



Pre-election submission

Australian Hydrogen Council

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Submission to the Queensland Government

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Contents

| | |
|---|----|
| About the Australian Hydrogen Council | 3 |
| The importance of the hydrogen economy | 4 |
| Summary of recommendations | 6 |
| Recommendations in detail | 7 |
| Supporting hydrogen infrastructure and driving demand | 7 |
| Replacing diesel in remote applications | 8 |
| Replacing natural gas | 9 |
| Transport applications | 9 |
| Conclusion | 11 |

About the Australian Hydrogen Council

The Australian Hydrogen Council is the peak body for the hydrogen industry, with 47 members from across the hydrogen value chain.

Our members are at the forefront of Australia's hydrogen industry, developing the technology, skills and partnerships necessary to build Australia's hydrogen economy.



The importance of the hydrogen economy

The hydrogen industry has enormous potential to benefit Australia, through new export markets, decarbonising the economy and supporting energy security. Hydrogen also enables energy to flow between the electricity, gas and transport systems. This sector coupling capability makes hydrogen incredibly valuable.

Work for the National Hydrogen Strategy (NHS) estimated potential benefits to Australia could be as high as \$26 billion a year in additional GDP and 16,900 new jobs by 2050.¹

Australia is particularly well-positioned to play a key role in the hydrogen export market with its abundant renewable resources, existing bilateral trade relationships with Japan, Korea and China and low sovereign risk.

However, the window of opportunity will not exist forever. Competing hydrogen producers across the globe seek a share of the export pie and scaling up hydrogen production in their respective countries to supply the Japan, Korea and China markets as soon as 2025.² These competitors include Brunei, Qatar, UAE and Norway, and in the longer-term, market entrants such as the United States, Brazil, Chile and New Zealand.

Many of these countries enjoy the inherent strengths that Australia has for hydrogen production, including abundant renewable resources, access to low-cost gas for blue hydrogen production, underground facilities that can be utilised for carbon capture and storage, large areas of land for solar installations and proximity to key hydrogen export markets.

A major focus of the NHS is the need for the emerging Australian industry to achieve scale because projects to produce and deliver hydrogen are not yet commercially viable. Through smart policy Queensland can play a key part in achieving this.

Since the development of the NHS, it has become apparent that the speed of industry development is accelerating faster than anticipated (particularly for exports). Asian customers are looking for product as early as mid-2020s and states like Western Australia have bought forward their hydrogen plans by years.

Getting to scale is also a focus of the Australian Hydrogen Council. Industry requires governments as partners to share risk and commercialise projects to scale. We need to bring down the cost of hydrogen so that it can more effectively compete with existing carbon-emitting (and often subsidised) energy/fuel sources.

A real opportunity exists to build on the success of the renewables revolution and channel funding towards developing a hydrogen industry.

The 57 actions in the NHS have been endorsed by the Queensland Government. The challenge is now to flesh out the detail of the NHS and to take action to implement the actions.

¹ Deloitte (2019) *Australian and global hydrogen demand growth scenario analysis*; COAG Energy Council – National Hydrogen Strategy Taskforce, November, p 1, http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/nhs-australian-and-global-hydrogen-demand-growth-scenario-analysis-report-2019_1.pdf

² ACIL Allen consulting (for ARENA) (2018), *Opportunities for Australia from Hydrogen Exports*, page 15.

Given the economic downturn associated with the 2019/20 bushfire season and COVID-19 crisis, investing in hydrogen infrastructure projects represents a tangible means of stimulating and rebuilding the economy, especially in regional communities, whilst helping secure our energy future and positioning Australia – and Queensland – as a world leader in hydrogen.

Summary of recommendations

Recommendation 1

The Queensland Government applies grant funding to at least one anchor project within a hydrogen hub that can showcase the state's capabilities and attract investors to the region, particularly for export.

In order to clearly showcase capabilities, port and infrastructure assessments should be undertaken for a range of Queensland ports.

Recommendation 2

The Queensland Government commits to a hydrogen offtake to incentivise the private sector to make local hydrogen projects commercially viable.

Recommendation 3

The Queensland Government applies other investment incentives such as:

- Special or Low Carbon Economic Zones
- Export credits
- Underwriting demand and common use infrastructure
- TUOS exemptions.

Recommendation 4

The Queensland Government considers a new direct compensation measure to replace diesel standalone power systems.

Recommendation 5

The Queensland Government applies equivalent or better fuel rebates to hydrogen than it does on diesel.

Recommendation 6

The Queensland Government works with industrial users and pipeline operators to set a natural gas blending target in place by 2021 to provide investor certainty and establish the case with economic regulators.

Recommendation 7

The Queensland Government develops a grant programme to directly support the installation of hydrogen refuelling infrastructure for back to base FCEVs.

Recommendation 8

The Queensland Government sets a 50% zero emission vehicle target by 2030 for public bus fleets and State and Local Government light vehicle fleets. This would include privately operated public transport fleets and government owned logistics providers.

Recommendations in detail

Supporting hydrogen infrastructure and driving demand

Until the industry has reached commercial scale, grant funding is essential; currently a funding gap exists even with the presence of concessional financing.

The Hydrogen Council's 2020 *Path to hydrogen competitiveness* report (supported by McKinsey analysis) estimates that US\$70bn (A\$100bn) of investment in hydrogen is required across the globe by 2030 to meaningfully activate the global hydrogen economy:

Reaching the scale required will call for funding an economic gap until a break-even point is reached – an investment to offset the initially higher costs of hydrogen as a fuel and of hydrogen equipment compared to alternatives. Instead of being perceived as costs, this should be seen as an investment to shift the energy system and industry to low-carbon technology.³

Although US\$70bn (A\$100bn) by 2030 seems sizable, the report notes that this accounts for less than 5% of annual global spending on energy. In comparison, support provided to renewables in Germany totalled roughly US\$30 billion (A\$43 billion) in 2019.⁴

BNEF analysis goes further, estimating that US\$150 billion (A\$214 billion) will be needed globally until 2030 to bridge the cost gap between hydrogen and the *cheapest fossil fuels*, not just the cheapest low-carbon alternative.⁵

Public investments and policies to fill the gap can then **unlock several times their value from the private sector**. For example, the RBA notes that the:

Clean Energy Finance Corporation (CEFC) and the Australian Renewable Energy Agency (ARENA) have played an important role in helping developers obtain finance by directly financing projects and encouraging private investment. These agencies have directly invested around \$8.5 billion in clean energy-related projects since inception. They estimate that this investment has encouraged a further \$25 to \$30 billion of additional private sector investment.^{6 7}

These data were from ARENA and CEFC's 2018-2019 Annual Reports. On its website, ARENA currently advises that since 2012, it has:

supported 538 projects with \$1.58 billion in grant funding, unlocking a total investment of almost \$5.96 billion in Australia's renewable energy industry.⁸

³ Hydrogen Council (2020) *Path to hydrogen competitiveness: a cost perspective*, p.66, <https://hydrogencouncil.com/en/path-to-hydrogen-competitiveness-a-cost-perspective/>

⁴ Ibid.

⁵ BNEF (2020) *Hydrogen Economy Outlook: key messages*, March 30, pp. 4-5, <https://data.bloomberglp.com/professional/sites/24/BNEF-Hydrogen-Economy-Outlook-Key-Messages-30-Mar-2020.pdf>

⁶ De Atholia, T., Flannigan, G. and S. Lai (2020) 'Renewable energy investment in Australia', Reserve Bank of Australia <https://www.rba.gov.au/publications/bulletin/2020/mar/pdf/renewable-energy-investment-in-australia.pdf>.

⁷ If we take advice from the Hydrogen Council across two recent reports, a similar expectation of the ratio of public to private funds emerges: the 2020 report says around US\$70 billion is required from government, and in a 2017 report the Council states that 'building the hydrogen economy would require annual investments of [US]\$20 to 25 billion for a total of about [US]\$280 billion until 2030' (p. 66). See Hydrogen Council (2017) *Hydrogen Scaling Up: A Sustainable Pathway for the Global Energy Transition*, November, <https://hydrogencouncil.com/en/study-hydrogen-scaling-up/>

⁸ See <https://arena.gov.au/about/>

Assuming all else is equal, these figures suggest that government funding in hydrogen might be expected to unlock at least three times as much private investment.

Funding for Australian hydrogen production and use is currently unlikely to unlock private investment to get the industry to scale. This situation could be improved by individual states and territories helping draw through investment by co-investing in the right local projects.

Governments can also implement a range of incentives and rules to drive demand. For example, electrolyzers can act as inertia on the grid, and electrolyser response times are equivalent to batteries. These characteristics add value to the grid, and it can be argued that this value could be recognised by exempting hydrogen from transmission use of system (TUOS) charges. Early stage support to encourage common use infrastructure and attractive tax, credit and financing solutions are also recommended to attract private investment.

We also note that private sector financing can also be incentivised through governments acting as offtakers to hydrogen projects. The NSW Energy Package MOU from January 2020 is an excellent example, where the Australian and NSW governments are funding over \$2 billion in energy and emissions reduction initiatives to help NSW meet its target of net zero emissions by 2050.

Recommendation 1

The Queensland Government applies grant funding to at least one anchor project within a hydrogen hub that can showcase the state's capabilities and attract investors to the region, particularly for export.

In order to clearly showcase capabilities, port and infrastructure assessments should be undertaken for a range of Queensland ports.

Recommendation 2

The Queensland Government commits to a hydrogen offtake to incentivise the private sector to make local hydrogen projects commercially viable.

Recommendation 3

The Queensland Government applies other investment incentives such as:

- Special or Low Carbon Economic Zones
- Export credits
- Underwriting demand and common use infrastructure
- TUOS exemptions.

Replacing diesel in remote applications

Diesel is currently used extensively in mining and agriculture, and to power remote communities. Developing hydrogen remote area power systems (RAPS) can reduce Australia's reliance on imported diesel and support decarbonisation in these sectors and communities. The development of hydrogen remote applications would also generate jobs in the design, construction and operation of hydrogen systems and provide a much-needed training ground to develop local knowledge and experience in the industry.

From a cost comparison perspective, hydrogen can replace diesel as a fuel right now. However, the issue remains how to replace existing infrastructure (including vehicles, which we return to below) and how to produce the hydrogen at scale in a pre-commercial environment.

Hydrogen is also competing against a heavily subsidised fossil fuels industry. A 2019 International Monetary Fund paper calculated Australia's post-tax fossil fuel subsidies in 2015 as US\$19 billion (A\$28 billion), or US\$1,198 per capita (A\$1745).⁹ Post-tax subsidies were defined as the differences between "actual consumer fuel prices and how much consumers would pay if prices fully reflected supply costs plus the taxes needed to reflect environmental costs and revenue requirements".¹⁰

Recommendation 4

The Queensland Government considers a new direct compensation measure to replace diesel standalone power systems.

Recommendation 5

The Queensland Government applies equivalent or better fuel rebates to hydrogen than it does on diesel.

Replacing natural gas

Besides the obvious benefits of decarbonising Australia's gas use, the use of hydrogen in the natural gas networks can provide important domestic offtake support to the emerging hydrogen export industry. This opportunity to stimulate industry growth can also occur without significant additional investment in infrastructure or technology.

However, explicit government policy support is required, as the gas networks cannot effectively make rate cases to their regulator without policy endorsement for expenditure. The most valuable support at this stage is for governments to set targets for hydrogen blending into the gas distribution networks. This is a 'pen ready' market stimulus opportunity.

Recommendation 6

The Queensland Government works with industrial users and pipeline operators to set a natural gas blending target in place by 2021 to provide investor certainty and establish the case with economic regulators.

Transport applications

Decarbonisation of Australia's transport sector is becoming increasingly urgent. Transport is Australia's second largest emitter, making up 19% of current greenhouse emissions.

Decarbonising transport will only occur with a mix of batteries and hydrogen fuel cells. While both can be used for light vehicles, hydrogen has particular value in the heavy transport sector. As noted in the NHS, hydrogen fuel carries significantly more energy than the equivalent weight of batteries. This is particularly useful for buses, trucks and ships that carry heavy loads and can travel long

⁹ Coady, D., Parry, I., Le, N-P., and B. Shang (2019) *Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates*, IMF Working Paper, Fiscal Affairs Department, WP/19/89.

¹⁰ Ibid., pp. 7-8.

distances. Even with improvements battery efficiency the heavy transport sector remains very hard to decarbonise without clean molecules like hydrogen.

As with gas blending opportunities, transport also provides significant hydrogen offtake potential. Transport uses are more piecemeal than gas blending but have the advantage of having a public profile and can also replace diesel now.

Hydrogen can also bring new design and manufacturing opportunities to Australia in fuel cell technologies, to be used in the automotive, mining, aviation and marine industries.

Governments can provide the right signals by setting targets and reducing unnecessary barriers to uptake for vehicles. They can help create the demand that will draw through private investment in vehicles and infrastructure. This will give certainty to manufacturers and investors in the early stages.

Recommendation 7

That the Queensland Government develop a grant programme to directly support the installation of hydrogen refuelling infrastructure for back to base FCEVs.

Recommendation 8

The Queensland Government sets a 50% zero emission vehicle target by 2030 for public bus fleets and State and Local Government light vehicle fleets. This would include privately operated public transport fleets and government owned logistics providers.

Conclusion

Considering the current economic conditions and the opportunity that hydrogen presents, 2020 presents an excellent opportunity for the Queensland Government to implement the recommendations outlined in this submission in order to reap the benefits of a local hydrogen industry.

The Australian Hydrogen Council would welcome the opportunity to provide further detail about any of the recommendations made in this submission via CEO Dr Fiona Simon who can be contacted by email on fsimon@H2council.com.au or telephone 0474 028 740.