appea the voice of australia's oil and gas industry

Submission

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# A Hydrogen Guarantee of Origin scheme for Australia: discussion paper

## CONTENTS

## INTRODUCTION

The Australian Petroleum Production & Exploration Association (APPEA) is the peak national body representing Australia's oil and gas exploration and production industry. It has more than 60 full member companies. These are oil and gas explorers and producers active in Australia. APPEA members account for around 95 per cent of the nation's petroleum production. APPEA also represents around 140 associate member companies that provide a wide range of goods and services to the upstream oil and gas industry.

APPEA works with Australian governments to help promote the development of the nation's oil and gas resources in a manner that maximises the return to the Australian community and industry. APPEA aims to secure regulatory and commercial conditions that enable member companies to operate safely, sustainably, and profitably. Further information about APPEA can be found on our website, at www.appea.com.au.

APPEA welcomes the opportunity to provide comment on the *A Hydrogen Guarantee of Origin scheme for Australia: discussion paper* (the discussion paper) released on 21 June 2021.

In addition to this submission, a number of APPEA members have made individual submissions on the draft decision paper. This response should be read in conjunction with submissions from individual APPEA members.

APPEA's submission addresses specific aspects of the discussion paper, focussing on those areas that are particularly important for the upstream oil and gas industry.

## THE AUSTRALIAN UPSTREAM OIL AND GAS INDUSTRY

It is important to place our views on the issues raised in the draft discussion paper and the role the upstream oil and gas industry can play in hydrogen development in Australia and the specific issues around a hydrogen guarantee of origin (hydrogen GO) scheme within the context of the current state and potential future contribution of the upstream oil and gas industry to the Australian economy and to the welfare of all Australians.

Reliable, secure and competitively priced energy is crucial to our everyday lives in Australia. Within this framework, oil and gas plays a key role in meeting many of our energy needs. Australia's oil and gas industry is a key and ongoing contributor to the Australian economy. The industry:

- Invested an estimated $473 billion in the Australian economy, including around $305 billion invested in Australian LNG projects, since 2010[1].

[1] See Wood Mackenzie (2020), *Australian Oil and Gas Industry Outlook Report*, page 4 (available at Australia-Oil-and-Gas-Industry-Outlook-Report.pdf (appea.com.au)).

    - This investment will deliver returns for Australia for decades to come, through increased gas supply for Australian customers, export revenue, jobs, royalties and taxes.
- Supports around 80,000 jobs directly and indirectly in Australia and hundreds of thousands more in the manufacturing sector rely upon natural gas.
- Paid more than $5.3 billion in wages to direct employees in 2016-17. The industry's average wages are more than double the national average.
- Supports a vast supply chain of businesses in manufacturing, services and construction.
    - This is in addition to the hundreds of thousands of jobs in electricity generation, manufacturing, transport and other industries which rely on our outputs.
    - Businesses ranging from national firms to local cafés all share in the economic benefits generated by the upstream oil and gas industry[2].
- Contributed nearly 4 per cent of Gross Domestic Product (GDP) in 2019-20, an increase from around 3 per cent in 2018-19.

Maintaining this ongoing and multi-billion dollar contribution will be vital as Australia looks to its ongoing recovery from the economic and social challenges posed by the COVID-19 global pandemic.

Liquefied natural gas (LNG) is now one of Australia's largest commodity exports, with export revenue of around $51 billion in 2018-19 and $48 billion in 2019-20. While export revenue is expected to decline on the back of falls in the price of LNG in 2020-21, volumes have been maintained and continue to supply export revenue for Australia. The Department of Industry, Science, Energy and Resources expects exports earnings to increase to $49 billion in 2021-22[3].

One of the measures of the contribution made by the oil and gas industry to the Australian economy, and to the economic welfare of all Australians, is the investments made by the industry since 2010. The industry has invested between $US20-$US55 billion (around $A26-$A72 billion at current exchange rates) every year over the period 2010-2020, and at times during this period, was directly responsible for nearly half of annual Australia's economic growth[4].

No other single industry has made this contribution to Australia's growth and investment during the last decade. This means that the stakes are high in realising the industry's potential benefits. The issues raised in the discussion paper can play a role in determining whether the industry can realise its potential and whether or not the Australian economy benefits from new upstream oil and gas investment opportunities, particularly as they relate to future hydrogen developments.

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[2] As an example, work for APPEA in 2019 by Lawrence Consulting found the industry contributed around $55 billion to Queensland's economy over a seven-year period. Almost $5 billion was spent on wages state-wide with the industry employing around 4,600 full-time employees, according to the *Economic Impact of Queensland's Petroleum and Gas Sector 2011-18* report. The industry spent around $50 billion on goods and services from local community contributions and payments to local government as well as royalties, stamp duty and tax. See Natural gas powering Queensland's economy | APPEA for more information.

[3] See Resources and Energy Quarterly (industry.gov.au) (page 64) for more information.

[4] For example, in its August 2017 *Statement on Monetary Policy*, the RBA found: *"LNG exports are expected to contribute almost ½ a percentage point directly to annual GDP growth"*, confirming the ongoing and significant contribution LNG exports have made and continue to make to sustaining economic growth in Australia. See Statement on Monetary Policy – August 2017 | RBA, page 33 for more.

## NATURAL GAS IS A PATHWAY TO A LARGE-SCALE AND INNOVATIVE COMMERCIAL HYDROGEN INDUSTRY

An Australian hydrogen industry and a local market could generate significant opportunities for the country. Australia's upstream oil and gas industry is well placed to assist in the development of one of the pathways[5] to a large-scale and innovative commercial hydrogen industry. This is both in using natural gas to produce hydrogen and using gas infrastructure to process and transport hydrogen.

Australia's LNG export success story means the Australian upstream oil and gas industry has the technology, expertise, commercial and trade relationships to make, in particular, hydrogen exports a reality. This means Australia is well placed to capitalise on our already abundant natural advantage.

Hydrogen is already being produced from Australian LNG exports. In addition, hydrogen projects using steam methane reforming (SMR) of natural gas with CCS are already in operation around the world[6].

Developing a local hydrogen industry could enable lower emissions both in Australia and internationally, reduce energy costs, deliver energy security, together with new employment and manufacturing opportunities.

A hydrogen GO scheme can play an important role as one of the key pieces of regulatory and policy architecture that can help underpin the development of a hydrogen industry in Australia.

## GENERAL COMMENTS ON THE DISCUSSION PAPER

At a high level, the approach to developing and piloting the proposed hydrogen GO scheme appears appropriate. APPEA in particular supports a technology neutral approach to scheme development and one that focusses on hydrogen development and emissions reduction as the core points of focus, rather than a focus on particular hydrogen development pathways.

APPEA also supports, as is highlighted in the discussion paper on page 6, an approach that would draw where possible on existing measurement and reporting frameworks, such as the National Greenhouse and Energy Reporting scheme (NGERs) which has just been updated[7], following a public consultation process, in a range of areas relevant to hydrogen, carbon capture and storage

[5] Alongside hydrogen production from renewable energy sources, where Australia also has significant opportunities.
[6] For example, the Quest (Canada, see Quest Carbon Capture And Storage | Shell Canada) and Port Arthur (USA, see Carbon Capture (airproducts.com)) projects couple hydrogen production from steam methane reforming with CCS.
[7] Amendments were recently made to the *National Greenhouse and Energy Reporting Regulations 2008* and *National Greenhouse and Energy Reporting (Measurement) Determination 2008* to introduce a new method and provide reporting guidance for hydrogen production facilities whose primary product is hydrogen for use outside of the facility, expand on the method for estimating fugitive emissions from the transport and injection of greenhouse gases for CCS and update methods for estimating fugitive emissions from oil and natural gas facilities to reflect the latest available research and reflect the results of Leak Detection and Repair programs.

(CCS) and upstream oil and gas building on existing reporting arrangements that are already established in NGERs.

APPEA also supports the proposal to use feedback to design and then run a pilot scheme to test various elements on hydrogen GO scheme design and the associated regulatory and administrative architecture for such a scheme. APPEA recommends as wide of range of projects and hydrogen development pathways as possibly be included in any pilot that follows this consultation process.

## COMMENTS ON SPECIFIC ASPECTS OF THE DISCUSSION PAPER

The following sections consider a number of the questions raised by the Department in the discussion paper.

As noted above, APPEA's submission addresses specific aspects of the discussion paper, focussing on those areas that are particularly important for the upstream oil and gas industry. As such, APPEA has not provided an answer to every question posed in the discussion paper. Also as noted above, in addition to this APPEA submission, a number of APPEA members have made individual submissions on the discussion paper. The responses set out below should be read in conjunction with submissions from individual APPEA members.

### INTRODUCTION

**Why do we need a Guarantee of Origin scheme for hydrogen?**

APPEA supports the comments made on page 9 of the discussion paper that a hydrogen GO scheme, particularly one that is consistent with international approaches[8], can play a role in facilitating efficient international trade and enabling informed choice for domestic and export consumers.

**International context**

APPEA also supports the approach taken by International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) members, including Australia, outlined on page 13 of the discussion paper as:

> *… aligned in considering that a hydrogen GO scheme should included all technologies to produce clean hydrogen.*

As noted above, APPEA supports a technology neutral approach to scheme development and one that focusses on hydrogen development and emissions reduction as the core points of focus, rather than a focus on particular hydrogen development pathways.

[8] For example, through the work of the IPHE and its Hydrogen Production Analysis Taskforce (H2PA).

**Design approach**

Of the three design approach options sets out on page 15 of the discussion paper, APPEA agrees that Option 3 appears to provide the most appropriate way forward, drawing on the IPHE experience and allowing for timely progress in developing a hydrogen GO scheme.

## SCHEME DESIGN, COVERAGE AND ADMINISTRATION

**Coverage of products**

1. *An initial focus on hydrogen production is proposed to facilitate timely establishment of a hydrogen GO scheme. Do you agree with this as a starting point?*

APPEA notes the feedback provided on page 16 that the scheme should create a consistent framework to support a range of low emissions technologies, but should initially focus on hydrogen production in order to allow timely establishment of the scheme. This could be expanded over time to cover additional products.

**Coverage of production pathways**

APPEA supports the position set out on page 16 of the discussion paper that:

> *… the Government considers all technologies for producing clean hydrogen should be covered, however a methodology needs to be established before they can be included. This paper presents methodologies for consultation for the three main production pathways relevant to Australia, electrolysis, coal gasification with CCS and SMR of natural gas with CCS.*

Noting that, globally, SMR of natural gas is the most widely used hydrogen production technology and that is likely to continue alongside CCS developments.

It is also the case that while the discussion paper proposes they not be covered by a hydrogen GO scheme, a broader range of offsets, beyond CCS, also provide a way to produce hydrogen with net zero emissions.

**The system boundary**

2. *A well-to-gate boundary is proposed as the initial boundary across which the emissions are to be calculated for hydrogen GO scheme. Do you agree this is an appropriate and acceptable starting point for the boundary?*

While the discussion paper notes on page 18 that stakeholders and international schemes such as the CertifHy scheme believe well-to-gate is the preferred method, APPEA notes only hydrogen produced from natural gas SMR with CCS (and coal gasification with CCS) are currently planned to be measured this way under the emission sources listed in the discussion paper.

While natural gas will be required to report its upstream, gas processing, compression, CCS and hydrogen processing related emission amongst others (a true "well-to-gate" approach) hydrogen produced from electrolysis is only required to report the electricity emissions related to production at site. This proposed methodology is akin to a "gate-to-gate" system boundary for hydrogen produced by electrolysis. The effect of this different approach to reporting/measurement will be advantage one source over another. As noted above, APPEA recommends in all cases a technology neutral approach should be a foundation principle of any hydrogen GO scheme and as a result the scheme must demonstrate a common approach to system boundaries for all production pathways.

For this to occur, and for hydrogen produced by electrolysis to be directly comparable in a well-to-gate boundary scenario, APPEA recommends the following be added (as a minimum):

- Emissions from upstream fuel used in the electricity mix (including emissions producing coal and gas).
- Line losses to transport the electricity to site.
- Emissions from compression activities to increase the pressure to the required 3MPa.

The alternative way to ensure an equivalent assessment can be made between the different production pathways would be to utilise the gate-to-gate approach to all production and only report information from the hydrogen generation facility. This system boundary approach closely aligns with current NGERs methodology.

**Carbon accounting frameworks**

5. *Do you agree that ISO standards and the GHG protocol provide the appropriate basis for the overarching framework for a hydrogen GO scheme?*
6. *Should IPCC Guidelines, the NGERS determination and the Climate Active Electricity Accounting rules be leveraged to provide guidance on the detailed emissions calculations?*

APPEA notes the approach proposed on page 20 of the discussion paper to use International Organization for Standardization (ISO) standards and the Greenhouse Gas Protocol (GHG Protocol), along with IPCC and NGERs and Climate Active as the basis for developing the hydrogen GO scheme. This appears appropriate, particularly drawing on the existing approaches in NGERs for emissions measurement and reporting.

**Treatment of offsets**

7. *What is your preferred approach to offset inclusion within a domestic hydrogen GO scheme?*

APPEA supports option 2 as set out on page 21 of the discussion paper, that is, that ACCUs from all registered ERF projects be used to reduce the emissions from hydrogen production, effectively creating carbon neutral hydrogen. Given the size of the ACCU market, the hydrogen GO scheme could also over time consider a broader range of offset options.

Any hydrogen produced should then be able to find its way in the market, that is, the extent to which international buyers may accept such as approach can be determined by the market, through commercial arrangements between buyers and sellers. The Australian Government can support the operation of the market by advocating for an approach consistent with option in any relevant international negotiations, including in IPHE discussions.

This can reduce the risk highlighted on page 21 of that

> *… Australia's scheme may end up inconsistent with international developments.*

Importantly, any such risks can be managed through normal commercial negotiations between buyers and sellers.

**Scheme governance and administration**

8. *Do you agree that the Australian government should lead the administration of an Australian GO scheme? If not, why not?*
9. *Do you agree that the scheme should be administered by the Clean Energy Regulator?*
10. *What should be the role of industry in co-designing a government led scheme?*

The proposal that the Australian government should lead the administration of an Australian hydrogen GO scheme and that the scheme be administered by the Clean Energy Regulator are both appropriate.

That said, industry has a key role to play in the co-design, pilot and ongoing development of the hydrogen GO scheme. The Regulator's co-design approach, used as part of the Emissions Reduction Fund (ERF) Method development process, provides a useful and relevant example of the way in which this co-design process can work. In a similar way, the Emissions Reduction Assurance Committee (ERAC) process provides an additional and relevant example of a joint industry-government approach to the administration and strategic oversight of the ERF Method process and lessons from the ERAC process could inform a similar approach to the administration and strategic oversight of a hydrogen GO scheme.

**Regulatory framework**

11. *Do you support the creation of Australia's hydrogen GO scheme as a certificate scheme?*

The proposed approach outlined on pages 22-23 of the discussion paper to develop the hydrogen GO scheme as a certificate scheme appears appropriate.

In addition, the proposal to develop a new certificate-based scheme for pre 2030 "below baseline" renewable generation and post 2030 for all renewable energy appears appropriate. However, the development of a new certificate scheme may have implications for the current Large-scale Generation Certificate (LGC) market including the voluntary market. These should be carefully considered before a new certificate scheme is designed. APPEA recommends

consultation with all relevant stakeholders from the LGC market to explore these implications would be beneficial.

12. *What would you consider to be the best regulatory framework to support a hydrogen Guarantee of Origin scheme?*

As noted earlier, the hydrogen GO scheme should, wherever possible and appropriate, leverage existing legislative, regulatory and policy frameworks. While APPEA does not have a strong preference for either standalone legislation or adapting existing legislation, adapting existing legislative and regulatory frameworks in a way that does not disrupt their core functions or existing operations, may be an efficient way to establish a hydrogen GO scheme in a timely manner. As the discussion paper notes on page 24, this could be through amendments to the *National Greenhouse and Energy Reporting Act 2007*, new regulations as part of the *National Greenhouse and Energy Reporting Regulations 2008*, and amendments to the *Australian National Registry of Emissions Units Act 2011.*

## CARBON ACCOUNTING METHODOLOGY

**Emissions sources**

The discussion paper outlines in Box 1 on pages 26-27 the three hydrogen production pathways. In relation to "steam methane reporting with CCS", the discussion papers on page 27:

> *Other significant emissions sources include the fugitive emissions and combustion emissions associated with upstream gas extraction and processing, as well as the electricity use associated with $CO_2$ removal.*

It is important to note that the coverage of each of these emission sources under NGERs is comprehensive – each of these emissions sources are measured and reported to the Regulator under the Act and are publicly available through the Regulator's NGER data release process. In relation to these emission sources, no new or additional reporting arrangements are required.

**Methodologies for estimating scope 1 emissions**

15. *Do you agree with the approach set out for scope 1 emissions?*

The approach to estimating scope 1 emissions, set out on page 27 of the discussion paper, appears appropriate, leveraging IPCC and NGERs guidelines.

**Measuring upstream emissions**

16. *Do you agree with the approach set out for upstream emissions?*

As noted above, the coverage of each these emission sources under NGERs is comprehensive – each of these emissions sources are measured and reported to the Regulator under the Act and

are publicly available through the Regulator's NGER data release process. In relation to these emission sources, no new or additional reporting arrangements are required.

This would leverage the compliance and enforcement provisions in NGERS and avoid the need for extensive new legislation.

**Allocating emissions to co-products**

24. *Do you agree that emissions should be attributed to co-products where they are on-sold?*
25. *Are the by-products identified for each pathway likely to be co-products (or are they more likely to be waste products?)*
26. *Do you think that the allocation methods suggested in each pathway are appropriate and practical? How would you suggest emissions be allocated between the main product and co-products?*

As the discussion paper notes on page 40:

> *Potential co-products from the gas extraction and processing steps include natural gas liquids such as ethane, propane, butane and pentane, as well as oil and condensates. These products often co-exist with the gas extracted from the reservoir and are typically separated out from the gas stream as they attract a higher value when sold as separate products.*

Each of these products have their own regulatory and policy arrangements and commercial pathways to market. They can have different uses, different customers, and can be for either domestic use or for export use (or, in many cases, both). It is therefore appropriate that emissions be attributed to these co-products (noting that ,in relation to natural gas SMR with CCS, the by-products identified are likely to be co-products rather than waste products) where they are on-sold. APPEA notes the discussion paper on page 41 recommends allocation for these co-products be based on the proportion of energy content of the individual products.

These allocation methods should be tested during the pilot phase and a review process to ensure the allocation method is appropriate should be included in the development of the hydrogen GO scheme.

**Carbon capture, utilisation and storage**

APPEA notes the assertion on page 42 of the discussion paper that:

> *There are concerns about the risk of reversibility of carbon storage and this is particularly important in ensuring the validity of any CCS claims.*

CCS, one of Australia's priority low emissions technologies identified through the Australian Government's first *Low Emissions Technology Statement* (alongside clean hydrogen) is already well established as a safe, large-scale permanent greenhouse gas emissions abatement solution. Australia has a natural competitive advantage to implement CCS with known high quality, stable

geological storage basins, existing infrastructure, world-class technical expertise and regulatory regimes (environment protection, carbon accounting and reporting, financial services).

With scale and experience, the cost of CCS will decrease, creating the potential to deliver competitive, large-scale abatement for existing industries and new industries such as hydrogen and ammonia.

In the case of offshore activities, a comprehensive and well-established legislative, regulatory and policy regime is already in place through the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA). The Act, which is overseen by the Department and administered through the National Offshore Petroleum Titles Administrator (NOPTA) and the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) provides a comprehensive and rigorous approach to regulating CCS (greenhouse gas storage) activities[9]. Similar legislative arrangements exist onshore in a number of jurisdictions[10].

In relation to a "risk of reversability", the OPGGSA regulates site closures and long-term liability. Titleholders who wish to surrender their title can apply for consent from the responsible Commonwealth Minister through NOPTA. Before the Minister provides consent for the surrender of the title, Section 442 of the Act sets out an extensive range of criteria which must be met before consent can be given.

The comprehensive nature of the Act and its associated regulatory regime means that the "risk of reversability" is exceedingly low and, as the Clean Energy Regulatory has noted in the Draft CCS Method Guide under consultation as part of the development of a CCS Method[11]:

> *International technical assessments suggest that the risk of reversal is low and declines over time. In Australia, the risk of reversal is considered particularly low due to the characteristics of geological formations where CCS projects are likely to be located and strong regulatory frameworks.*

27. *Do you agree with an approach limiting provisions for CCS and CCUS in an initial Guarantee of Origin scheme to those included under the NGER determination, noting that these will be expanded or adjusted as new CCUS technologies and industrial processes are implemented?*

While APPEA notes the proposal on page 43 of the discussion paper to limit CCUS provisions to emissions permanently stored in geological formations until robust international accounting provisions are developed for other forms of CCUS be kept under constant and close review to ensure that such activities can be incorporated, as appropriate, into the hydrogen GO scheme in an expeditious manner.

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[9] See here for an overview of Regulating offshore greenhouse gas storage in Australian Commonwealth waters | Department of Industry, Science, Energy and Resources.
[10] Such as the *Greenhouse Gas Geological Sequestration Act 2008* (Victoria), *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Victoria), *Greenhouse Gas Storage Act 2009* (Queensland) and *Petroleum and Geothermal Energy Act 2000* (South Australia).
[11] See Carbon capture and storage method: proposed new method under the Emissions Reduction Fund - Department of Industry - Citizen Space.

**Materiality threshold**

29. *Do you agree with setting a materiality threshold allowing entities to exclude a small amount (e.g. 2.5 to 5%) of total emissions from analysis?*
30. *What would you consider to be an appropriate threshold?*

APPEA agrees that as the discussion paper notes on page 43 materiality thresholds may be helpful in managing and reducing compliance burden for scheme participants. APPEA recommends a threshold of 5% would be an appropriate level. APPEA also agrees that industry consultation and pilot studies can further determine the appropriateness of this threshold to ensure there an equitable balance between accuracy and practicality of emissions reporting.

## NEXT STEPS

31. *Is a trial phase an appropriate next step for testing and refining the proposed methodologies?*
32. *Is the list of attributes and features to be tested correct? Is there anything else that could be tested through a trial phase?*

APPEA agrees that a trial phase represents the appropriate next step for developing a hydrogen GO scheme. While APPEA would not itself be involved in a trial, it would welcome the opportunity to be involved in further consultation on refining the proposed approach and methodologies arising from the trail phase. The list of attributes and features to be tested appears to be appropriate.