



Australia's transition to a green energy superpower

Australian Hydrogen Council

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Introduction

The Australian Hydrogen Council (AHC) is the peak body for the hydrogen industry, with over 100 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.

Australia has the natural resources, trade relationships and experience to become a green export superpower. It is crucial to note however, that despite the head start that the Australia has in this regard, reaching this ambition will require significant investment, decisive policy making and a genuine commitment to decarbonisation both domestically and abroad.

AHC has a keen interest in the export opportunity which is now presenting itself as the world considers the role that clean hydrogen will play. In exploring the policy and market settings needed to realise this opportunity, AHC sees synergies with, and examples from other sectors of the economy which can be used to leverage the opportunity.

In an increasingly unstable geopolitical environment, Australia enjoys a reputation as a trusted and respected trading partner. With international energy supply chains disrupted due to conflict, nations around the world should, and will, look to diversify their energy portfolio and partner with stable, democratic nations. AHC has heard from potential trading partners in Europe that the cost of transporting energy from Australia is a necessary premium which partners are willing to pay to offset the risk associated with dealing with less stable nations. As international hydrogen markets do not yet exist however, the quantum of this premium is unclear and efforts must be made to ensure that Australia remains relatively cost competitive.

In addition to Australia's reputation as a stable and trusted trading partner, we also have vast experience in exporting energy. While coal and liquified natural gas are the key energy commodities currently exported, the value of these exports will reduce. This is because the world will seek clean energy alternatives and the pivot to a green energy superpower seems a logical transition.

Australia accounts for slightly more than 1 per cent of the world's annual carbon emissions¹ however we have the opportunity to assist other nations with their reductions. While it could be argued that even a complete and immediate halt to domestic emissions would do little to curb climate change, the combined emissions of the major economies in our region approach 40% of global totals. Even if China (the world's largest emitter) is discounted from this figure, over 5% of the world's emissions come from trading partners on Australia's doorstep.

As a developed nation with relatively high per capita emissions Australia is duty bound to assist the world to reduce its impact on the climate. Doing so can also provide significant economic benefit. As illustrated by ACIL Allen, the export opportunity for green hydrogen has been estimated as being worth between \$A2.6Bn and \$A13.4Bn by 2040².

¹ Emissions Database for Global Atmospheric Research <https://edgar.jrc.ec.europa.eu/>

² ACIL Allen Consulting, 2018 Opportunities for Australian from Hydrogen Exports. pV

While these hydrogen exports are of key interest to AHC, Australia can also extract value from other green energy exports including renewable electricity, low carbon manufactured commodities and technology. These exports combined suggest that the size of the prize on offer to Australia is worth pursuing.

In order to capture the vast opportunity presented to Australia, bold policy and significant public sector investment will be required to unlock an even greater quantum of private sector investment. If Australia does not mobilise efforts, other nations will attempt to capitalise on the opportunity. Until recently, South American and Middle Eastern countries have appeared to pose the greatest immediate threat to Australia's hydrogen export ambitions. The passage of the Inflation Reduction Act (IRA) in the United States' however, signals their intent to attract the capital which may impact Australia's ability to produce required volumes of hydrogen. As well as legislating significant tax credits for green hydrogen production, the IRA provides \$US27 billion for a climate bank. As reported by Hydrogen Central³, McKinsey & Co. estimates that this will unlock \$US7-10 in private investment for every dollar spent. While ARENA and the Clean Energy Finance Corporation can play a similar role in Australia, the quantum spent in the US (a total of \$US500 billion in new investment and tax breaks) highlights the resources that Australia's competitors are committing to try and grab a slice of the clean energy opportunity. The opportunity is Australia's to lose, and without decisive, no regrets policy making, there is a real danger that we will do just that.

Domestic net zero

A key factor which needs to be acknowledged and addressed is the monumental task of achieving Australia's domestic net zero ambitions. To be truly recognised as a green energy superpower, Australia must also reduce emissions from its own energy use, and any plans for large scale exports should be made with this in mind. We know that the European Commission has recently backed away from proposed requirements for green hydrogen to be produced from newly constructed renewable energy, however the principle that green energy exports can not be at the expense of domestic decarbonisation is real in the minds of many policy makers.

The Albanese Government has legislated net zero emissions by 2050 and is developing policy to achieve this target. AHC is following developments in this space with interest and is aware of work being undertaken by Net Zero Australia, a collaboration between the University of Melbourne the University of Queensland, Princeton University and Nous consulting. Net Zero Australia's interim results highlight the effort and resource required for Australia to reduce emissions to the target level.

The interim findings indicate the need for a number of renewable energy infrastructure clusters across northern Australia referred to as 'Solar Tasmanias', so named because the footprint of each is roughly equivalent to the area of the island state. These installations will help to power Australia and their presence in the north half of the country suggests that they could play a role in facilitating exports through the production of hydrogen or undersea electricity cable projects. Importantly, they serve to illustrate the scale of the infrastructure build required. It should be noted, that the Net Zero

³ Hydrogen Central 2022, Biden's Inflation Reduction Act is Great News for Green Hydrogen <https://hydrogen-central.com/bidens-inflation-reduction-act-great-news-green-hydrogen/>

Australia work is not forecasting how Australia must reach net zero emissions but is merely presenting scenarios to enable conversation, planning and policy development.

The scale of the task at hand is such that Net Zero Australia consider that 1-1.3 million new workers⁴ will be needed to reach net zero. While the creation of this number of jobs is a boon for the Australian economy, the magnitude is such that demand for labour will create challenges which must be planned for now. It is worth noting that a significant number of these jobs will be in the construction of renewable energy infrastructure and this sector will be competing with other construction projects.

Adding value to our exports

Beyond the potential for direct exports of energy, Australia is well positioned to be a global leader in the manufacture of low carbon products. Investing in renewable energy will allow for a longer-term restructure of the Australian economy with the potential for new high-value jobs and exports.

Decarbonising our economy provides the ability to manufacture products with relatively low scope 2 emissions. The use of green hydrogen in the manufacture of direct reduced iron, alumina, fertiliser and concrete renders these products significantly cleaner than current production methods. This will open up export markets as demand for cleaner products grows. All of these products are listed as in scope for phase 1 of the European Union's proposed Carbon Border Adjustment Mechanism (CBAM) meaning that the opportunity for the reinvigoration of creation of Australia's manufacturing sector is significant and immediate.

In 2020, 64% of Australia's aluminium and 40% of Australia's steel was exported to countries which had, or were considering a carbon price⁵. Given the relative emission's intensity of Australia's current aluminium and alumina manufacturing, these exports could be at serious risk of becoming uncompetitive in the face of CBAMs. Australia's current place as an exporter of primary metals is at risk if Australia does not focus on decarbonisation. The green energy superpower opportunity will assist in Australia not only remaining competitive but allow for expansion of these industries and provide an opportunity to manufacture beyond primary metals to produce higher value exports (and a lower dependence on imports).

The International Renewable Energy Agency (IRENA) has calculated the economic benefits of relocating production of a number of fuels and commodities to locations with low renewable energy costs relative to the cost of shipping⁶. The analysis shows that aluminium production benefits greatly from lower renewable energy prices. This benefit remains even when the commodities need to be shipped long distances and could allow Australia to penetrate additional, distant export markets.

⁴ Net Zero Australia, 2022 Interim Findings p22. <https://www.netzeroaustralia.net.au/wp-content/uploads/2022/08/Net-Zero-Australia-interim-results-draft-public-version-30-August-22.pdf>

⁵ Muller, Saddler and Melville-Rea, 2021, Carbon Border Adjustments, What are they and how will they impact Australia. The Australia Institute. p20 <https://australiainstitute.org.au/wp-content/uploads/2021/06/P1031-Carbon-Border-AdjustmentsWEB.pdf>

⁶ IRENA (2022), Global hydrogen trade to meet the 1.5°C climate goal: Part I – Trade outlook for 2050 and way forward, International Renewable Energy Agency, p21

The analysis indicates that low renewable energy costs could provide a strong incentive for production to relocate. This will boost Australia's existing production capability and allow for the growth or establishment of industries such as ammonia, methanol and jet fuel production which can also benefit greatly from low cost renewable energy.

Australian technology

The Australian opportunity extends beyond the export of green energy and commodities manufactured with the same. Australian green energy technology can support the decarbonisation of other economies and provide new, valuable export markets.

The production, storage and use of green hydrogen will all benefit from technological advancement and AHC is proud that some of these advances are happening within Australia right now. Star Scientific and Hysata are Australian companies leading the world in hydrogen technology.

Star Scientific's HERO process is proprietary technology with applications for zero emissions industrial heating, power generation and water desalination. The process uses a catalyst to release heat from hydrogen without combustion. Hysata, a company spun out of research by the University of Wollongong, has developed technology which can improve the efficiency of electrolysers and lead to reduced production costs for green hydrogen. The efficiency gains from Hysata's technology will reduce the amount of renewable electricity required to make green hydrogen.

Other Australian companies are undertaking world leading work in the hydrogen sector and no doubt within our parts of the renewable energy industry. The Australian economy could benefit by supporting businesses who develop cutting edge technology. Establishing the right environment to invest in research and development will enable more enterprising Australia's make the breakthroughs which will both smooth the path to decarbonisation and benefit the economy.

Economic incentives will undoubtedly play a role in driving research, however AHC recently accompanied a CSIRO delegation to the USA and noted vast differences between the Australian and US science and research eco-systems. We suggest that further work could be done to establish the suitability or otherwise of a National Labs, type structure for Australia.

Conclusion

The economic and climate benefits of Australia becoming a green energy superpower are enormous. The pathway to achieving this is however not as easy anticipated by some and will require the right policy framework, adequate investment and bi-partisan commitment.

AHC considers that policy to initially decarbonise domestic industry is critical. This policy should include:

- Holistic planning for net zero across the economy;
- Mechanisms to develop markets for hydrogen such as targets and emissions standards across a range of sectors;
- Investment attraction mechanisms in the vein of the US Inflation Reduction Act. These could include fiscal or other incentives to draw foreign capital to Australia; and

- Steps to ensure that Australia has a fertile environment for research and development.

These steps should be taken in addition to existing government policy including amendments to the Safeguard Mechanism, the roll out of a comprehensive Electric Vehicle strategy and already announced funding for hydrogen hubs and powering the regions.

We look forward to continuing to engage on this matter.

If you wish to discuss any element of this submission in further detail, please contact Joe Kremzer, General Manager, Policy on 0413 266 081 or email jkremzer@h2council.com.au.