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APPEA response to the Infrastructure Victoria consultation: Towards 2050: Gas infrastructure in a zero emissions economy

The Australian Petroleum Production & Exploration Association (APPEA) is the peak national body representing upstream oil and gas explorers and producers active in Australia. APPEA's member companies account for more than 90 per cent of Australia's petroleum production. Further information about APPEA can be found on our website, at www.appea.com.au.

APPEA welcomes the opportunity to provide comment to the Infrastructure Victoria's consideration and comment on its gas infrastructure interim report. APPEA's submission will limit comments to matters that directly impact on upstream production and distribution of natural gas.

Australia is a leading producer of oil and natural gas and has an abundance of resources which will last for many years to come. At the outset, APPEA and its members identify that there will continue to be demand and an ongoing requirement for the delivery of natural gas to Victoria for the foreseeable future. This has also been recognised by the Victorian Government, which while releasing its paper, *Towards 2050: Gas infrastructure in a zero emissions economy*, is also preparing for the restart of onshore conventional gas exploration and production. AEMO's March 2021 *Gas Statement of Opportunities* notes that as historically strong gas supplies from the Gippsland Basin taper off, alternative sources of supply will come on line, and that this is already occurring.

It also notes that gas is expected to play a critical role in the electricity sector over coming years, particularly during periods of low renewable energy generation.[1]

> *Gas is expected to continue to play a critical role in the electricity sector particular during periods of low VRE generation or prolonged coal-fired generation outages. While the volume of gas consumed for generating electricity is forecast to decline in all scenarios, the value of that generation is expected to increase in line with the growth of VRE and the retirement of coal generation. Over time, daily GPG demand is projected to switch to peaking in winter instead of summer.*[2]

Natural gas-powered electricity generation provides security, reliability, and affordability to the electricity grid, with half the emissions compared to coal. In Victoria this currently accounts for approximately 8.5 per cent of natural gas consumption. The use of natural gas for power generation varies over the year and in response to events with, for example, gas playing a very significant role in the period following the closure of the Hazelwood Power Station in March 2017 and the June 2021

[1] aemo.com.au/-/media/files/gas/national_planning_and_forecasting/gsoo/2021/2021-gas-statement-of-opportunities.pdf?la=en.
[2] aemo.com.au/-/media/files/gas/national_planning_and_forecasting/gsoo/2021/2021-gas-statement-of-opportunities.pdf?la=en, p.4

disruption at the Yallourn Power Station. In both cases, natural gas played a critical role in securing ongoing energy supplies for Victorians.

Even with changes in the energy generation mix and the uptake of more renewable energy, natural gas is expected to continue to play a pivotal role across the economy, both in Victoria and nationally. Natural gas is both a source of energy and an essential raw material for the manufacturing of everyday products like glass, ceramics, bricks, cement, plastic packaging for food and beverages, fertilisers, anti-freeze, metals like aluminium, copper, zinc, tin and in processes of food preparation, fermentation, and brewing. In most cases, there is no readily available substitute for gas, and unlikely to be so in the medium-term. In Victoria, industrial process heating accounts for around 30 per cent of all gas consumption, while gas as an industrial feedstock for light industry accounts for an estimated 1 per cent of total gas consumption.[3]

APPEA supports practical efforts to decarbonise the economy, and Australia is already on a pathway to reduce emissions in the oil and gas industry to help meet our nation's emission reduction commitments under the Paris Agreement on climate change. The oil and gas industry is working hard to reduce, offset and mitigate emissions in its operations.

To support government and industry efforts to reduce emissions, APPEA has a longstanding set of policy positions in relation to climate change. Since 2010 these have formed the basis of a formal set of climate change policy principles, which are reviewed every 5 years. These reviews produced a second edition in early 2016 and the third and current edition in February 2021.[4] This was supplemented with a new report, *Industry Action on Emissions Reduction*, which outlines the steps members are taking to proactively reduce their emissions profile.[5]

At their core, the principles are designed to assist policymakers in developing efficient and effective responses to deal with climate change. They also provide a framework for the industry to assess and respond to climate change policies put forward by governments and others. The full set of climate change policy principles are at Attachment 1. In summary, these cover that:

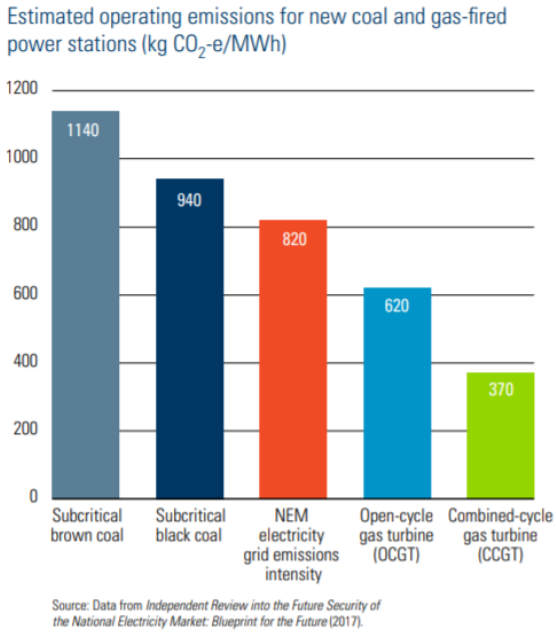
- Net zero emissions by 2050 should be the goal of policy.
- Climate policies should be integrated with economic, social, technology, energy policies.
- Maintain competitiveness of trade-exposed industries, such as LNG.
- Advance access to affordable, reliable, sustainable energy.

In response to the questions posed by the interim report, APPEA makes the following observations:

Do you have any further information, evidence or concerns that you wish to raise in relation to the scenario design and analysis?

Natural gas can and should continue to have a role as Victoria continues to decarbonise its economy. The 2017 Independent Finkel Review (p.203) shows natural gas power generation technologies can reduce emissions by 68 per cent compared to current brown coal generation technologies and by 61 per cent compared to current black coal generation technologies. By replacing higher-emitting fuels with cleaner natural gas we can substantially reduce Australia's emissions.

[3] *Gas Substitution Roadmap Consultation Paper, 2021.*
[4] See www.appea.com.au/all_news/oil-and-gas-industrys-climate-principles-support-a-cleaner-energy-future.
[5] https://appea.com.au/wp-content/uploads/2020/06/Industry-Action-on-Emissions-Reduction.pdf



Reliable, secure and competitively priced energy is crucial to our everyday lives in Australia and will continue to be for the foreseeable future.

Do you have any further information or evidence that can help identify an optimum scenario for a net zero emissions gas sector in 2050?

Carbon Capture and Storage (CCS) should be given greater emphasis under the Victorian Government's optimum scenario.

CCS is a transformational technology that can be used to reduce emissions associated with the direct use of natural gas at industrial scale including gas processing, power generation and manufacturing. CCS and carbon capture utilisation and storage (CCUS) is recognised across the world as a critical technology for meaningful emissions reduction.

CCS is internationally accepted within the United Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) as a mitigation solution, capable of delivering environmentally safe mitigation outcomes. It has been an eligible project level activity in the Kyoto Protocol's Clean Development Mechanism since 2011, and institutional arrangements to operationalise it as an international offset have been in place since 2012.

CCS is a technology that can deliver deep emissions reductions in many industrial processes that are vital to the global economy, such as LNG, steel, cement and chemicals production. CCS can also be applied to coal and gas fired power plants, providing dispatchable low emissions generation capacity to complement the increased deployment of intermittent renewables, and in the production of low emissions hydrogen for heat and transport.

> *"CCUS, is an important emissions reduction technology that can be applied across the energy system. CCUS technologies also provide the foundation for carbon removal or "negative emissions" when the CO2 comes from bio-based processes or directly from the atmosphere."* International Energy Agency

> *"A delay in the development of other CCUS technologies would have a major impact on the prospect of getting to net-zero emissions in 2050. For example, CCUS is the only scalable low-emissions option to remove CO2 from the atmosphere and to almost eliminate emissions from cement production. If progress in these technologies were delayed and could not be deployed at scale, then achieving net-zero emissions by 2050 would be vastly more difficult."* IEA Net Zero by 2050 Report, p.98

> *"Limiting the availability of CCUS would considerably increase the cost and complexity of the energy transition by increasing reliance on technologies that are currently more expensive and at earlier stages of development."* International Energy Agency, 2021

The Australian Government has recognised the critical role of CCS in a clean energy future, identifying CCS as one of the five priority low emissions technologies under its *Technology Investment Roadmap*.

The Australian industry is already investing and moving beyond the research and development phase with demonstration projects underway to deploy a broad range of these technologies as well as commercial scale CCS project at Gorgon Carbon Dioxide Reinjection Project in Western Australia. Other project scoping assessments are being undertaken around the country, including in the Cooper Basin and Gippsland Basin.

CCS is an important development for hydrocarbon-based economies, like Victoria's. It enables decarbonisation pathways of existing fuel stock, while also opening pathways for the development of new technologies and energy sources, like hydrogen. Identified as an important consideration as part of the Victorian Government's gas substitution roadmap, hydrogen can be produced through renewable electricity in electrolysis or from natural gas using a steam methane reforming (SMR), process combined with CCS. While these are different processes, they both produce clean hydrogen.

In Australia, the oil and gas industry has been at the leading edge of researching and deploying greenhouse gas storage technologies. The industry instigated significant research efforts into greenhouse gas storage in the late 1990s through the Australian Petroleum Cooperative Research Centre which undertook the first assessments of possible storage sites across Australia. Several years later that work was continued by CO2CRC Limited, which is based in Melbourne. The CO2CRC is recognised as one of the world's leading collaborative research organisations focused on carbon capture and storage and continues to receive significant backing from the Australian oil and gas industry. The CO2CRC's CCS project, the Otway International Test Centre, based in Victoria at Nirranda South, is a leading demonstration of the safe and secure geological storage of CO_2 and has served as a key case study of the application of CCS at an industry scale.[6]

While the oil and gas industry is moving ahead on scoping assessments and project development, APPEA believes that more can be done to support the uptake of CCS in Victoria. This can also be married together with developing a pathway to further develop a viable hydrogen industry to help meet its next zero 2050 target.

[6] See co2crc.com.au/who-we-are/about-us for more information. Globally there are already ten CCS projects in operation by the oil and gas sector. The Santos-led Moomba CCS project in South Australia is in its final phases of design and is expected to commence as early as next year – with a capacity to capture ~~all~~ 1.7Mt of CO_2 each year. The oil and gas industry also has the largescale engineering, pipeline, sub-surface and project management skills and capabilities to handle large volumes of CO_2 and to help scale up the deployment of CCUS. The industry is working with government towards the development of large-scale, commercial CCS hubs that will capture emissions not only from oil and gas, but from other industries such as power generation, steel, cement and chemicals.

What policies and/or regulations, if any, are needed to support the development of low carbon pathways such as biogas, green hydrogen, and carbon capture and storage?

APPEA supports measures to develop and accelerate low carbon pathways, in particular support for CCS. Indeed, Governments have a pivotal role to play, by providing a clear, stable and supportive policy framework for CCS. While the policy landscape has improved in recent years, there remain barriers and gaps that are holding back investment in CCS. The scaling up of deployment will only be achieved if there is a clear commercial case to invest in CCS.

In 2019, a group of industry associations (including APPEA) and others made a submission to the Federal Government on a CCS policy framework for Australia. That document is at Attachment 2.

The policy framework was proposed to facilitate greater investment in CCS projects. It was put forward acknowledging the pivotal role that can be played by the Australian Government in providing a clear, stable and supportive policy framework for CCS.

While the paper made recommendations tailored specifically for the Federal Government, we believe that there is scope for the development of state-leading policies to better support the uptake and deployment of CCS. The paper made four policy recommendations:

1. Tax Credits – The US Example: 45Q Tax Credit for Storage of Carbon Dioxide.
2. Australian Carbon Credit Units (ACCU's) and CC.S
3. The Clean Energy Finance Corp. Amendment (Carbon Capture and Storage) Bill 2017.
4. Hard to Reduce Risks

These four policy recommendations were framed around the principle of how best to put a value on reducing emissions so that the private sector can make rational choices to invest in long-lived (decades) capital-intensive CCS projects/assets (US$500 million to US$2+ billion).

The Paper noted that policies must provide for:

- Least cost reduction of greenhouse gas emissions and apply policy-parity with other low emission technologies;
- A long-term policy commitment on which to base long-term investments; and
- The continued international competitiveness of Australian industry, particularly its emissions-intensive, trade exposed sectors.

What else can you tell us about the implications of decarbonisation pathways for the electricity generation, transmission and distribution networks?

Efforts to reduce emissions should not be targeted at any one sector but rather focused on the core objective of reducing emissions across the economy. Such efforts should also be done in conjunction with national efforts to achieve emissions reductions across the entire economy. Such an approach would mean that government does not 'pick winners', and conversely that it does not make scapegoats of certain sectors.

This is especially critical in Victoria, given there are more than 2 million residential gas customers, nearly 65,000 commercial gas customers and more than 600 large industrial users of natural gas. Importantly, there is strong seasonal variability in the consumption of natural gas in the state. As the Australian Energy Market Operator identified in its Victorian Gas Planning Report, consumption of

gas in household, commercial and government settings peaks in winter. This is largely due to the demand for heating. Industrial customer demand tends to remain relatively stable throughout the year.[7]

As a lower emissions fuel, natural gas has an important role to play in helping Victoria reach its emissions reduction targets. Continuing to use natural gas for residential heating will deliver lower emissions by enabling renewables compared to the alternative of phasing out natural gas in preference for electrification that will have to be underpinned by brown coal for electricity generation.

To put this into perspective, Victoria generated 21 per cent of its 2018/19 electricity from renewable generation, or an equivalent of 4 per cent of its energy consumption including transport and gas energy. Power generation still includes brown coal resulting in the highest electricity emission intensity in Australia. While Victoria has legislated a 50 per cent renewable energy target by 2030, the definition in the Act indicates this applies only to electricity generation. If gas and transport energy consumption remain at current levels, the 50 per cent renewable target will cover just over 10 per cent of Victoria's energy use. Given the size and seasonal nature of this sector, it would appear unrealistic to electrify it as massive investments would be required to build new electricity infrastructure to meet the seasonal demands.

As Victoria seeks to decarbonise its economy, consideration should instead be given to the range of initiatives and pathways available to it. In support of this endeavour, the Australian gas industry has collectively developed *Gas Vision 2050*, a pathway document to help navigate the gas industry to 2050 and assess what role the industry can and will play in the Australian economy. It demonstrates how gas will continue to provide Australians with reliable and affordable energy beyond 2030.

The report outlines a roadmap to decarbonising the natural gas sector to help meet Australia's emissions reduction commitments over the coming decade and documents innovative research and strong progress being made in advancing transformational technologies. It is at Attachment 3.

To support the development of *Gas Vision 2050*, Frontier Economics completed a study to investigate and evaluate options of the roles of gas and gas infrastructure to achieve a net zero economy by 2050. The study focused on ongoing capital and operating costs in 2050 assuming a transition to a decarbonised economy was made by then. The annual costs of different decarbonisation scenarios were modelled. These scenarios were compared to a base case where the electricity sector reached net zero emissions in 2050 while unabated gas use continued to supply heat and feedstock to industry. These scenarios achieved net-zero emission from gas use and included blue hydrogen, green hydrogen and electrification – all matters under active consideration by the Victorian Government's Gas Substitution Roadmap discussion paper. A copy of the Frontier Economics report is at Attachment 4.

The modelling found that the Zero-Carbon Fuels scenario (that utilises natural gas as a fuel source for hydrogen developments combined with CCS) was found to be the lowest cost, compared to both an Electrification scenario and a Renewable Fuels scenario. The cost saving for the Zero-Carbon Fuels scenario relative to the Renewable Fuels scenario is a result of the lower cost of the gas used by the Steam Methane Reforming process (SMR) than electricity used in the electrolyser. The fact that the gas delivered to the SMR can make use of existing gas transmission assets whereas the delivery of hydrogen from the electrolyser will require new investment in hydrogen transmission pipelines, also accounts for some of the cost saving. Against this, the SMR requires additional cost to capture and

[7] AEMO, *Victorian Gas Planning Report, 2021*.

store carbon, but this additional cost does not outweigh the savings from using gas rather than electricity.

The modelling finds that there is value in continuing to make use of Australia's natural gas resources to deliver gaseous fuels to end-use customers. It also finds that making continued use of existing assets to deliver energy, such as the existing gas transmission and distribution network can help avoid the material costs of investing in new assets to deliver energy.

Policies to achieve net zero emissions should be broad-based and should not focus solely on promoting a particular pathway against other viable alternatives. There is significant uncertainty about technological developments and costs over the period to 2050, and effectively ruling out the continued application and use of natural gas with mitigating technologies is short-sighted. A broad-based policy objective to achieve net zero that follows an objective rather than a prescriptive pathway will encourage participants and customers to respond flexibly with technology and at lowest cost.

Yours sincerely

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