Ammonia Energy Conference 2022

Australian Policy

The Next 12 Months: Generating demand for green hydrogen and ammonia

By: Matt Baumgurtel

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Hamilton Locke

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Advantages and opportunities – NH3

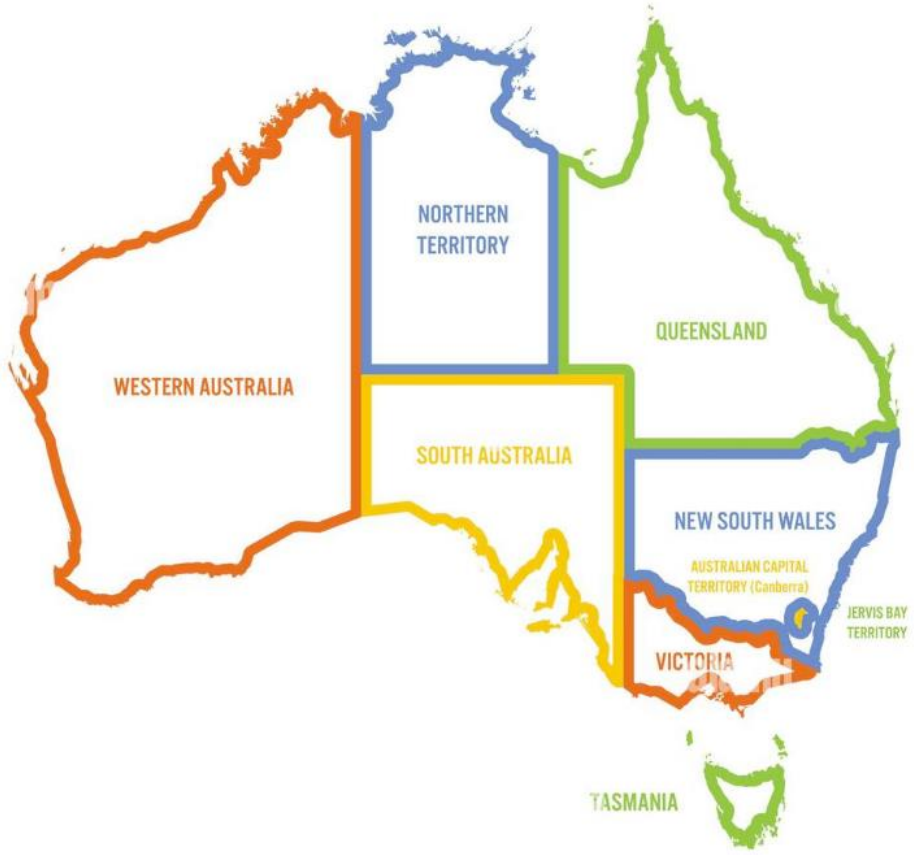
- Australia has the energy resources, technical skills + track record with international partners to become an H2 / NH3 leader
- Energy density of NH3 by volume is nearly 2x that of liquid H2
- NH3 has been traded globally for decades - well developed technologies for large scale storage and transport
- International shipping routes well-established – comprehensive network of ports worldwide handing ammonia at large scale
- Employment opportunities
  - If Australia were to produce 6.5% of the world's NH3 with green H2 by 2050, there would be a further 5,000 ongoing jobs.

Current state of play – Australia

Northern Territory
- Focus areas
  (1) local industry development
  (2) resources management, grow and harness demand
  (3) support innovation and responsive regulation
- $5m over four years to expand H2 industry

Western Australia
- Focus areas:
  (1) Export
  (2) remote applications
  (3) H2 blending
  (4) transport
- $117.5m commitment for establishment of renewable H2 hubs in Pilbara and Mid West regions

South Australia
- 5 focus areas
  (1) facilitate investments in infrastructure;
  (2) establish a regulatory framework;
  (3) deepen trade relationships;
  (4) foster innovation and workforce skills development;
  (5) (integrate hydrogen into the energy system.
- More than $500m to be dedicated to new H2 projects, shipping infrastructure and modelling tools for investors and developers



Tasmania
- Pillars – explore opportunities for domestic and export markets, provide financial support, ensure a robust regulatory framework, build community and industry awareness
- $50m Tasmanian Renewable Hydrogen Development Funding Program

Queensland
- Investment partnerships with Iwatani Corporation, IHI Corporation Japan, ENEOS Corporation, Sumitomo Corporation, ITOCHU Corporation Ark Energy (Korea)
- Hydrogen and Renewable Energy Jobs Fund - $2B

New South Wales
- 3 pillar approach
  (1) enable industry development
  (2) lay industry foundations
  (3) drive rapid scale
- $380m net funding in Net Zero Industry + Innovation Program, to support hard-to-abate facilities

Victoria
- 3 focus areas
  (1) Foundation for renewable hydrogen (R&D, workforce, education)
  (2) Connecting the economy (gas networks, electricity, export);
  (3) Leading the way (H2 pilots, social license, hydrogen leader)
- $6.6m provided through Renewable Hydrogen Commercialisation Pathways Fund to support 6 projects to produce H2 in real world applications
- $600k provided through the Business Ready Fund to support businesses transitioning to renewable H2.

Current state of play – International

Japan

- By 2030, H2 and ammonia will make up 1% of both the energy mix and electricity supply mix
- Focused on expanding its H2 market from 2m tonnes per year to 3m tonnes per year by 2030 to 20m tonnes per year by 2050.
- Investing in all carriers including LH2, MCH, ammonia
- Japan's green innovation fund to accelerate R&D in hydrogen in fiscal 2021 year was over US$3.4 bn

South Korea

- During FY2021, government H2 spending totalled almost US$702m
- Plans to grow domestic annual consumption from 130,000 tonnes in 2018 to nearly 5.3m tonnes by 2040
- In 2020, introduced the Hydrogen Economy Promotion and Hydrogen Management Law – provides industry with overarching legal framework outlines requirements and expectations

United States

- US$9.5B to H2. Currently no comprehensive H2 strategy but several federal/state agencies
- Biden Administration introduced several proposals to expand tax credits for clean energy and suggested pairing investment in 15-low carbon H2 demonstration projects with a new tax credit for low-carbon H2 production facilities

United Kingdom

- £240M directly, £1.3B for net zero with H2 as priority
- Ten Point Plain for a Green Industrial Revolution- aiming for 5GW of low carbon H2 by 2030
- Currently no incentive mechanisms – the Hydrogen Business Model being proposed will involve support for H2 producers via private law contracts & government counterparties

European Union

- Innovation Fund expected to provide €20B of support over 2020-30 – commercial demonstration of low carbon technologies
- Netherlands – production of H2 primarily financially supported through the Stimulation of sustainable energy production and climate transition – grant of subsidies to hydrogen producers over 15-year period
- German-Australian Hydrogen Innovation and Technology Incubator (HyGATE) Partnership – both nations committed up to $50m and €50m to establish and support real-world pilot, trial and demonstration projects

Generating supply and demand

1

Incentivising green H2 production

Bridging the gap between green and non-green H2

2

Disincentivising substitutes for green H2

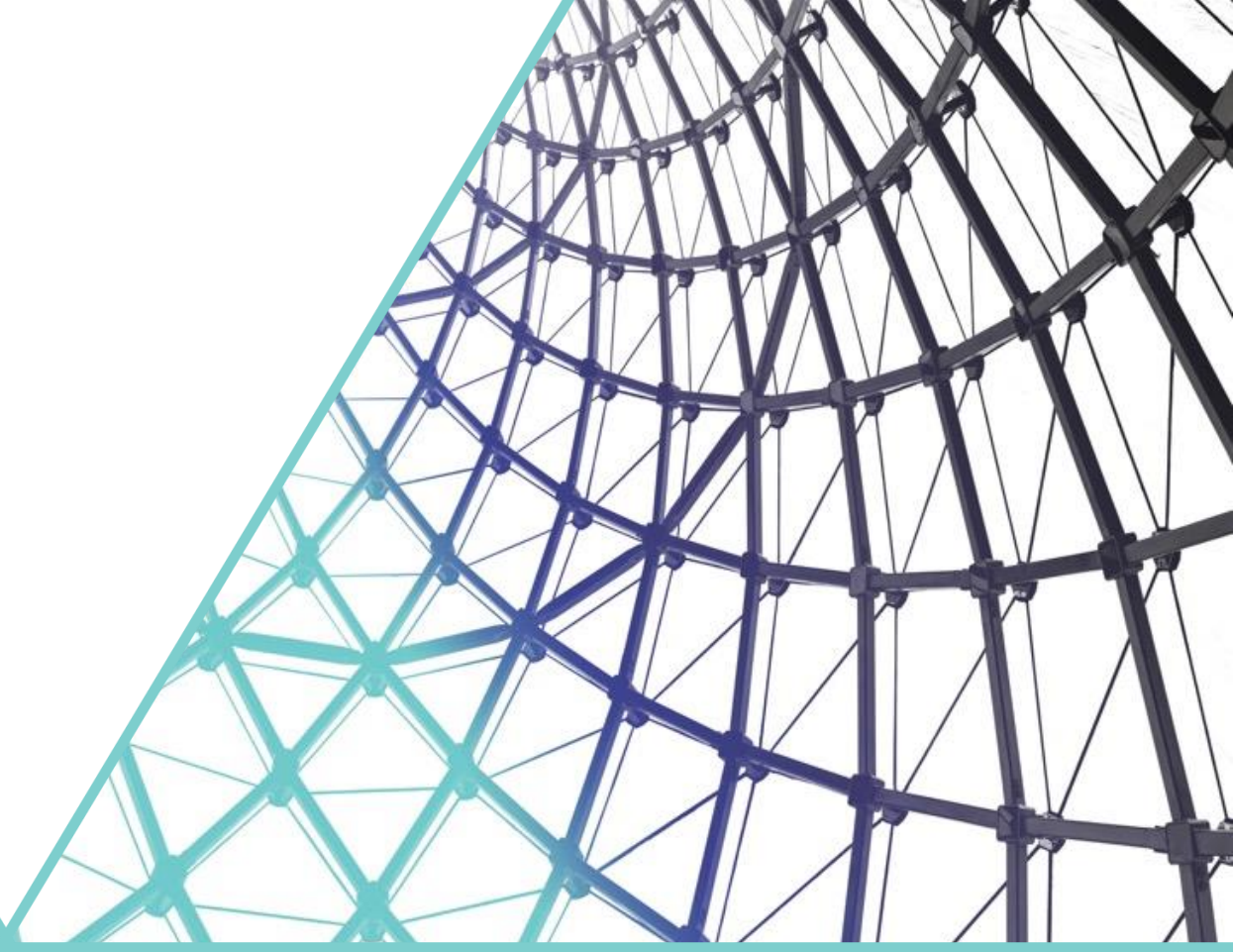
Either by taxing or regulating use or price

Generating supply and demand – policy action

	Direct Intervention – funds, goods + services	Indirect Measures – regulations, mandates, standards, rules
Supply side	• Grant funding for technology developments and pilot projects • Public Private Partnerships (PPPs) • Equity co-investments • Loans • Tax incentives • Government investment into enabling infrastructure	• Mandated supply side targets • Underwriting risk • Foreign Direct Investment Attraction facilitation
Demand side	• Grants, rebates and subsidies for offtakers or through market mechanisms e.g. RET • Government backed off-take agreements and guarantees • Government purchases • Contracts for difference • Tax Incentives	• Mandated demand side targets – fuel mix, blending targets etc • Legislated performance standard • Certification

Thank you

Matt Baumgurtel
Partner | New Energy Lead
E: matt.baumgurtel
@hamiltonlocke.com.au
T: +61 459 900 080



hamiltonlocke.com.au

Level 42, Australia Square,
264 George Street, Sydney NSW 2000

Hamilton Locke