

Department of Climate Change, Energy, the Environment and Water (DCCEEW)

Submitted online

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RE: National Hydrogen Strategy Review – Consultation paper

The Australian Energy Council (AEC) welcomes the opportunity to make a submission in relation to the National Hydrogen Strategy Review – Consultation paper (Consultation paper)

The AEC is the peak industry body for electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. AEC members generate and sell energy to over 10 million homes and businesses and are major investors in renewable energy generation. The AEC supports reaching net-zero by 2050 as well as a 55 per cent emissions reduction target by 2035 and is committed to delivering the energy transition for the benefit of consumers.

Decarbonising the Australian economy is an enormous and expensive task the like of which the country has never experienced. Many of the technologies to progress this are already proven and well established (eg, solar, wind, batteries, Pumped Hydro Energy Storage (PHES), biomethane and electric vehicles). The AEC is technology neutral and views green hydrogen production and deployment as a developing technology that has the potential to decarbonise some of the hardest to abate sectors and is supportive of efforts to pursue this.

The AEC is supportive of a national strategy to guide the development of hydrogen such that scarce capital resources are not allocated to inefficient uses of hydrogen that results in higher abatement costs than would otherwise be the case. As this will slow the transition and increase its cost and it will be consumers and taxpayers that will bear these costs.

From the perspective of the NEM, the AEC sees a role for hydrogen but notes the cost is extremely prohibitive within the current technological envelope. Nevertheless, as the technology improves and costs reduce, hydrogen may be able to provide firming capacity in similar manner to batteries. The AEC believes that the National Hydrogen Strategy needs to ensure there is scope for more sophisticated operational models that increase the optionality that green hydrogen can offer. One such approach involving ammonia production is discussed in more detail in our response to Question 1.

Consideration should also be given to carbon minimisation where it is still impractical to fully decarbonisation. One such example is green methanol production.¹ There is likely to be unmet demand from the shipping industry for this low carbon fuel that will replace the burning of highly emitting bunker fuel. For example, Maersk has ordered six methanol powered cargo vessels and the global order book currently stands at 100.²

With respect to transportation, electric vehicles appear to be the logical solution. And even for larger vehicles this is likely to be the case. However, for high energy haulage as the technology improves hydrogen may be the solution. For other diesel usage such as remote generation, non-grid located farming applications and off-road transport, bio diesel may be the solution.

¹ <https://www.iberdrola.com/about-us/what-we-do/green-hydrogen/green-methanol>

² <https://www.maersk.com/news/articles/2023/06/26/maersk-orders-six-methanol-powered-vessels>

The AEC does not support hydrogen mandated targets or requirements on retailers or generators to either use or purchase certificates to satisfy these requirements. And the AEC does not support hydrogen blending in gas distribution networks or transmission pipelines and we have opined on this in numerous submissions and reports.³

The AEC is keen to be involved in the development of Australia's National Hydrogen Strategy and the pathway to decarbonisation. We believe we can assist government in developing the most cost effective and productivity enhancing approach to decarbonisation and would welcome further engagement with policy makers.

Please see below our responses to the questions in the Consultation paper

How can Australia enable decarbonisation through the development of a clean hydrogen industry?

1. Is prioritising the decarbonisation of ammonia production the most prospective way to achieve both hydrogen industry growth and industrial decarbonisation in the short-term?

The AEC supports prioritising decarbonising ammonia for the reasons provided in the Consultation paper. However, the AEC believes there are also other compelling reasons for targeting ammonia production. Co-locating an electrolyser with an ammonia plant can offer benefits for the NEM through firming and demand response plus other downstream industries such as fertiliser, methanol, steel, alumina, cement and explosives production can co-locate.

Ammonia has a value in Australia and is a globally traded commodity. There is significant demand in Australia and ammonia is a readily exportable commodity in contrast to bulk liquid hydrogen export. If an ammonia production facility is paired with an electrolyser it expands the scope for demand response. For example, if there are high prices in the NEM that significantly exceed the value of ammonia production and any costs associated with ramping down the plant, it can offer demand response. Although it needs to be noted that there are currently technical limits on the level of ramp up and down capability. When the ammonia plant is producing it is creating a valuable tradeable commodity.

Furthermore, co-locating an electrolyser with an ammonia plant has the potential to reduce the amount of costly large scale hydrogen storage infrastructure.

2. What other actions in the other sectors, will have the greatest decarbonisation impacts?

See Question 3 response.

3. What sectors are best placed to be early adopters of hydrogen?

Industrial heat appears to be a likely candidate for hydrogen use. This is demonstrated by the ARENA project to reduce gas usage in the calcination process for creating alumina. The AEC believes that no sector should be favoured rather industry and researchers should be allowed to identify the sectors

³ <https://www.energycouncil.com.au/media/tqvnbylk/20211126-aec-energy-officials-extending-gas-reg-framework-consult-paper.pdf>
<https://www.energycouncil.com.au/media/okwh4bog/20210816-aec-infrastructure-vic-towards-2050-gas-and-zero-emissions-final.pdf>
<https://www.energycouncil.com.au/media/3espt34d/20210806-aec-submission-vic-gas-substitution-roadmap-consultation-paper.pdf>
<https://www.energycouncil.com.au/media/dm2dkic3/aec045-hydrogen-discussion-paper.pdf>

that offer the most efficient means of decarbonising. There is scarce capital available, and this must be allocated to the sectors that offer the most immediate and cost-effective abatement.

4. Are there specific barriers that may limit hydrogen uptake in each of these sectors?

For example: are there particular infrastructure needs to enable hydrogen to contribute to grid resilience? what supply chain risks need to be addressed and overcome? Is specific regulation needed to ensure hydrogen can assist in the decarbonisation of the heavy transport sector? Is further planning needed before Australian ports can increase their share of bunkering for international shipping? Or, are specific incentives needed to rapidly switch to hydrogen powered generators at remote community and mine sites?

As stated in our response to Question 3 above, Industrial heat appears to be a likely candidate for hydrogen use. However, industrial users of hydrogen have advised that some of the current barriers to uptake is the cost of capital (for conversion of fuel burning equipment to burn hydrogen), production downtime for plant conversion and the triggering of Major Hazard Facility classification of the industrial facility due to hydrogen storage on site.

Methanol may negate the need for bunker fuel storage, but methanol storage would be required. Further, to this the question appears counterintuitive in that it implies shipping green hydrogen or ammonia would require highly emission intensive bunker fuel powered ships. With respect to remote power, the AEC has suggested biodiesel as a possible option and hydrogen may have a role in heavy duty transport applications. -.

5. What are the actions required to overcome those barriers and realise the opportunities?

For instance, what supply chain risks need to be addressed and overcome?

No comment.

How could Australia further activate its hydrogen and related industries?

6. Should Australian governments adopt a more sector driven approach to hydrogen industry development?

If based on economics and the intertemporal cost of CO₂ abatement the AEC would support this.

Targets and mandates

7. Should Australian governments adopt national hydrogen production, use and/or export targets for hydrogen?

As stated previously the AEC adopts a technology neutral approach to decarbonisation and subsidising hydrogen through use and/or export targets (ie, artificially creating demand and creating compliance obligations) is a clear example of violating this principle. It will distort the market and provide hydrogen with an advantage over other existing and emerging decarbonisation solutions. The AEC has previously raised similar concerns with the proposed WA Renewable Hydrogen Target.⁴

Australia already has emissions reduction targets and the AEC believes the best way to achieve these is for each sector to decarbonise in the most effective way deploying the most cost effective solutions.

⁴ <https://www.energycouncil.com.au/media/o0rnurfs/20221102-aec-submission-on-renewable-hydrogen-target-rev-a.pdf>

The AEC considers hydrogen production, use and/or export targets to be counterproductive for decarbonisation and does not support them.

8. If targets are adopted, what type of activities and/or sectors should this target be tailored towards? For example, production targets, demand targets for sectors such as transport or a renewable gas target. Please describe how such targets would attract investment.

See Question 7 response.

9. Should Australian governments use regulatory mandates to drive demand for hydrogen? If mandates were adopted, what type of activities and/or sectors could mandates be directed towards? Please describe how such mandates would attract investment.

Firstly, the AEC is not sure what type of hydrogen is being referred to, is it green, blue or grey? The suggestion of mandates for a product that has limited demand opportunities appears to be a reversion to the classical economics Say's Law.⁵ However, Say's Law is based on the market identifying new sources of demand and there being a productive use for that product to create another product. This contrasts with a government mandated demand for hydrogen when there are no products that can be produced economically from the mandated hydrogen. All it would achieve is higher costs for consumers. Accordingly, the AEC does not support mandates for hydrogen.

Addressing Supply Chain Risks

10. What are the most significant supply chain barriers being faced by Australia's hydrogen industry? Where should Australian governments focus efforts on securing elements of supply chains needed to enable the accelerated growth of the hydrogen sector?

No comment.

11. Should Australia develop and support local manufacturing capabilities to secure the hydrogen supply chain? What are the specific areas of opportunity (e.g. fuel cell or electrolyser manufacturing or hydrogen transportation related manufacturing)?

If the economics are favourable, then industry will produce these items locally.

12. What are the barriers to developing and supporting local manufacturing capabilities?

No comment.

13. What is the role of industry and governments to ensure the hydrogen industry has access to an appropriately sized and skilled workforce?

No comment.

How can we ensure our hydrogen industry attracts the necessary investment?

14. In addition to electrolyzers, where do you see a role for domestic hydrogen related manufacturing to address supply chain risks and ensure Australia meets its decarbonisation targets such as hydrogen buses/heavy vehicles?

As noted in our covering letter, the AEC believes electric vehicles are an effective way to decarbonise transportation but hydrogen's fast refuelling may make hydrogen appealing for commuter transport (buses and ferries) where they refuel at centralised depots or berths.

⁵ Say Jean-Baptiste, A Treatise on Political Economy (Traité d'économie politique, 1803).

15. What in addition to the commercial cost gap is preventing Australian hydrogen projects progressing beyond a financial investment decision?

Alternative rationally determined decisions to invest in other projects.

16. What signals are effective overseas and can apply to unlock greater investment?

The AEC would refer the reader to the Productivity Commission's Trade and Assistance Review which includes a considerable amount of commentary on the Inflation Reduction Act and other noted expansions of industrial policy from both the US and EU.⁶ The Productivity Commission cautions that any attempt to emulate or counter the IRA would not be beneficial for a small open economy such as Australia. Indeed, to do so would likely result in a 'net negative' for Australia.

17. Are there any other measures needed to unlock investment in the development of the Australian hydrogen industry including from international and Australian institutional investors?

The introduction of the US Inflation Reduction Act and particularly the 'Buy American' provisions within its fine print, has created a global competition for capital. Should Australian projects be too slow to come to fruition (due to lack of decisive policy or sufficient funding to close the commercial gap), prospective investors will spend their money elsewhere.

18. When would it be appropriate to take a 'tech neutral' approach to developing hydrogen, and when would a more directed approach be warranted?

The AEC supports technology neutral decisions for decarbonisation.

19. What further regulatory work is required as we accelerate the development of the hydrogen industry? What barriers do you currently see?

No comment.

How can we ensure our hydrogen industry develops in a way that benefits all Australians?

20. What actions do you view as being critical to build and maintain community support for Australia's developing hydrogen industry?

Provide consumers with the facts concerning the costs of abatement and the impacts policies will have on their energy costs.

21. How should the interests of the emerging hydrogen industry with respect to water security be balanced with other users?

Australia is the driest continent on the planet and fresh water is a scarce resource, therefore water should be sourced and used as sustainably as possible.

22. How else can Australian governments ensure that First Nations communities are resourced to effectively participate, benefit and be empowered by the development of the hydrogen industry?

No comment.

23. Is there more information that the communities including First Nations communities would like to receive about the renewable energy and hydrogen sector? What information should be provided?

⁶ <https://www.pc.gov.au/ongoing/trade-assistance/2021-22/tar-2021-22.pdf>

No comment.

24. What regulatory barriers will become more prominent as we accelerate the development of the hydrogen industry?

No comment.

25. What market conditions would indicate the need for a hydrogen reserve, price cap or other fuel security measures?

The AEC finds this question somewhat out of scope as there is currently no hydrogen industry and the timeline for such an industry to become a critical component in supplying essential services is well into the future. Nevertheless, as a matter of principle the AEC does not support price caps.

26. How can Government/s ensure that the early strong investment in the sector transitions to government revenue as the sector matures?

If the government is providing funding to hydrogen developments, then consideration should be given to the government receiving equity in the projects.

How should we develop the necessary infrastructure needed to support the development of our hydrogen industry?

27. How can the National Hydrogen Infrastructure Assessment be delivered to maximise the value to governments and industry?

For example, the existing approach could be repeated or alternatively specific infrastructure issues such as water supply and treatment, storage, hydrogen pipelines could be given particular attention.

As stated previously, these matters must be considered through the lens of intertemporal cost of abatement. Failing to do this will unnecessarily reduce Australian productivity and constrain future economic growth.

28. How can Australian governments ensure the efficient use of existing infrastructure, and delivery of new infrastructure, including common user infrastructure?

No comment.

29. How should the infrastructure needs of the hydrogen industry be balanced with other infrastructure users e.g electricity generation?

The electricity sector has and is the primary emissions reduction sector. The further decarbonisation of this sector is critical to ensure the hydrogen sector has access to low cost renewable energy or at the very least with a very low emissions intensity. In consideration of a situation where the priorities of hydrogen and electricity clash any assessment needs to be conducted through the lens of which sector is providing the most intertemporally cost-effective reduction in emissions. Intertemporal is referred to here because an ongoing tonne of CO₂ abatement today is more valuable than one in 2030.

30. What are the trade-offs (or synergies) of developing a hydrogen industry with other government goals?

For example, the growth of the hydrogen sector may present trade-offs regarding the prioritisation of the 82% national renewable electricity target, or competition for existing water infrastructure.

However, hydrogen also presents an opportunity to enhance grid stability and could contribute positively to regional water security issues through the development of shared infrastructure.

All need to be considered synergistically and as noted previously the optimal economic outcome needs to be achieved. However, the absence of a market determined price on carbon makes this challenging.

Existing gas infrastructure

31. How can existing gas infrastructure be repurposed to address priority use cases for hydrogen?

Natural gas (and possibly biomethane) will continue to be an important part of the Australian industrial landscape and gas-powered generation (GPG) will be particularly important for firming and back up in the NEM. Hence, gas transmission infrastructure and in particular transmission is likely to be required for this purpose. New transmission pipelines are likely to be required for hydrogen.

How can we enable a hydrogen export industry (including the export of goods manufactured with hydrogen)?

32. How can agreements with other nations best support rapid growth to Australia's hydrogen industry?

Recognised and monetary benefits accrue to green hydrogen production.

33. How should Australia ensure that the necessary foreign investment in hydrogen industry, and export projects leads to lasting benefits for all Australians?

Ensure that Australia does not undertake uneconomic investment that jeopardizes the nation's productivity.

Other feedback

34. What other issues should Australian governments consider in relation to revising the National Hydrogen Strategy?

No comment.

Any questions about this submission should be addressed to Peter Brook, Wholesale Policy Manager by email to peter.brook@energycouncil.com.au or by telephone on (03) 9205 3103.

Yours sincerely,



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