

3 August 2023

Hydrogen Headstart Consultation
Department of Climate Change, Energy, the Environment and Water
King Edward Terrace
Parkes
ACT 2601

RE: HYDROGEN HEADSTART CONSULTATION | CONSULTATION PAPER

The Australian Petroleum Production and Exploration Association (APPEA) welcomes the opportunity to provide comment and recommendations on the *Hydrogen Headstart Consultation Paper* July 2023.

APPEA strongly recommends a technology neutral, emissions-intensity focussed approach to low-carbon hydrogen development in Australia. Analysis from the International Energy Agency (IEA), the Intergovernmental Panel on Climate Change (IPCC) as well as the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and others, is clear: all low-carbon hydrogen pathways – including renewable-based hydrogen as well as low-carbon hydrogen produced from natural gas with carbon capture, utilisation and storage (CCUS) – have a role to play in the development of a low-carbon hydrogen industry and in reaching net zero globally. The different low-carbon hydrogen pathways are likely to be complementary, with the balance between pathways changing from region-to-region, and over time based on factors such as costs and resource availability. Limiting the Hydrogen Headstart program to renewable-based low-carbon hydrogen only risks constraining the ability of the program to meet its objectives by:

- Increasing the cost of low-carbon hydrogen produced in Australia; reducing the emissions reductions that can be achieved per dollar invested;
- Limiting the volume of low-carbon hydrogen produced; reducing the opportunity to grow low-carbon hydrogen demand and develop a domestic hydrogen industry; and
- Placing Australia at a competitive disadvantage globally with respect to the export of low-carbon hydrogen and associated products.

Hydrogen Headstart program objectives: *produce renewable hydrogen at scale; support domestic decarbonisation; facilitate an accelerated pathway to the technical and commercial viability of renewable hydrogen production at scale in Australia.*

Low-carbon hydrogen produced from natural gas with CCUS is the lowest cost and most technologically advanced pathway to low-carbon hydrogen, delivering significantly more emissions reductions per dollar today. Low-carbon hydrogen from natural gas with CCUS is expected to be two to six times cheaper than renewable-based hydrogen per kilogram of low-carbon hydrogen produced today^{1,2} – meaning up to six times more emissions reductions per dollar today depending on the emissions intensity of the low-carbon hydrogen produced. Further, natural gas with CCUS is the most technologically advanced and widely deployed pathway to low-carbon hydrogen, meaning it has the ability to scale up faster in the near-term, to facilitate other low-carbon hydrogen pathways as they

¹ CSIRO National Hydrogen Roadmap

² IEA CCUS in Clean Energy Transitions

scale up and costs come down. The IEA estimated there is around 650,000 tonnes of low-carbon hydrogen produced per year today of which 92% is produced using natural gas with CCUS, 5% is produced from bioenergy, with the remaining 3% produced from wind and solar.³ By limiting the Hydrogen Headstart program to renewable-based hydrogen only, the cost of low-carbon hydrogen produced under the program is likely to be increased and the amount of emissions reductions that can be achieved by the program is, potentially significantly, decreased.

Hydrogen Headstart program objectives: *facilitate an accelerated pathway to the technical and commercial viability of renewable hydrogen use at scale in Australia; develop and retain investment, skilled labour, intellectual property and supply chains for a domestic hydrogen industry; build industry capability and provide for new economic opportunities in our manufacturing industries.*

A technology neutral, emissions intensity-focused approach can be expected to enable more hydrogen to be produced, and at a lower cost, supporting growth in low-carbon hydrogen demand and the development of a domestic low-carbon hydrogen industry. Key to the development of a low-carbon hydrogen sector in Australia is the fostering of low-carbon hydrogen demand and the roll-out of hydrogen infrastructure, in parallel with the development of low-carbon hydrogen supply. The Hydrogen Headstart program supports low-carbon hydrogen production, with demand only encouraged through subsidising the low-carbon hydrogen produced. Excluding the most technologically advanced and lowest-cost pathways to low-carbon hydrogen production can be expected to increase the cost and reduce the volume of the hydrogen produced which in-turn creates a barrier to entry for manufacturers and industry looking to utilise low-carbon hydrogen, limiting the demand, skills and supply chain infrastructure that will be generated by the program.

Further, the development of low-carbon hydrogen from natural gas with CCUS supports the development of CO₂ transport and storage infrastructure which can be leveraged to support the decarbonisation of other existing facilities and hard-to-abate industries where low-carbon hydrogen is not a decarbonisation pathway, such as cement production. The development of shared CO₂ transport and storage infrastructure can also underpin the deployment of CO₂ removal – negative emissions – technologies such as direct air CO₂ capture (DACC) and bioenergy with CCUS (BECCS).

Hydrogen Headstart program objective: *build industry capability and provide for new economic opportunities in our export industries.*

Low-carbon hydrogen policies in key global markets are inclusive of a range of low-carbon hydrogen pathways – including lower-cost hydrogen from natural with CCUS – which risks placing Australia at a competitive disadvantage. Countries and regions around the world are competing to scale up their low-carbon hydrogen industries, with an eye on future international trade of low-carbon hydrogen and low-carbon hydrogen derived products. By taking a technology neutral approach, key energy market players are looking to reduce the cost of low-carbon hydrogen and associated products and maximise the volume of low-carbon hydrogen produced, increasing their international competitiveness – the production of low-emissions steel and ammonia from higher-cost hydrogen will result in higher cost steel and ammonia than that produced using lower cost low-carbon hydrogen pathways. The United States Inflation Reduction Act provides up to US\$3/kg of hydrogen produced based on the emissions intensity of the hydrogen produced, without picking specific low-carbon hydrogen pathways or excluding others. Countries in the Middle East are expected to be some of the lowest cost low-carbon hydrogen producers globally – with hydrogen from natural gas with CCUS able to be produced at a cost of as low as US\$1/kg today.⁴ The United Arab Emirates have already supplied low-carbon hydrogen

³ IEA World Energy Outlook 2022

⁴ IEA The Future of Hydrogen – Seizing today's opportunities

cargos produced from natural gas with CCUS to Japan.⁵ Australia risks putting itself at a competitive disadvantage if potentially lower-cost low-carbon hydrogen pathways are taken off the table.

The oil and gas sector is central to the development of low-carbon hydrogen globally, including both renewable-based hydrogen and low-carbon hydrogen produced from natural gas with CCUS. The oil and gas sector is one of the primary producers and users of hydrogen today and will be a critical demand centre for low-carbon hydrogen going forward. The oil and gas sector also has the technical and commercial skills and experience necessary to scale up and commercialise low-carbon hydrogen production. The IEA highlight that 80% of all large-scale renewable-based hydrogen projects today are being developed by the oil and gas industry or with the oil and gas industry as the offtaker.⁶ The oil and gas sector is also central to the development of low-carbon hydrogen from natural gas with CCUS, both from a gas production perspective as well as being the industry with the experience in developing and deploying CCUS.

APPEA and its members welcome the opportunity engage further on Australia's approach to low-carbon hydrogen development and on the Hydrogen Headstart program.

Yours sincerely,



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Chief Executive

⁵ www.japantimes.co.jp/news/2021/08/19/business/corporate-business/uae-blue-ammonia-japan

⁶ IEA World Energy Outlook 2022