

NSW Hydrogen Strategy

Wagga Energy and Innovation Conference

Rebecca Dunn, PhD

Senior Project Officer, Hydrogen Programs

Acknowledgment of Country

We acknowledge that Aboriginal and Torres Strait Islander peoples are the First Peoples and Traditional Custodians of Australia, and the oldest continuing culture in human history. We pay respect to Elders past and present and commit to respecting the lands we walk on, and the communities we walk with.

Artwork:

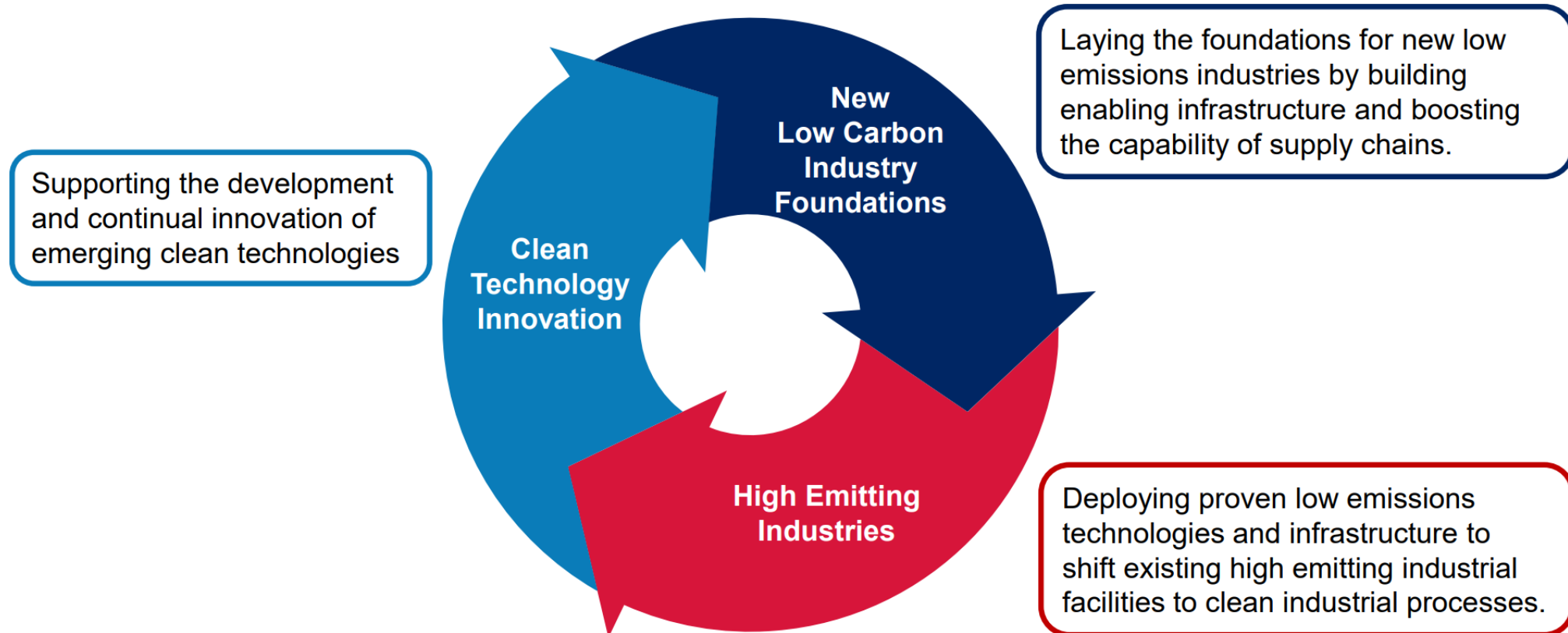
Regeneration by Josie Rose



- **11.50 – 12.20** **Mark Caddey**, Net Zero Land Program
- **1.20 – 1.50** **Simon Wallace-Pannell**, The Joint Organisations Net Zero Acceleration (JONZA) Grant Program
- **3.10 – 3.20** **Dan Wigmore**, Net Zero Transport Initiatives

Net Zero Industry and Innovation Program

More than \$1 billion to support and partner with industry to move towards net zero.



NSW Hydrogen Strategy Overview



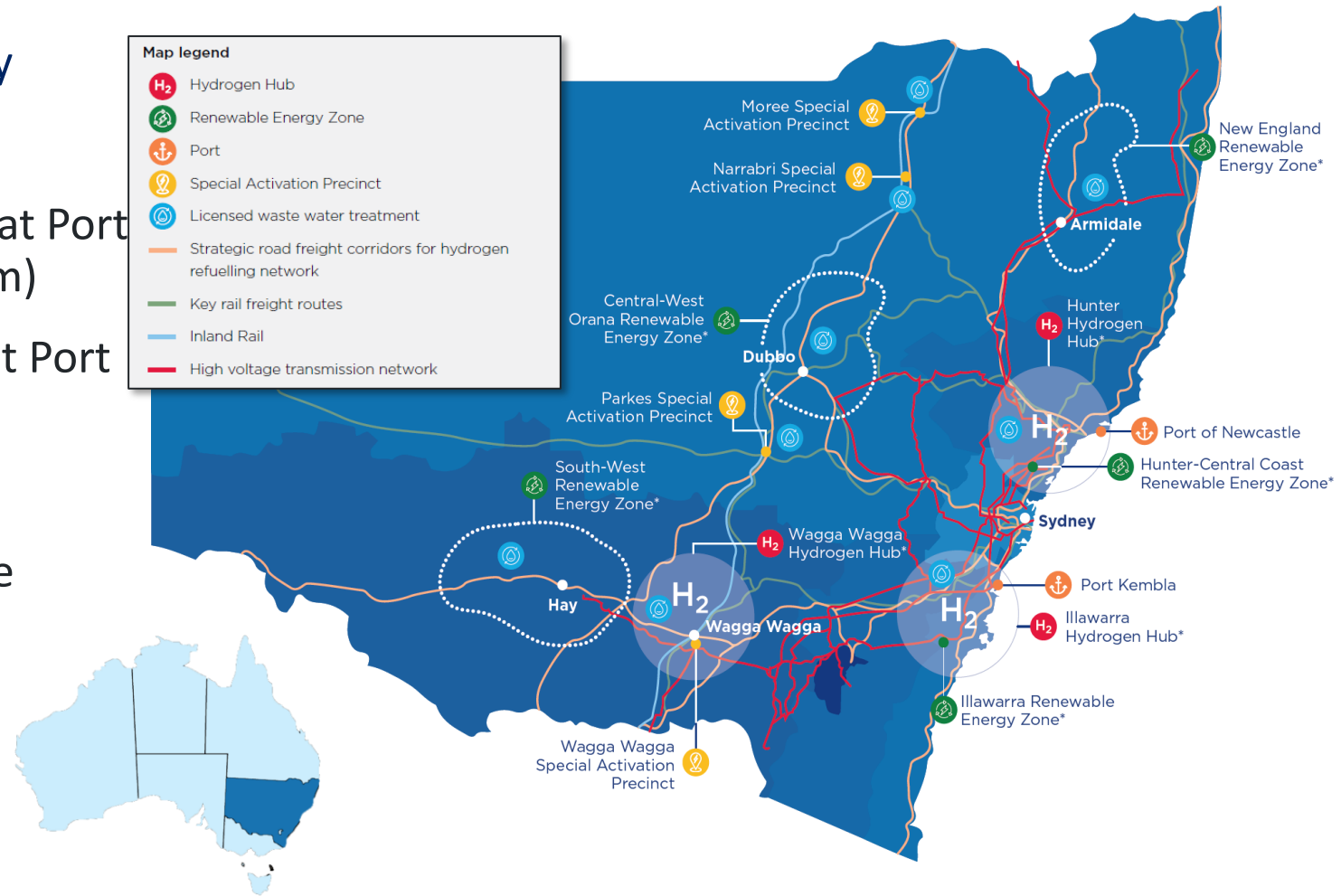
- NSW Hydrogen Strategy Vision
- Initiatives and Incentives
- Regional Actions
- Highlights for Other Actions

NSW Hydrogen Strategy Vision

NSW at a glance

Prime conditions for green hydrogen industry

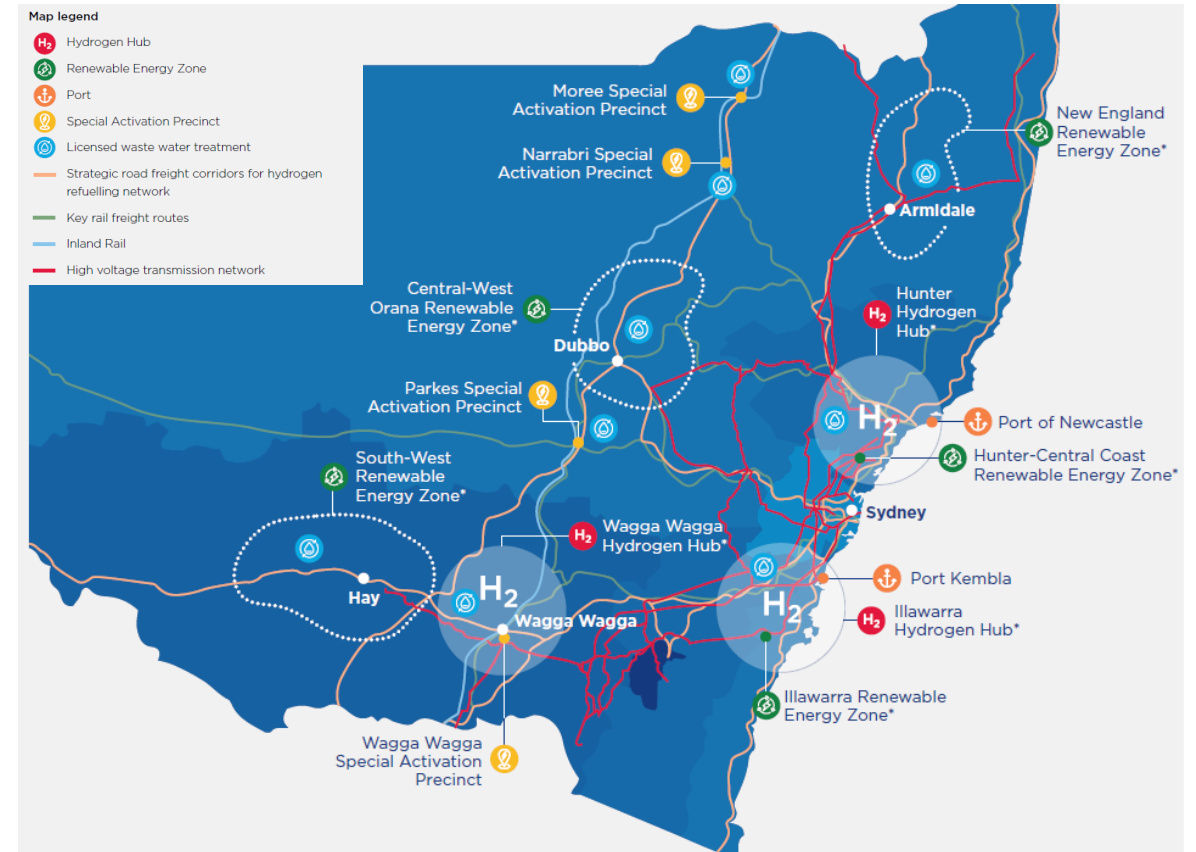
- Australia's largest population by state
- Existing ammonia production and export at Port of Newcastle (~360,000 tonnes per annum)
- Australia's largest integrated steelworks at Port Kembla (~3 million tonnes per annum)
- Abundant renewable energy resources
- Home to Australia's three major interstate highways



Vision for a NSW hydrogen industry

2030 stretch targets

H₂	Green hydrogen produced 110,000 tonnes per annum		Renewable energy capacity 12 GW
	Electrolyser capacity 700 MW		Hydrogen price Under \$AU2.80 per kg
	Hydrogen vehicles 10,000		Refuelling stations 100
	Gas network blending 10% (by volume)		NSW Government heavy vehicle fleet 20% hydrogen vehicles

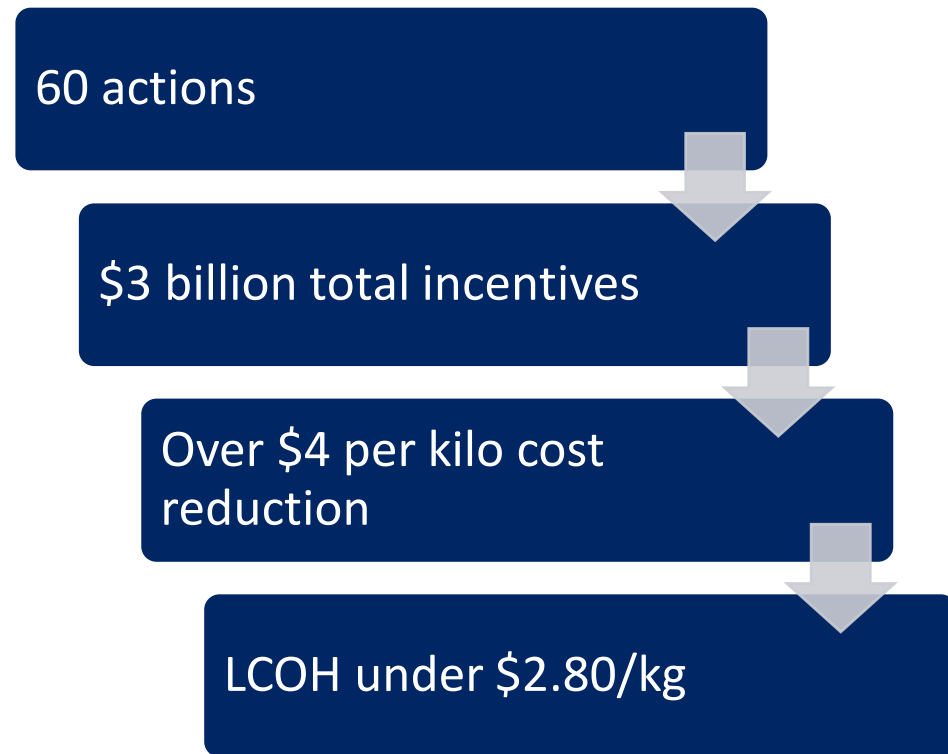


NSW Hydrogen Strategy – Our plan to realise the hydrogen opportunity



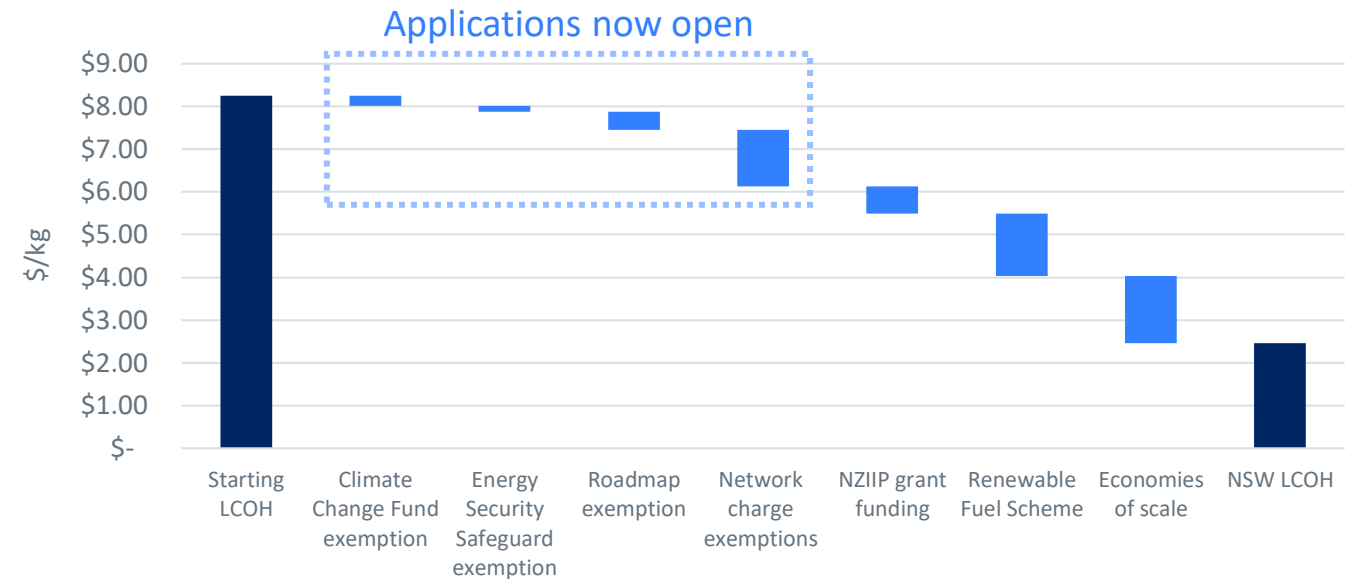
NSW Hydrogen Strategy

Our state's plan to become a hydrogen superpower.



Overcoming the key barrier to investment - COST

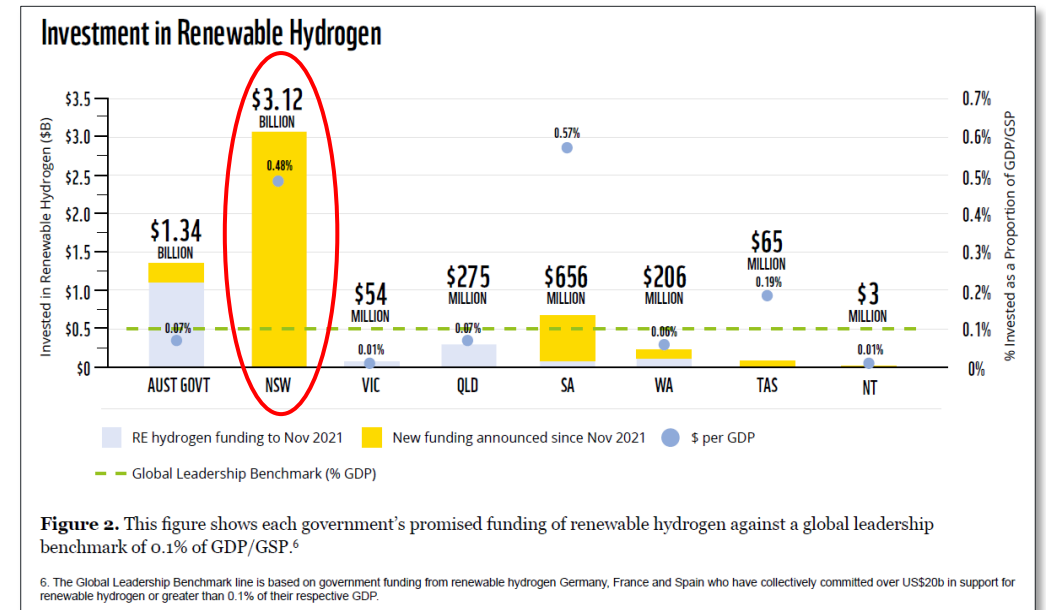
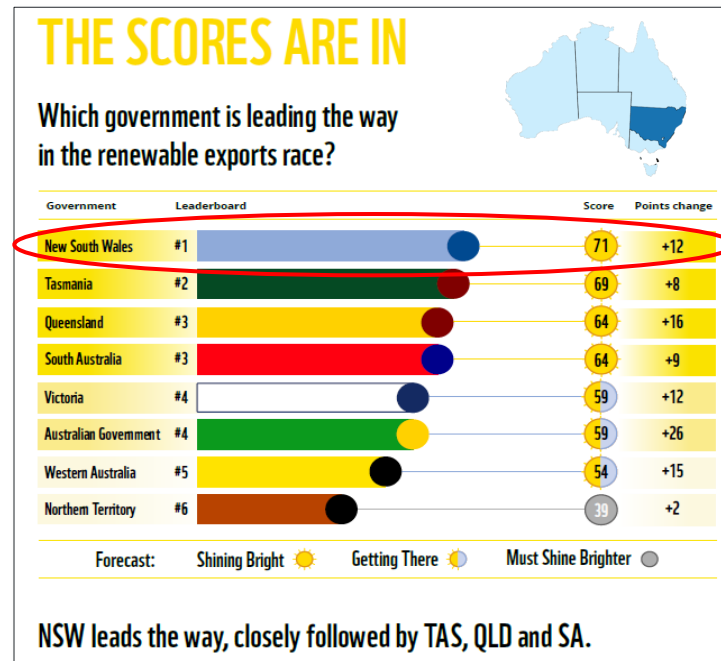
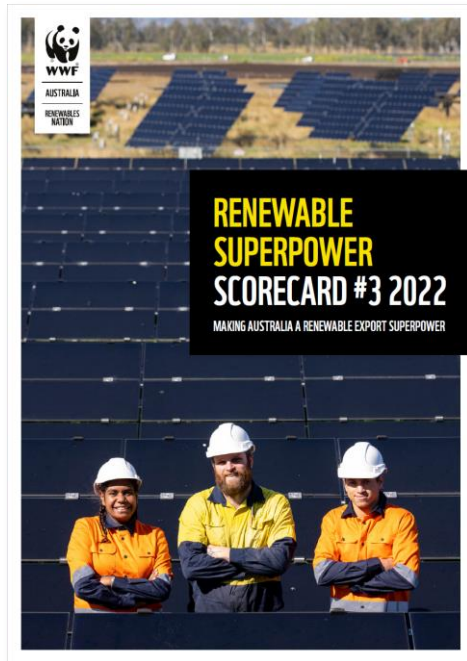
\$3 billion in incentives to reduce the cost of green hydrogen by \$4 per kilo.



NSW, leading Australia to Net Zero

Independent conservation organization, WWF Australia, 2022 Renewable Superpower Scorecard.

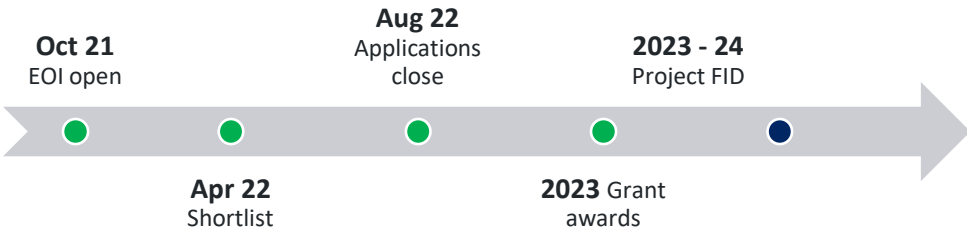
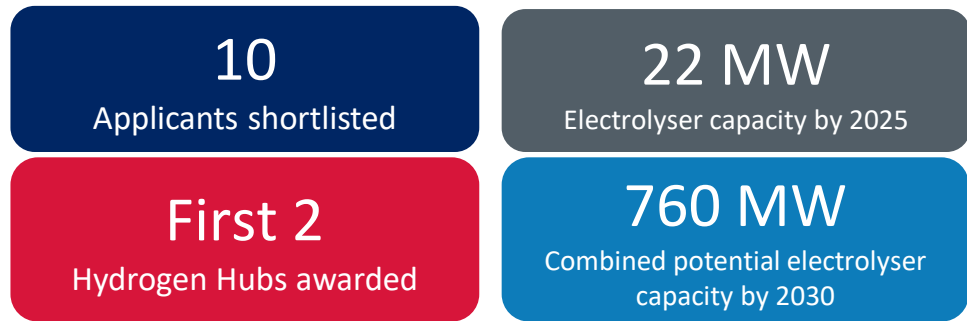
NSW ranked first nationally in the transition to renewables and leads globally in hydrogen investment.



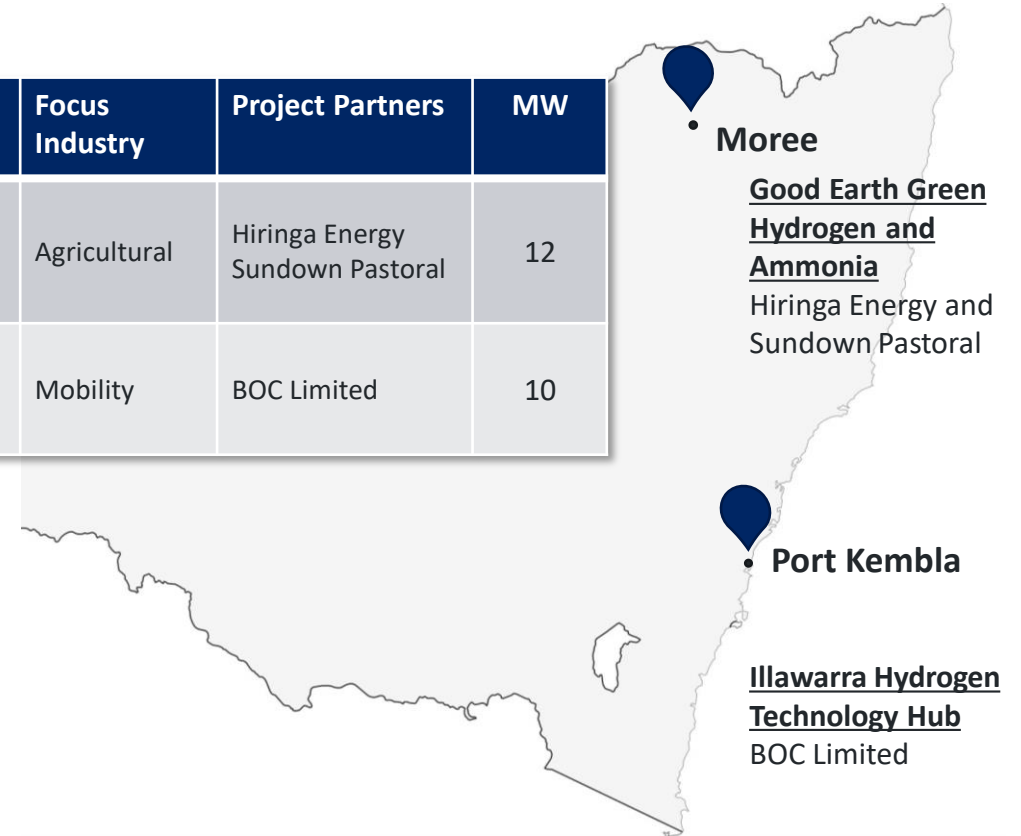
Initiatives and Incentives

Action 4 – Hydrogen Hub initiative

Up to \$150 million Hydrogen Hub Initiative



Location	Focus Industry	Project Partners	MW
Moree	Agricultural	Hiringa Energy Sundown Pastoral	12
Illawarra	Mobility	BOC Limited	10



Good Earth Green Hydrogen and Ammonia

Joint project between Hiringa Energy and Sundown

Co-located with Sundown's Keytah cotton farm near Moree within the Gwydir Valley.

- The Gwydir Valley is a key cotton producing region and produces more than 50% of NSW cotton.
- The project is replicable model for commercial green ammonia production and overcomes crucial technical, commercial and operational barriers towards regional uptake of green hydrogen
- The Project will have an ammonia plant to convert green hydrogen feedstock and air captured nitrogen into green ammonia and will include associated offtake facilities for green hydrogen and ammonia.

Initial Phase

10t

Ammonia per day

12MW

Electrolyser capacity

91

NSW Jobs

Project Aims

112MW

Electrolyser capacity



• Moree

Good Earth Green Hydrogen and Ammonia
Hiringa Energy and Sundown
Pastoral



Illawarra Hydrogen Technology Hub



Project lead, BOC Limited

Located in Port Kembla.

- The project will supply green hydrogen to hydrogen refuelling stations for mobility, with capacity to power up to 40 heavy vehicles a day.
- Future developments will expand supply to decarbonise steel, glass, and cement production

Initial Phase

4t

Renewable hydrogen produced per day

10MW

Electrolyser capacity

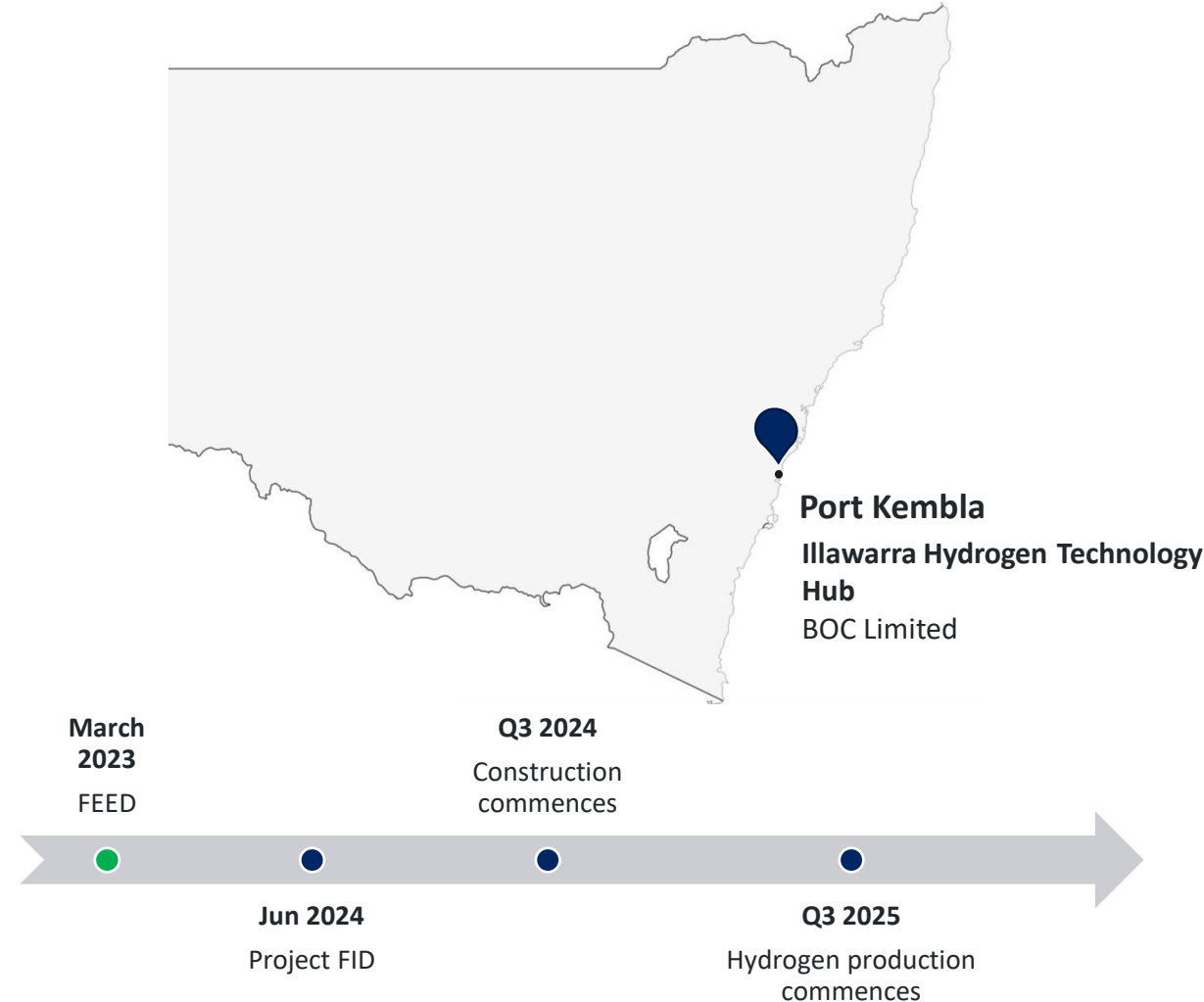
110

NSW Jobs

Project Aims

650MW

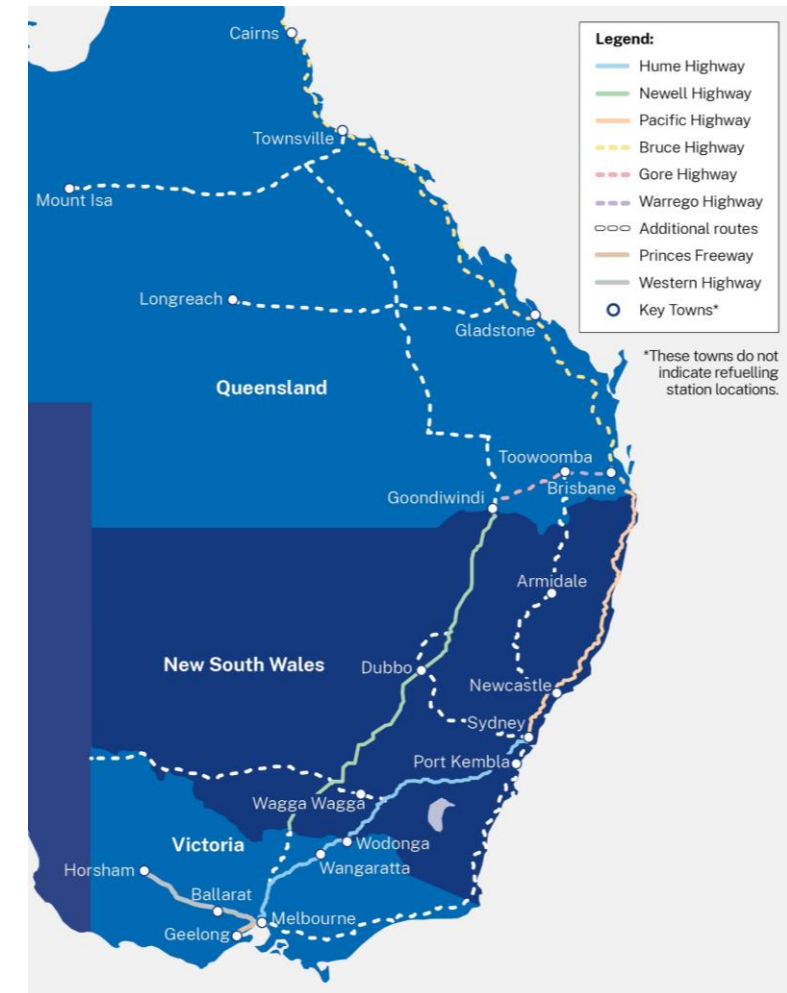
Electrolyser capacity



East Coast Hydrogen Refuelling Network

In March 2022, the governments of NSW, Victoria and Queensland signed a Memorandum of Understanding for an east coast hydrogen refuelling network.

- Starting with hydrogen refuelling corridors along the Hume Highway, Pacific Highway and Newell Highway
- Connecting Melbourne, Sydney and Brisbane
- Targeting 2026 for deployment of infrastructure along these routes.



Action 30 – Hume Hydrogen Highway

\$20M Hume Hydrogen Highway

The Hume Highway, Australia’s most trafficked freight route, will establish the beginning of the east coast hydrogen refuelling network

4

hydrogen refuelling stations

25

hydrogen-powered trucks

- \$20 million competitive grants program, co-funded by NSW and Victorian State Governments
- Funding support available for hydrogen refuelling stations and hydrogen trucks to operate the Sydney to Melbourne freight corridor
- Demonstrating a decarbonisation pathway for the freight and logistics sector

Short Term

Grant funding support to deliver at least 4 hydrogen refuelling stations and approximately 25 hydrogen trucks

Mid Term

Self-sufficient, open access hydrogen refuelling network providing full coverage for freight vehicles travelling between Sydney and Melbourne

Long Term

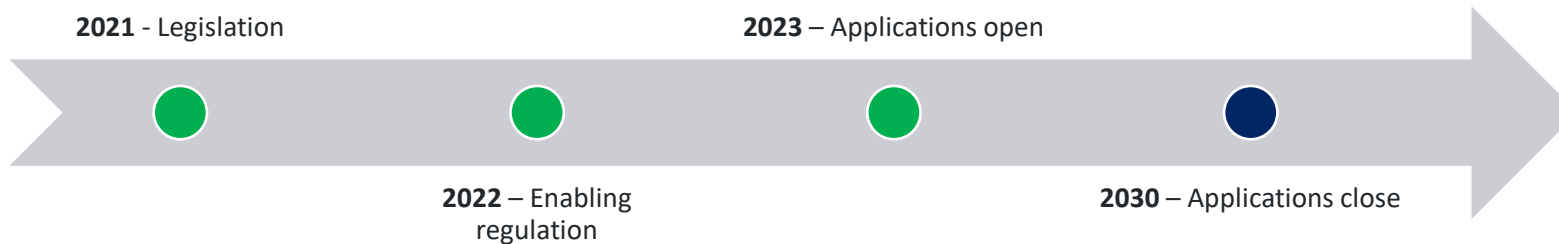
Expand into an east coast interconnected hydrogen refuelling network (QLD, VIC, NSW MOU)
Freight sector transitioning to net zero



Action 8 – Exemptions to network and scheme charges

Australian first – **over \$2/kg reduction** to cost of hydrogen through exemptions to network and scheme charges

- **Applications now open**
- Network charges - 90% discount
- Electricity schemes - 90-100% exemption (e.g. Energy Savings Scheme)
- Apply during project development to help reach FID



90%

Discount on network use of system charges

Available for the first

750MW

installed by 2030

For a period of

12 years

90-100%

Electricity scheme exemptions

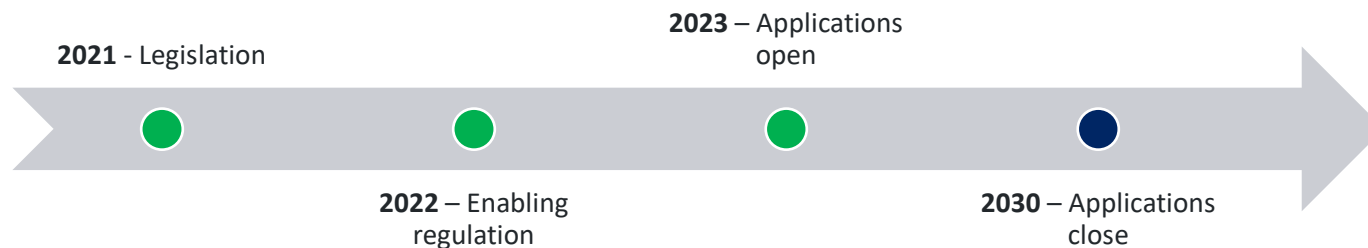
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Australian first – **over \$2/kg reduction** to cost of hydrogen through exemptions to network and scheme charges

- Only in areas with existing spare capacity
- 1 MW minimum demand threshold
- Exempted from National GreenPower Program accreditation fees
- Exemptions to Climate Change Fund, Energy Savings Scheme, Peak Demand Reduction Scheme and Electricity Infrastructure Roadmap costs

Applications

- Currently open at www.energy.nsw.gov.au



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Exemption from network use of system charges

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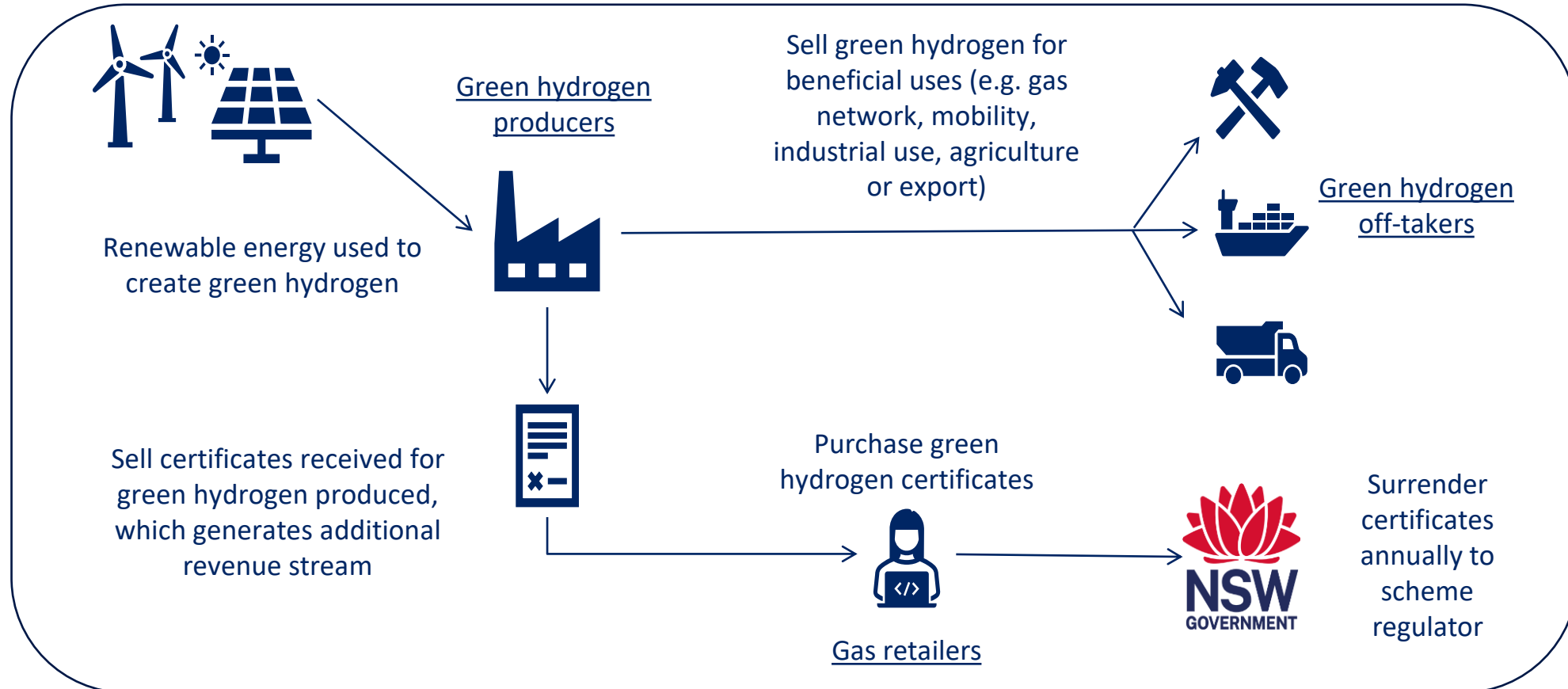
For a period of
12 years

\$0
GreenPower accreditation fees

Action 7 - NSW Renewable Fuel Scheme

Australia's first incentive scheme for green hydrogen production will commence in 2024.

8 million GJ*
(~67,000 tonnes) of
green hydrogen
production targeted by
2030



*GJ = gigajoule

Action 7 - Scheme targets and timeframes

Targets

Year	GJ	Tonnes*	MW [^]
2024	90,000	750	5
2025	360,000	3,000	21
2026	890,000	7,417	53
2027	1,780,000	14,833	106
2028	3,200,000	26,667	190
2029	5,330,000	44,417	317
2030–44	8,000,000	66,667	476

**indicative only*

To be finalised in regulation and rule:

- scheme penalty rate
- exemptions framework
- certificate creation – intersections with Guarantee of Origin Scheme

Implementation schedule

2021 – Scheme legislated

2022 – Regulations and rule development

2023 – Regulations and rule gazetted

2024 – Scheme commences

[^]MW = Megawatts

Regional Actions & Considerations

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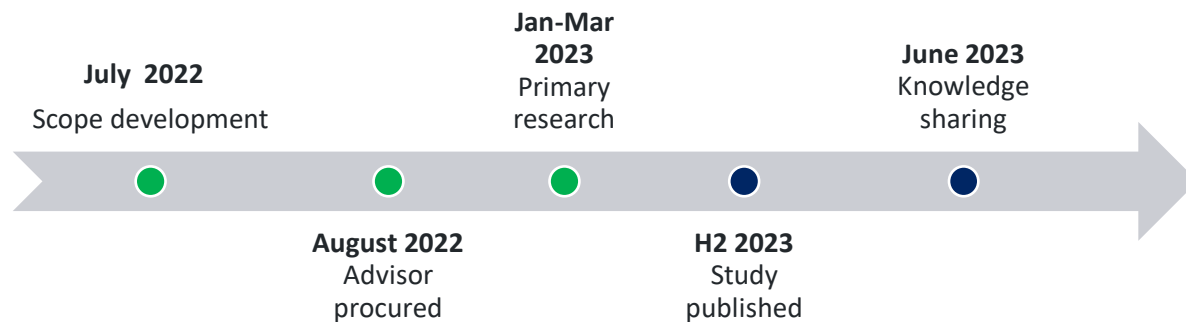
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Action 43 – Green Ammonia Market Study

Providing market insight to support policy and investment planning

- Partnering with Australian Hydrogen Council
- Seeking primary data and price validation
- Final output will be publicly available report
- Final report expected in H2 2023



Hydrogen buses

\$25 million Regional Zero Emission Bus (ZEB) Trials

- Aim is to assess and determine the best solution for the transition to ZEBs in Regional NSW
- Trials will include hydrogen buses and coaches alongside battery electric buses
- **NSW Regions:** Hunter, Far North Coast, Mid North Coast, New England, Central Coast, Cumberland/Prospect, Nepean, Northern Sydney, Inner West, South East Sydney, South West Sydney, Central West, Orana/Far West, Riverina/Murray, Illawarra, Southern Highlands



Red Bus trial (Central Coast) - NSW's first hydrogen bus trial

Delivered in partnership:

- Office of Energy and Climate Change
 - Transport for NSW (TfNSW)
 - ARCC (bus manufacturer)
 - Red Bus (Central Coast operator)
 - Origin Energy (project management).
-
- Australian company ARCC prototype assembled in Western Sydney.
 - This trial ended in June 2023 and lessons learned are being collated



Action 45 - Hydrogen reticulation pipeline in Wagga SAP

Wagga



- Strategic Infrastructure Review
- Wagga Master Plan
- Business & Industry use





Water for Hydrogen Production

Water consumption for hydrogen production will be relatively small in comparison to other sectors

- Water usage of up to 23,000 ML for the production of **2.5 Mt** of hydrogen in NSW in 2050
- ➔ Equivalent to **0.14%** (or 1/700) of NSW's current water use
- Hydrogen production water usage when compared to other industries in NSW:
 - 24% of water used in manufacturing
 - 16% of water used in mining
 - 0.4% of water used in agriculture
- Hydrogen production needs can also be met by:
 - using high-quality recycled water
 - improving overall water efficiency in the economy



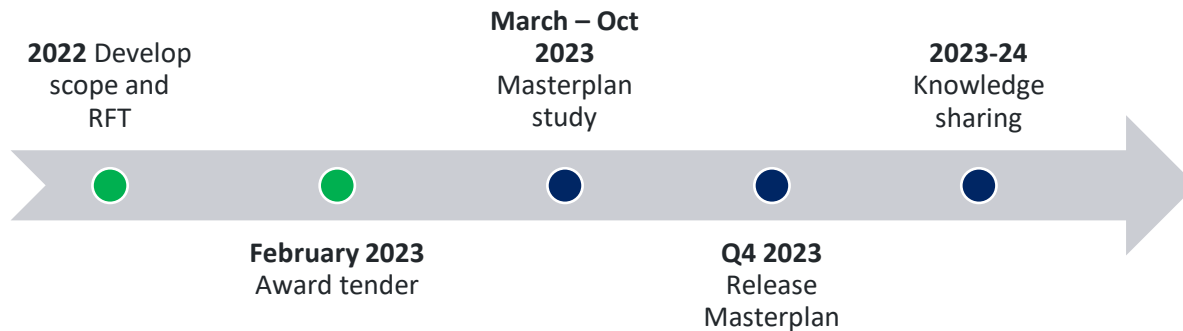
Annual hydrogen production capacity from waste water (Mt)			
 Location	Mt	 Location	Mt
Moree	0.6	Hay	0.6
Narrabri	0.1	Wagga Wagga	1.2
Armidale	0.6	Hunter	8.8
Dubbo	0.7	Illawarra	11.7
Parkes	0.6		

Action Highlights

Action 1 - Hydrogen Infrastructure Masterplan

Scaling our energy system to manage GW scale green hydrogen production

- Determining optimal supply chain and infrastructure configurations to meet hydrogen demand growth
- Guidance to NSW government and industry on planning and investment decisions
- Building on National Hydrogen Infrastructure Assessment



Production



Storage

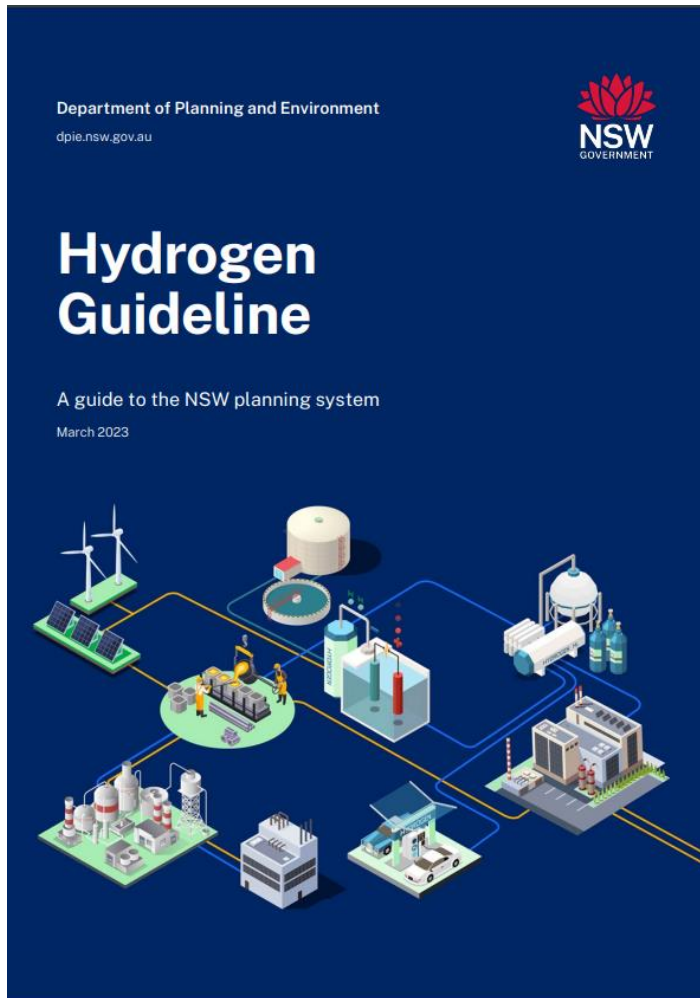


Distribution



Use

Action 21 – Hydrogen Planning Guideline



Guidance on how the NSW planning system can facilitate development of a hydrogen economy

The Guideline helps industry and regulators identify:

- How hydrogen development could be characterised
- Whether a proposed development is permissible
- What planning pathways are available

It will be updated as the planning framework is amended to support safe and efficient hydrogen development, and industry matures.

Accessible at planning.nsw.gov.au

Action 52 – Port infrastructure assessments

How can we streamline investment decisions for international trade consortiums?

- Front loading planning studies
- Updating planning instruments
- Port infrastructure feasibility studies
- Scoping currently underway



Other relevant actions & initiatives

Grant programs

- **\$250 million** - Renewable manufacturing fund
- **\$305 million** - for High Emitting Industries grant
- **\$300 million** - Low Carbon Product Manufacturing Fund
- **\$195 million** - for Climate Technology Innovation
- **\$110 million** - Regional Investment Activation Fund

Other actions

- **Action 13** – Electricity Infrastructure Roadmap
- **Action 5** – Precinct decarbonisation roadmaps
- **Action 21** – Planning and regulatory guidance material



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Join +3000 industry professionals at the region's largest and most senior Hydrogen Summit.



Connecting world hydrogen leaders

Showcasing innovative technologies & solutions



Networking across the value chain

In Partnership With:



Supported By:



Australian Government

Australian Trade and Investment Commission



**ASIA-PACIFIC
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2023**
SUMMIT & EXHIBITION

26 - 27 OCTOBER 2023
ICC SYDNEY, AUSTRALIA

Questions and contact

<https://www.energy.nsw.gov.au/business-and-industry/ways-get-started/hydrogen-nsw>

hydrogen@planning.nsw.gov.au

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