

21st May 2024

Brad Archer
Chief Executive Officer
Climate Change Authority
John Gorton Building, King Edward Terrace
Parkes ACT 2600

Dear Brad,

Re: Climate Change Authority 2024 issues paper: targets, pathways and progress

The Australian Hydrogen Council (AHC) welcomes the opportunity to respond to the Climate Change Authority (the Authority) regarding the inputs, assumptions and direction of proposed advice to the federal government on Australia's climate goals, progress and sectoral pathways.

The 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 ensure that hydrogen and its derivatives play a meaningful role in decarbonising Australian industry.

Hydrogen will be critical to decarbonise the hard to electrify and difficult to abate sectors of the economy, whether in its ability to decarbonise steelmaking (at least the iron ore reduction phase), provide heat for high temperature processes (such as processing bauxite into alumina to make aluminium), for heavy transport (including as a feedstock for future marine and aviation fuels), or to support food security via ammonia fertilisers. There is an enormous amount of work required to scale the production of clean and green hydrogen and derivatives to meet these future needs, none of which are currently commercially viable for decarbonisation purposes.¹

It has been said that creating this new hydrogen industry is like the birth of the global LNG market, or the early solar industry. These were large and took years of focus, and this was even though each produced energy we could use and value; that is, natural gas and electricity. In contrast, we need to create an entirely new market for clean and green hydrogen, with new forms of production, new ways to use hydrogen and a new end-to-end supply chain that is supported with an appropriately resourced ecosystem.

Australia's ability to produce hydrogen and its derivatives should be considered as a key matter of national interest, supported by significant policy and investment incentives to increase the production, utilisation and potentially export of clean and green fuel alternatives. Cost competitiveness and parity with fossil fuels will not happen without preparedness for extensive, long term government support and provision of subsidies. Governments must be market creators at this stage of the energy transition, to enable the extensive reallocation of private funds alongside significant public expenditure required to support construction and operation of infrastructure in the public interest. We note the significant support for the hydrogen and net zero ecosystem in the 2024-25 Australian federal budget² which

¹ The limited existing manufacture of hydrogen usually relies on fossil fuels for onsite needs.

² AHC (2024) *Federal budget sets bold vision for Australia's hydrogen industry*, media release, 14 May, <https://h2council.com.au/wp-content/uploads/2024/05/240514-AHC-MR-Federal-Budget-FINAL.pdf>.

strongly aligns with this sentiment, and we hope that the Authority's modelling can assist in the design of these mechanisms.

In 2023, AHC produced a position paper³ in response to the draft National Hydrogen Strategy that considered the broad requirements for developing the hydrogen industry. This paper provides a comprehensive overview of the possible policy levers, enablers of investment, and inputs required by industry as it scales, as well as the research and planning gaps. The position paper is submitted for your consideration as an attachment to this response and its 53 recommendations are presented in the Appendix.

The rest of this submission provides additional context, exploring sequencing and dual investment streams, as well as how targets can facilitate the financing of the transition.

Sequencing and concurrent investments

As evidenced in the Issues Paper, the Authority is keenly aware that each sector will have differing challenges and timelines in decarbonising. The paper, however, did not advocate strongly enough for how integral the Authority's work is in providing impetus and incentive to decarbonise the whole of economy. Thoughtfully sequencing the transition of electrons and molecules while considering Australia's industries, manufacturing ambitions, economy and communities requires robust modelling and analysis of the timeframes.

The risk to progressing Australian hydrogen projects partially lies in that the supply chains for clean molecules have not yet been established and in the lack of availability of the technologies that will be required for some necessary processes, whether this be due to low technology readiness or commercial viability.⁴ The Authority has a role in investigating the likely deployment trajectories of each technology and the sentiments within each of the most impacted industries. More work is required to outline these timelines for the confidence of investors and project developers, clarifying how long it takes for projects to get to scale (and how many projects will be required) in order to achieve our carbon emission reduction targets. A clear forecasted timeline could also assist in preparing communities for transition, including for social licence reasons, as well as enabling workforce planning and building the social infrastructure required.

Further to how the transition is sequenced, is the necessity for multiple streams of simultaneous investment to cover and prepare for each stage. For example, there is an opportunity for Australia to establish a low carbon fuels industry as this supports fuel security, recognises the lower energy density of green fuels, and incentivises decarbonisation through supply. Separate modes of transport and industries are working to unpack the research, trajectory, and timelines of different low carbon fuel options, but there is significant overlap, especially regarding biofuels and hydrogen. While hydrogen is often considered the long-term solution (given the natural limitations of biofuels), both avenues need to be progressed in tandem to ensure that there is sufficient hydrogen available when the demand requires it.

³ AHC (2023) *A fit-for-purpose refreshed National Hydrogen Strategy: next steps for building Australia's hydrogen industry*, August, <https://h2council.com.au/ahc-publications/>.

⁴ *Ibid.* See section 4.3.5 *Research, development and demonstration* for a discussion on the different TRLs regarding hydrogen.

Low carbon, transitional alternatives such as drop-in fuels, have an important role to play in scaling the green premium and reaching our interim targets. However, if the destination is 2030, we will have severely under planned for the scale of investment and lead times required to achieve net zero by 2050. In this, we need early and sustained investment in each of the necessary efuels and clean molecules that will tackle the hard to abate applications. Regardless of the specific green fuel, there is a significant cost gap between traditional and alternative fuels, which must be thoughtfully considered and addressed.

We note the recent Powering the Regions Fund announcement⁵ investing \$330 million in nine projects across heavy industry. While AHC is supportive of this work, the investments are generally addressing efficiencies and electrification. This is essential decarbonisation progress, however, does not capture the most prohibitive investment leaps of faith that are the hard to electrify or abate processes. It is with policy, investment and concurrent action that this gap can be reduced and more commercially approachable as it becomes more imminently necessary.

Targets signalling ambition to investors

AHC welcomes the work undertaken by the Authority to model the pathways and targets for Australia's transition. These targets are integral in communicating seriousness to domestic and international investors, providing confidence and addressing risk. This is fundamentally how we finance the transition. Targets founded in ambition will drive the carrots and sticks that enable decarbonisation. However, if the targets and corresponding policy (including remaining open to export) do not adequately align and display ambition, then international investment is an opportunity for Australia to lose. This language is beginning to surface in government communications⁶ and the federal budget has shown commitment in addressing this, but it bears reinforcing through data and advice from the Authority, modelling the magnitude of the prospect to ensure the words are embodied in action.

Australia is a trusted energy partner across Asia and the export of molecules is critical to Australia's prosperity. It is integral that export of energy vectors remains an option that is actively supported by government policy and incentives. Our trade partners are confronting their own decarbonisation challenges within their national context, and Australia has an important role in remaining a source of clean energy, in whatever form is required.

Overall, whilst significant export of hydrogen and its derivatives is not anticipated until the early 2030s, planning and environmental approvals for the development and construction of supply chains and supporting infrastructure need to begin now – and the significant investment decisions required for these supply chains will not be taken by private sector actors until there is policy certainty and stability, alongside dedicated and long-term financial incentive or subsidy. Australian policy and decision makers are creating the economic conditions for the emergence of entire new industries in Australia. The products that could be manufactured, produced, and traded are central to the energy and economic security of our trading and security partners across the region.

⁵ Bowen, C. (2024) *\$330m investment in Australian heavy industry future*, Australian Government, media release, 24 April, <https://minister.dcccew.gov.au/bowen/media-releases/330m-investment-australian-heavy-industry-future>.

⁶ For example: Albanese, A. (2024) *A future made in Western Australia*, Australian Government, speech, 8 May, <https://www.pm.gov.au/media/future-made-western-australia>.

The AHC contends that in the absence of very significant and rapid reallocation of Australian private capital, the scale of the investments required for hydrogen production (power, transmission, storage of electrons, electrolyzers, storage of hydrogen as well as downstream uses of the hydrogen such as production of ammonia or reduction of iron ore) necessitate international investment. AHC is hopeful that the regional and national priorities arising from the departmental and Authority's sector decarbonisation strategies currently under development will also consider the role of hydrogen investment and policy, and how hydrogen can be an integrated rather than isolated stream within net zero planning.

Collaboration and support

AHC is pleased that the Authority is undertaking the sectoral, whole of economy modelling that will thoughtfully determine Australia's targets, based on the interrogation of interlinks between sectors, opportunities for efficiencies, including Australia's future goals in hydrogen and advanced manufacturing, and aligning with recommendations for the Paris Agreement. It is pivotal that the Authority provides advice for robust targets that spur greater ambition and momentum in Australia's decarbonisation.

AHC convenes a number of member working groups, including dedicated committees for policy and technical systems. We and our members would be pleased to participate in targeted consultations ahead of the Authority's formal advice.

If you have any queries or wish to discuss any element of this submission in further detail, please contact me at ncerexhe@h2council.com.au.

Yours sincerely,

Natasha Cerexhe
Policy Officer
Australian Hydrogen Council

APPENDIX A: Recommendations from AHC's response to the National Hydrogen Strategy Refresh

Government role

Topic	Recommendation	Section of paper
Overall	Recommendation 1: Commit to significant market making and ecosystem building in the public interest	2.1
	Recommendation 2: Task the Net Zero Economy Agency with overseeing the implementation of the refreshed NHS.	2.1
	Recommendation 10: Support the refreshed NHS with public implementation plans and stakeholder engagement.	2.3

Priorities

Topic	Recommendation	Section of paper
Domestic	Recommendation 6: Prioritise hard to abate and scalable domestic demand sources.	2.2
Export	Recommendation 7: Support hydrogen for export as an energy vector and for value added products such as green iron.	2.2
Emissions	Recommendation 21: Remain open to blue hydrogen for regions that can support it without unnecessarily delaying renewable hydrogen developments.	4.2

Targets

Topic	Recommendation	Section of paper
Targets	Recommendation 9: Set hydrogen targets for 2030 and 2040, with a range for 2050.	2.3

Analysis

Topic	Recommendation	Section of paper
Overall	Recommendation 3: Task the Net Zero Economy Agency to oversee a rolling programme of industry analysis to support ecosystem planning.	2.1
Costs	Recommendation 4: Task the Net Zero Economy Agency to oversee an assessment of cost and clarify investment needs from the public and private sectors.	2.1
NHIA	Recommendation 5: Extend and re-run the NHIA analysis to support decision-making for the refreshed NHS.	2.1

Topic	Recommendation	Section of paper
	Recommendation 29: Ensure a refreshed NHIA addresses refuelling infrastructure.	4.2
Supply chain	Recommendation 8: Assess Australia’s hydrogen supply chain risks and opportunities.	2.2
Energy	Recommendation 20: Develop consistent energy planning scenarios and cost recovery mechanisms by connecting AEMO, AEMC and energy regulators with the Net Zero Economy Agency and the refreshed NHS.	4.2
	Recommendation 52: Undertake a full energy market and grid impact analysis for wide scale adoption of electrolysers as flexible load in the electricity grid.	5.4
Water	Recommendation 22: Develop a national assessment of hydrogen industry water needs and required planning to meet the revised NHS objectives and support long-term water security.	4.2
Pipelines	Recommendation 23: Develop a national assessment of hydrogen pipeline corridors, easements, and route alignment.	4.2
Ports	Recommendation 24: Develop a national assessment of port capability to meet the revised NHS objectives and targets.	4.2
Storage	Recommendation 27: Develop a national assessment of hydrogen storage needs for different purposes, timeframes, and locations.	4.2
Workforce	Recommendation 34: Undertake capacity gap analyses to support regional development.	4.3
RD&D	Recommendation 39: Develop and articulate RD&D priorities for hydrogen.	4.3
Regulation	Recommendation 42: Undertake and publish a regulatory gap analysis and programme of reform.	4.3
Shipping	Recommendation 51: Develop a national assessment of shipping routes and refuelling requirements.	5.3
Aviation	Recommendation 53: Work with the Department of Infrastructure, Transport, Regional Development, Communications and the Arts and its Jet Zero Council to consider the next steps for hydrogen for SAF production, using the CSIRO Futures report.	5.5

Ecosystem, engagement and implementation

Tier 1: Short term implementation priorities

Topic	Recommendation	Section of paper
Overall	Recommendation 15: Create Hydrogen Economic Zones to support regional hydrogen initiatives and connect the relevant supply, demand, infrastructure and workforce.	4.1
	Recommendation 31: Boost Australian Government ability to attract and deploy private capital.	4.3
Emissions	Recommendation 46: Clarify the next steps and fast-track the process to implement the GO scheme.	4.3
Export	Recommendation 11: Support the refreshed NHS through a clear investment proposition.	3.1
	Recommendation 12: Develop joint support packages between Australia and its trading partners to support trade in hydrogen and hydrogen derivatives.	3.1
	Recommendation 13: Explicitly locate hydrogen production and use within the current international agreements on critical minerals.	3.3
	Recommendation 14: Actively seek risk and information sharing opportunities with like-minded international partners.	3.3
Industry capability	Recommendation 38: Create a 'one stop shop' and case management to assist with funding and permissions.	4.3
Ports	Recommendation 26: Commit to a funding envelope for ports.	4.2
Storage	Recommendation 28: Commit to a funding envelope for common user storage.	4.2
Heavy transport	Recommendation 30: Commit to a funding envelope for refuelling infrastructure.	4.2
	Recommendation 48: Support hydrogen in heavy road transport with a national ZLEV strategy, fleet trials, transition funds, and either a heavy vehicle fuel efficiency standard or sales target.	5.1
Industrial sectors	Recommendation 49: Attract private investment for hard-to-abate industrial processes.	5.2

Tier 2: Medium term implementation priorities

Topic	Recommendation	Section of paper
Community	Recommendation 32: Support a new programme of work on community water values and hydrogen awareness.	4.3
	Recommendation 33: Develop messages and communications support for the refreshed NHS to roll out to all governments and industry.	4.3
	Recommendation 45: Work with AEMC and AER on cost and price models to ensure affordable energy bills.	4.3
Industry capability	Recommendation 36: Support a lessons learned repository through CSIRO's Knowledge Hub.	4.3
	Recommendation 37: Support the Australian Hydrogen Council to expand the scope of HyCapability.	4.3
	Recommendation 16: Support a nationally connected and coordinated regional network facilitated by the Australian Hydrogen Council.	4.1
	Recommendation 17: Support Business Renewables Centre Australia to expand its remit and create hydrogen specific modules.	4.1
Supply chain	Recommendation 18: Support the development of domestic electrolyser production and assembly through a domestic manufacturing package.	4.2
	Recommendation 19: Secure supplies of raw materials (e.g., nickel and platinum group metals) and other key components.	4.2
Workforce	Recommendation 35: Drive coordination of competency standards and training packages for hydrogen.	4.3
RD&D	Recommendation 40: Work with CSIRO and the Chief Scientist, and other RD&D leaders to deliver hydrogen RD&D priorities and knowledge sharing.	4.3
	Recommendation 41: Establish common testing and prototyping infrastructure.	4.3
Ports	Recommendation 25: Select and support ports with existing industry connections to be demonstration ports.	4.2
Heavy transport	Recommendation 43: Harmonise Australian heavy vehicle regulation with international standards.	4.3
Industrial sectors	Recommendation 44: Develop harm prevention regulations to support industrial sectors.	4.3
	Recommendation 47: Support Australian-made clean products in hard-to-abate industries, supported by government procurement.	4.3
	Recommendation 50: Develop bespoke packages for other early adopters in high temperature process heating.	5.2