HUNTER HYDROGEN ROADMAP

Hunter iF lunch 23 November

Panel Discussion

With proud sponsor

PORT of NEWCASTLE

WHY HYDROGEN?

What's all the hype?

- State and national strategies for hydrogen
- Public and private investment hunting for partners and projects
- Delivering on domestic and international Net Zero commitments
- Competitive positioning in the emerging low carbon economy
- Opportunities for jobs and economic growth

A UNIFIED VOICE FOR THE HUNTER

COMMITTEE FOR THE HUNTER

WHY THE HUNTER?

Because we already have a head start….

- Essential pillar in our region's economic diversification
- Leverages our economic strengths, existing infrastructure and workforce
- Centre for collaborative research and innovation in energy
- Connections with global energy trading partners
- Australia's energy and low carbon transformation relies on the Hunter
- Aligned with identity and positioning needed for the region to compete in the low carbon world
- A shared vision to lead the hydrogen economy and working collaboratively to achieve it

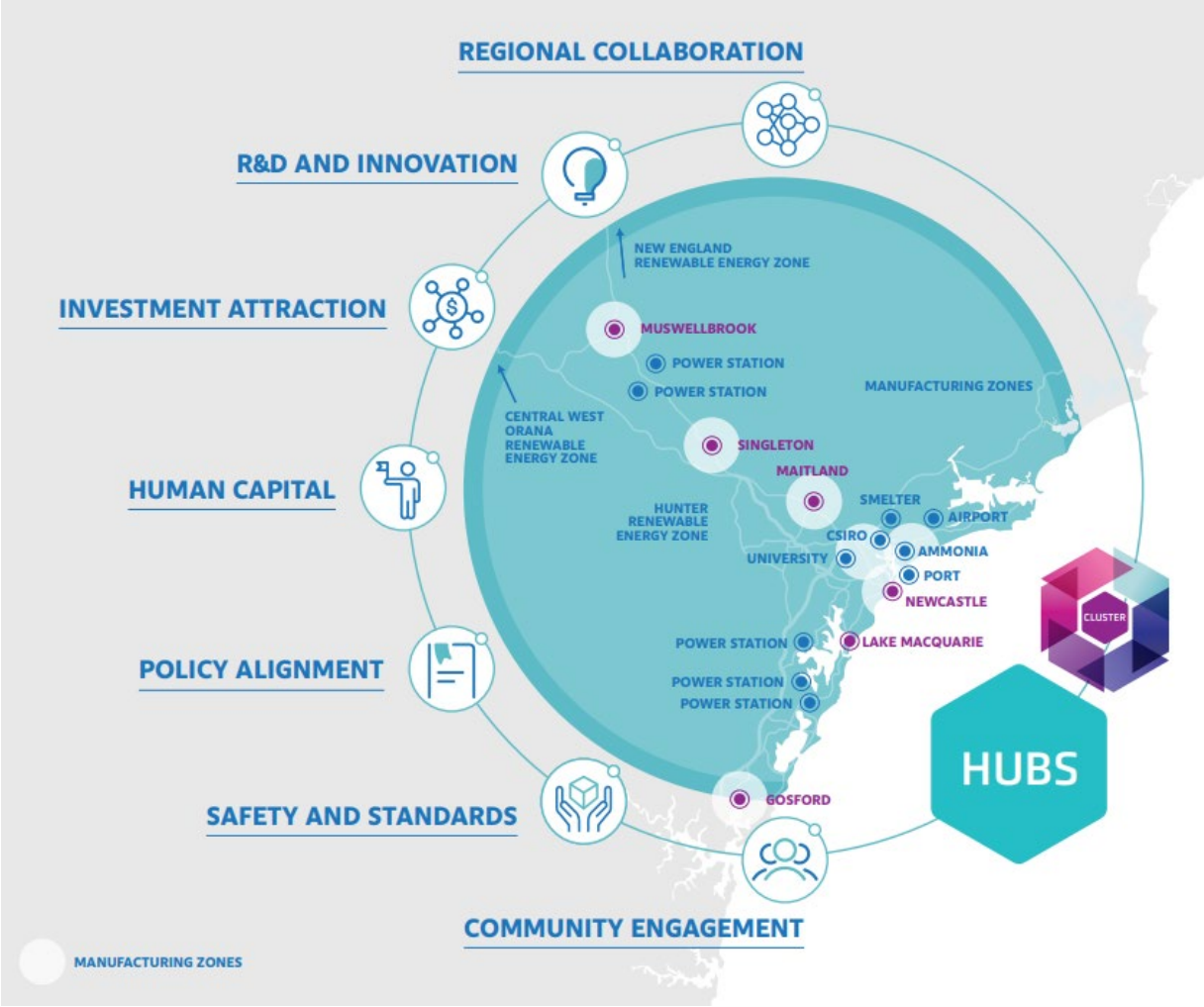
ABOUT THE ROADMAP

- Promotes the Hunter's hydrogen capabilities
- Outlines a shared vision for the development of hydrogen in the region
- Sequences key actions and investments – across sectors and the region – to get there
- Coordinates initiatives in a place-based strategy for growth
- Looks beyond projects and technology to the fundamentals that make us competitive
- Expression of the Hunter's culture of collaboration, ambition and 'can do'

A UNIFIED VOICE
FOR THE HUNTER

COMMITTEE FOR THE HUNTER

THE VISION



The Hunter will be **Australia's leading hydrogen hub and technology cluster** across the hydrogen supply chain, demonstrated by:

- Excellence in research
- Innovation
- Technology and education
- Production
- Use
- Export
- Employment participation

PREPARE AND PILOT 2021 – 2025

Establish pilot and demonstration projects

Investment: (<$150M)

VISION

The Hunter region has **prepared the market** and is **recognised as a hydrogen hub and cluster** underpinned by its reputation in industry collaboration, research excellence and innovation. The region will have demonstrated that it is an **attractive location to pilot and invest in hydrogen** production, technologies and applications such as hydrogen fuel cell buses, trucks, cars, ferries, rail, P2X solutions and injection into natural gas pipelines

TARGET APPLICATIONS AND USE CASES

Pilot and Demonstration Projects

Including mobility applications, remote area power systems, ammonia production, natural gas blending and chemical feedstock applications.

Feasibility Studies

To inform development and delivery options for larger scale electrolyser and export projects.

Hunter Hydrogen Hub

Promote and broker demand and supply opportunities to attract investment, reduce project risks and costs through coordination and economies of scale.

Industry and Workforce

Map and benchmark industry and workforce preparedness, identifying development needs, new career pathways and training facilities.

COMMITTEE FOR THE HUNTER

PREPARE AND PILOT 2021 – 2025

Strategic enablers

- **Roadmap delivery and oversight**
- **Investment attraction**
  - Hunter Hydrogen Ambassador
  - Investment concierge
  - Brand and narrative
- **Human capital**
  - Workforce and skills assessment
  - Develop new educational pathways/facilities
  - Scope testing and training centre
- **Community engagement**
  - Targeted consultation with emergency first respondents
  - Education campaign
- **R&D**
  - Research: MoUs; HyRIF Stage 1; Hydrogen and HETS Doctoral Training Centre
  - Map demand and assess infrastructure
  - Mission-based challenge series
  - Scope start- and scale-up accelerator
- **Policy and regulation**
  - Est. requirements of hydrogen certification scheme
  - Inform development of standards, safety and support industry uptake
  - Advocacy – supportive/coordinated policy environment, effective and efficient regulation

A UNIFIED VOICE FOR THE HUNTER

COMMITTEE FOR THE HUNTER

DEPLOY AND SCALE 2025 – 2035

STAGE 1

Hydrogen Production from:
100 MW + Electrolyser

Investment:
($150M+)

TARGET APPLICATIONS AND USE CASES

Chemical Feedstock

Commence feasibility for green hydrogen as a feedstock for industrial production including ammonia and fertiliser manufacturing.

Gas Networks

Commence feasibility to blend with natural gas for industrial use. Pilot blending of green Hydrogen from 5% to 10% into existing pipeline infrastructure.

Power Generation and Regional Opportunities

Explore and pilot remote power generation applications as a substitute to diesel.

Fuels and Mobility

Commence building "Back to Base" Green Hydrogen production and refueling infrastructure. Pilot supply applications include forklifts, public transport, heavy vehicles, and rail.

VISION

The Hunter has **deployed and scaled hydrogen production** and a growing group of dynamic **industries are confident in the use** of hydrogen as feedstock for domestic use. A broad suite of applications could include green ammonia, fertilisers, steel, aluminium. The region will have **advanced international export relationships** and opportunities to meet the markets from countries, committed to Green Hydrogen such as Japan, Korea, Singapore, Germany and China

DEPLOY AND SCALE 2025 – 2035

STAGE 2

Hydrogen Production from:
1 GW + Electrolyser

Investment:
($1bn+)

TARGET APPLICATIONS AND USE CASES

Heavy Industry

Decarbonisation of heavy industry and manufacturing including production of locally produced green aluminium through firmed renewable electricity.

Direct use of hydrogen either as a heat source or a reductant or in ammonia and fertiliser production, industry and manufacturing.

Transport and Mobility

Expand on the Stage 1 initiatives to include shipping and additional mobility operations at the Port of Newcastle. This could include ferries, tugs, dredging equipment.

Work with ship manufacturers to develop a ammonia and/or methanol fuel based engine for the industry.

Leverage international partnerships to enable hydrogen passenger fuel cell for train services.

Collaborate with the Hunter's existing logistics operators utilising industrial transport corridors and networks to provide extensive pathways and infrastructure for transportation of large mass, high mileage vehicles.

Chemical Feedstock

P2X applications including aviation fuels, biomethane production from domestic and commercial waste converting directly to hydrogen.

PROSPER
2035+

Hydrogen Production from:
5GW + Electrolyser

Investment:
(Approx $2.5bn+)

VISION

The **thriving hydrogen economy** of the Hunter region is providing **jobs** to thousands of skilled workers, including **zero emissions equipment manufacturing and industry**. The region will have achieved an enviable reputation as an international **exporter of hydrogen**, and hydrogen equipment, technology and services (**HETS**) to a global market. **Assured under a Guarantee of Origin Scheme**, the Hunter region will be known for reliable and quality green hydrogen supply, underpinned by a specialised HETS sector that is **globally recognised.**

TARGET APPLICATIONS AND USE CASES

Technology Scaleup

Scaling up the activities underway with view towards regional economic objectives including exports of green ammonia, liquid hydrogen, fertilisers, and other green hydrogen derivatives to key markets.

Green Steel Manufacturing

Supported by large-scale renewable energy, reduced electrolyser costs and low-cost hydrogen distribution and storage enable a large domestic and export-scale, green steel manufacturing industry.

Power Generation and Regional Opportunities

Production of renewable hydrogen close to the sources of solar, wind and potentially pumped hydro and transport via the construction of pipelines to the Port of Newcastle for export in various forms namely liquefied state, ammonia and other derivatives.

Hydrogen as stored energy for power generation and electricity grid balancing services.

Piped hydrogen to other areas in the State with offtake spurs.

Chemical Feedstock

Diverse P2X applications including aviation fuels, biomethane production from domestic and commercial waste converting directly to hydrogen.

COMMITTEE FOR THE HUNTER

ROADMAP DELIVERY PARTNERS

First steps towards big strides

- The Hunter Hydrogen Roadmap was developed by the **Hunter Hydrogen Taskforce** on behalf of the Committee for the Hunter
- The Committee will coordinate the Roadmap's implementation

We acknowledge the Vice-Chancellor of University of Newcastle, Alex Zelinksy in providing the leadership and resourcing to deliver this important strategy for the Hunter

Hunter Hydrogen Taskforce members:

Ampcontrol
CSIRO
Committee for the Hunter
Dantia
Grattan Institute
H2 NOW (Alex Dronoff)
HunterNet
Ironbark (Clark Butler)
Newcastle Institute for Energy and Resources
Port of Newcastle
University of Newcastle

A UNIFIED VOICE FOR THE HUNTER

COMMITTEE FOR THE HUNTER

PANEL DISCUSSION + Q&A

Hunter Hydrogen Taskforce co-contributors

Simon Byrnes - Chief Commercial Officer, Port of Newcastle

Alex Dronoff - CEO, Fichtner Australia and New Zealand

Clare Sykes – Hunter Hydrogen Cluster Manager, New H2

Behdad Moghtaderi - Director; Priority Research Center for Frontier Energy Technologies and Utilisation, University of Newcastle

A UNIFIED VOICE FOR THE HUNTER

COMMITTEE FOR THE HUNTER

FIND OUT MORE
GET INVOLVED

Hunter Hydrogen Roadmap https://hunter.org.au/what-we-do/hunter-hydrogen-roadmap/

Alice Thompson
0490 688 125
ceo@hunter.org.au

Thank you to our sponsor