Initial list of projects (80+) has been identified by FFCRC through Research Roadmaps, Working Groups and Steering Committees.
- List has been circulated to industry proponents and feedback has been received regarding level of interest/need and priority.
- Project proposals and budgets are currently being development for research projects with M/H level of interest/needs by industry

Red/Amber/Green boxes indicate progress as identified in Gas Vision 2050 Update – April 2022

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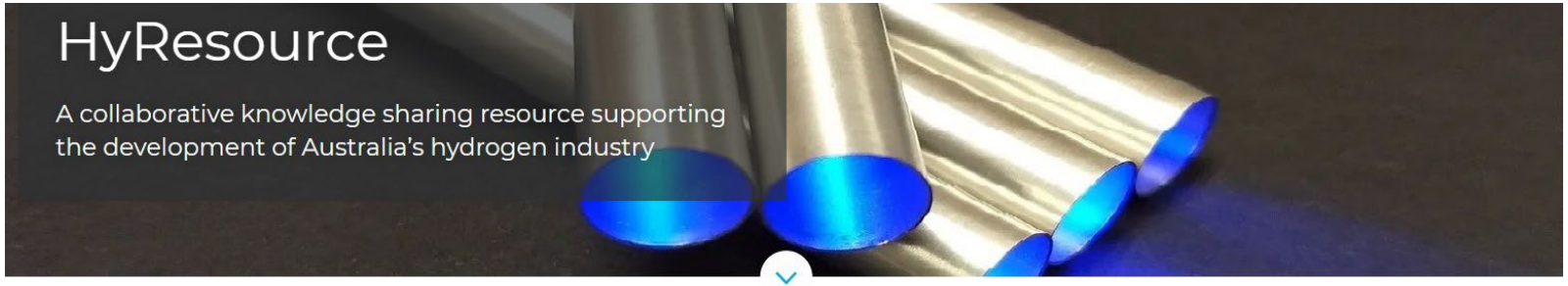
HyResource is following hydrogen projects and R&D



Find out more at https://research.csiro.au/hyresource

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Enabling the decarbonisation of Australia's energy networks

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