appea the voice of australia's oil and gas industry

Submission

May 2019

Liquid Fuel Security Review, Interim Report, April 2019

CONTENTS

Executive Summary/Key Recommendations

- APPEA welcomes the opportunity to provide comment on the Department of the Environment and Energy's (the Department) *Liquid Fuel Security Review, Interim Report, April 2019* (the Interim Report).
- APPEA has supported the Liquid Fuel Security Review (the Review) and its importance in providing an in-depth examination of the liquid fuels market and the resilience of liquid fuel supply under a range of scenarios.
- Reliable, secure and competitively priced energy is crucial to our everyday lives in Australia. Oil and gas plays a key role in meeting many of our energy needs. In 2016-17, oil was the largest primary energy source in Australia providing nearly 38 per cent of all energy consumed. Natural gas provided almost 25 per cent of primary energy.
- APPEA notes the Department is developing a model of the fuel market and its supply chains, to track liquid fuel supply from oil wells, both overseas and in Australia, through to fuel stations around the country.
    - This is a useful development and one that APPEA supports. APPEA encourages the Department to consult with industry as this model is developed and make it available to all stakeholders to use to test various scenarios and policy options.
- The Australian economy will be reliant on liquid fuel for many years to come. While Australia benefits directly from the operation of a very deep and liquid global supply chain and a diversity of supply forms and sources it remains the case that ongoing investment in the exploration for and development of Australia's oil and gas reserves and resources is an important element of Australia's ongoing liquid fuel security.
    - Successful oil exploration and development may support domestic liquid fuel security directly if that development (or some of that development) is used to supply Australian refineries, or indirectly, if it adds to the flow of liquids into refineries in the Asia-Pacific region, many of which supply the Australian market. In both cases, Australia's liquid fuel security benefits from this development.
    - This is over and above the direct and indirect economic benefits further development of Australia's oil (and gas) resources can bring to local, State and national economies.
- Australia's liquid fuel security benefits from our participation in the global market for liquid fuels. Our participation provides a diversity of supply sources and a variety of supply chains. This global engagement has served Australia well for many decades and can be expected to continue to be an important element of Australia's liquid fuel security in the years ahead.
- Any move to mandate fuel stockholding, either through Government or industry stockholding, would incur significant capital cost and significant ongoing capital and operational costs. These costs will find their way into higher fuel costs for all Australian consumers, and so should be approached with extreme caution.
- In addition to its role as a producer of liquids for domestic and export markets, the Australian oil and gas industry is itself a source of demand. Liquid fuels are used in exploration and production facilities, in the industry transport task and as a source of power generation in some remote area applications.
    - This means a secure liquid fuels market is important to the oil and gas industry as both a consumer and producer of liquid fuels, providing the industry with a unique perspective on many of the issues considered in the Interim Report.
- Like most other commodities, the price in relevant international markets is a key influence of the Australia prices for liquid fuels. As the report notes, Australian liquid fuel demands is, for a range of reasons, relatively inelastic.

    - It has been the case for many years however, that while price movements do not result in significant changes in demand, concerns are expressed in other ways, often through political pressure. This means any recommendations flowing from the Review will need to be mindful of the effects of any changes in costs facing Australian consumers, including industry.
- While it is the case that allowing the liquid fuel market(s) to operate relatively freely has led to relatively low prices by international standards, it is still the case that the downstream market is the subject of relatively frequent scrutiny and oversight by the ACCC.
    - This means moves to consider or implement further transparency and oversight measures should be preceded by a rigorous cost-benefit analysis to ensure any reforms will provide improved outcomes for Australian consumers and encourage efficient and timely investment by Australian industry, including exploration and production in the upstream oil and gas industry.
- Disruptions to liquid fuel supply are generally managed through the industry and liquid fuels market, with little need for government intervention. This should continue to be the case, with government intervention only considered where the market has demonstrably failed and intervention would improve outcomes.
    - Market mechanisms have proven effective and relatively low cost in managing all but the most severe liquid fuel energy security challenges.
    - In the case of more severe challenges, many of which have not been faced, at least in practical terms, in Australia, the government and industry possess a range of legislative, regulatory and market tools that can be called on.
- The Interim Report notes that work conducted to date suggests that the options available to government under the *Liquid Fuel Emergency Act 1984* (LFE Act), which have never been used, are likely to be impeded by burdensome administrative requirements.
    - This means a review of the Act may be timely. It remains the case that the Act bestows significant powers on the Government to intervene in the event of a liquid fuel emergency and to direct the flow of liquid fuels to key users.
- Comparisons to other countries should be approached with some caution. While Australia has chosen to take a particular approach to managing its liquid fuel security interest that may differ in some respects to the approaches of other countries, this approach has served Australia well and managed both liquid fuel security issues and cost competitiveness.
- The emergence of a number of other potential liquid fuel sources, including from natural gas and from hydrogen, represent new market opportunities and provide new forms of liquid fuel supply that can add to Australia's liquid fuel security, supplementing traditional supply sources and diversifying Australia's liquid fuel supply chains.
- APPEA notes the Australian Government has in place a plan to return Australian to compliance with its obligations as a signatory to the IEA agreement on an international energy program (IEP) treaty by 2026. The Australian upstream oil and gas industry has so far played a constructive role in the implementation of this plan and this will continue.
- APPEA encourages the Australian Government to continue its engagement with the IEA to consider reforms to various aspects of the IEA's stock definition to ensure it is modernised to better reflect globalised trade and markets.
- In addition, any fuel security policy responses must be mindful of Australia's commitments to meeting its emissions reduction obligations (and any future emissions reduction obligations) under the Paris Agreement.
- APPEA would welcome the opportunity to meet with the Department to discuss any of the issues raised in this submission and looks forward to its ongoing involvement in the Review.

Introduction

Since 1959, the Australian Petroleum Production & Exploration Association (APPEA) has been the peak national body representing the upstream oil and gas exploration and production industry. APPEA has around 60 member companies that explore for and produce Australia's oil and gas. In addition, APPEA's more than 130 associate member companies provide a wide range of goods and services to the industry. Further information about APPEA can be found on our website, at www.appea.com.au.

APPEA welcomes the opportunity to provide comment on the Department of the Environment and Energy's (the Department) *Liquid Fuel Security Review, Interim Report, April 2019* (the Interim Report), released on 4 April 2019.

In addition to the APPEA submission, a number of APPEA members have made individual submissions to the Interim Report. This response should be read in conjunction with submissions from individual APPEA members.

APPEA's submission addresses specific aspects of the Interim Report, focussing on those areas that are relevant to the upstream oil and gas industry. APPEA understands that downstream issues will be considered in the submission from the Australian Institute of Petroleum (AIP).

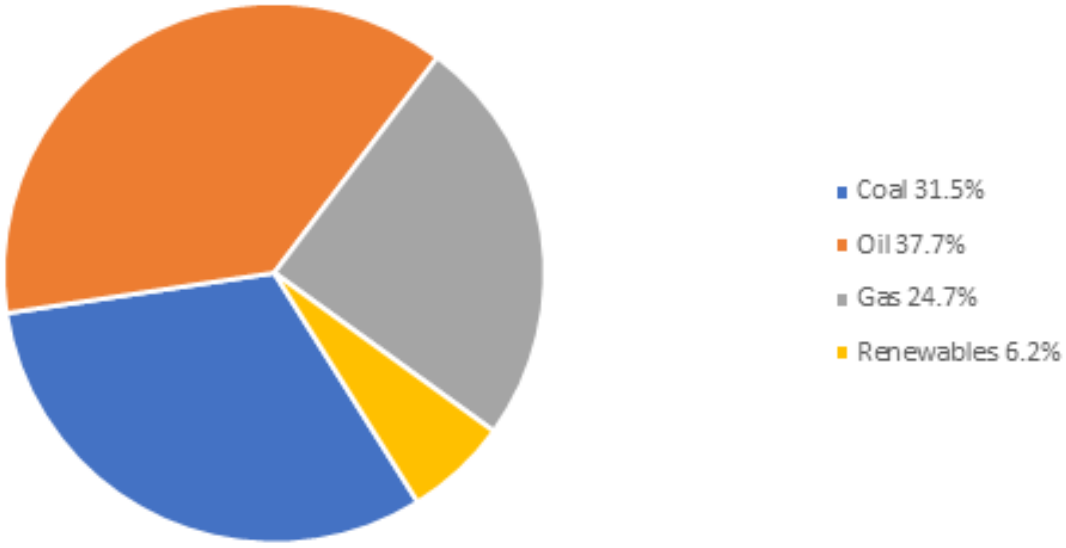
Liquid Fuel Security Review, Interim Report: general comments

Since it was announced in May 2018, APPEA has supported the Liquid Fuel Security Review (the Review) and its importance in providing an in-depth examination of the liquid fuels market and the resilience of liquid fuel supply under a range of scenarios.

Reliable, secure and competitively priced energy is crucial to our everyday lives in Australia. Oil and gas plays a key role in meeting many of our energy needs.

In 2016-17, oil was the largest primary energy source in Australia providing nearly 38 per cent of all energy consumed. Natural gas provided almost 25 per cent of primary energy. Renewables accounted for just over 6 per cent of Australia's primary energy consumption in 2016-17.

Share of primary energy consumption 2016-17



Source: Australian Energy Update 2018

A model of the liquid fuel market

APPEA notes the Interim Report states on page 1 that the Department is developing a model of the fuel market and its supply chains, to track liquid fuel supply from oil wells, both overseas and in Australia, through to fuel stations around the country.

This is a useful development and one that APPEA supports. A clearer understanding of the market, its interconnectedness and relationships with other parts of the economy will provide an important information base to better inform policy development. APPEA encourages the Department to consult with industry as this model is developed and make it available to all stakeholders to use to test various scenarios and various policy options.

The importance of a market-based approach to liquid fuel security

The interim Report asserts on page 2 that successive Australian governments have chosen to apply minimal regulation or government intervention in pursuit of an efficient market that delivers fuel to Australians as cheaply as possible.

While it is the case that allowing the liquid fuel market(s) to operate relatively freely has led to relatively low prices by international standards, it is still the case that the downstream market is the subject of relatively frequent scrutiny and oversight by the Australian Competition and Consumer Commission (ACCC).

As will be considered further below, this means any moves to consider or implement further transparency and oversight measures should be preceded by a rigorous cost-benefit analysis to ensure any reforms will provide improved outcomes for Australian consumers and encourage efficient and timely investment by Australian industry, including exploration and production in the upstream oil and gas industry.

Liquid Fuel Security Review: comments on specific sections of the Interim Report

The sections below offer some comments on sections of the Interim Report. APPEA would welcome the opportunity to meet with the Department to discuss these comments.

The importance of liquid fuels

APPEA agrees, as the paper notes on page 3, that the Australian economy will be reliant on liquid fuel for many years to come. While Australia benefits directly from the operation of a very deep and liquid global supply chain and a diversity of supply forms and sources – as the Interim Report notes, in 2017-18, Australia sources crude oil from 40 countries and refined product from 66 countries – it remains the case that ongoing investment in the exploration for and development of Australia's oil and gas reserves and resources is an important element of Australia's ongoing liquid fuel security.

Successful oil exploration and development may support domestic liquid fuel security directly if that development (or some of that development) is used to supply Australian refineries, or indirectly, if it adds to the flow of liquids into refineries in the Asia-Pacific region, many of which supply the Australian market. In both cases, Australia's liquid fuel security benefits from this development.

As the Interim Report notes on page 8, liquid fuel is the backbone of the Australia economy. Domestic production of liquid fuel is an important element of Australia's overall liquid fuel supply. As the figure on page 9 of the Interim Report notes, Australia's domestic production of naturally occurring liquid petroleum gas (LPG), crude oil and condensate totalled 685 petajoules (PJ) in 2016-17, with biofuel production (7.1 PJ) and crude oil and condensate imports a further 788 PJ.

This means that local production, which supplies around 30 per cent of total domestic consumption (highlighted in the figure on page 9 of the Interim Report at 2,247 PJ) remains an important element of Australia's overall liquid fuel supply. It also means that increased local production, considered further in the case study on possible developments in the Great Australian Bight, outlined in Box 1 below, can have direct and indirect benefits for Australia's liquid fuel security, over and above the direct and indirect economic benefits further development of Australia's oil (and gas) resources can bring to local, State and national economies.

Box 1. Case Study: ACIL Allen report *Petroleum Development in the Great Australian Bight, a Preliminary View of the Economic Impact of Development*

In 2018, APPEA commissioned independent economic consultants ACIL Allen to undertake a preliminary assessment of the economic potential of successful petroleum exploration and production in the Great Australian Bight.

That report[1], *Petroleum Development in the Great Australian Bight, a Preliminary View of the Economic Impact of Development*, found successful oil exploration in the Great Australian Bight could see the creation of more than 2,000 jobs in South Australia and generate over $7 billion in average annual tax revenue to Federal and State governments over the next four decades. The indirect benefits of the activity and the associated tax revenue could see almost 5,000 jobs created across Australia in the period between 2020 and 2060.

The study examines two possible production scenarios from the exploration permit areas granted by the Australian Government: a "base" case production scenario of 1.9 billion barrels of oil equivalent liquids, as was estimated by Wood McKenzie in 2015, and a "high" case production scenario of 6 billion barrels, a resource potentially equivalent to Bass Strait.

The base case development could see the creation of 1,361 jobs in South Australia during the development and construction phase, and an average 826 jobs per year over the next 40 years.

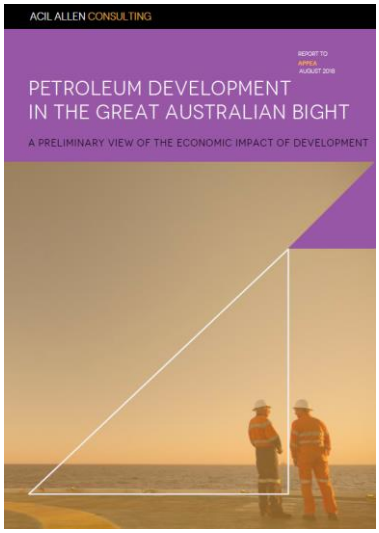
In the event that resources in the Bight did prove comparable to Bass Strait, that number would rise to 2,116 SA jobs during construction and an average 1,521 jobs per year over the next 40 years.

The economic stimulus provided by development in the Bight, could see the creation of an additional 821 jobs nationwide over the life of the projects in the base case, rising to 3,442 jobs in the high case.

[1] See www.appea.com.au/wp-content/uploads/2018/08/Economic-Impact-of-Petroleum-Development-in-the-Great-Australian-Bight-report.pdf for a copy of the full report and www.appea.com.au/wp-content/uploads/2018/08/Economic-Impact-of-Petroleum-Development-in-the-Great-Australian-Bight-Fact-Sheet.pdf for a copy of a Fact Sheet highlighting the report's economic modelling approach and key findings.

While still in its very early stages, successful petroleum exploration and development in the Bight could bring a new investment in South Australia, delivering jobs, economic opportunities and regional development for decades to come. The study found the benefits of this activity would also be widely spread, including in key regional centres such as Port Lincoln and Ceduna, where onshore facilities and services were likely to be based.

It remains the case, of course, that at this early stage it is not possible to know the extent to which any successful development on the Bight would be used to supply domestic refineries, it is also the case that a significant find could add to Australia's overall energy security and provide ongoing economic benefits.



Energy security and liquid fuels

As the Interim Report notes on page 10, Australia benefits from its participation in global energy markets. For example, Australia is expected[2] to export in 2018-19 over 75 megatonnes (Mt) of liquefied natural gas (LNG) valued at around $50.2 billion. These exports, which follow nearly $350 billion investment by the industry over the last ten years or so, will deliver decades of economic growth, jobs and export revenue and have a range of regional and global environmental benefits.

Australia's liquid fuel security similarly benefits from our participation in the global market for liquid fuels. Our participation provides a diversity of supply sources and a variety of supply chains. This global engagement has served Australia well for many decades and can be expected to continue to be an important element of Australia's liquid fuel security in the years ahead.

With that in mind, APPEA agrees with the approach outlined on page 11, which notes:

> *Reliability of supply needs to be carefully defined. Guaranteed uninterrupted supply of liquid fuels may come at a high cost or it may be unattainable if we are still to deliver affordable fuel. This needs to be balanced with what is a reasonable price for people and businesses to pay for fuel. 'Liquid fuel security' results in a trade-off between reliability and price. This review pays careful attention to ensuring that security measures do not outweigh the importance of delivering affordable fuel to Australians.*

Very importantly, and as is noted in various parts of the Interim Report, any move to mandate fuel stockholding, either through Government or industry stockholding, would incur significant capital cost and significant ongoing capital and operational costs. These costs will find their way into higher fuel costs for all Australian consumers, and so should be approached with extreme caution:

- Investment in storage and stock-holdings increases working capital, increasing unit fuel cost.

[2] See publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2019/index.html for more information.

- Large consumers assess and manage their own fuel supply chain risks to a level of tolerance with which they are comfortable.
- While the broad outlook is for future growth, it is also that case that increases in alternative fuels (such as LNG and hydrogen) and electrification has the potential to reduce total consumption of petroleum fuels (or its growth rate) and therefore reduce the potential risks associated with existing supply fuel chains.

Australia's Liquid Fuel Market: Demand and Supply

Demand

In addition to its role as a producer of liquids for domestic and export markets, the Australian oil and gas industry is itself a source of demand. Liquid fuels are used in exploration and production facilities, in the industry transport task (machinery and equipment and heavy and light vehicle use) and as a source of (particularly diesel for back-up) power generation in some remote area applications.

While hard-rock mining is the dominant source of demand, liquid fuel consumption in the oil and gas industry forms part of the 22.4 PJ of demand categorised to the mining sector in the figure on page 8 of the Interim Report.

In the case of eligible liquid fuels, the industry in 2017-18 accounted for around 1.6 per cent of total fuel tax credit claims (for liquid fuel consumption of an estimated 263 million litres) in Australia or around 3.6 per cent of total 'mining' claims[3].

This means a secure liquid fuels market is important to the oil and gas industry as both a consumer and producer of liquid fuels, providing the industry with a unique perspective on many of the issues considered in the Interim Report.

Supply

As noted above, while Australian oil production meets a relatively modest proportion of final liquid fuel demand, it remains an important element of Australia's liquid fuel security. Increases in future production, particularly if the result of major exploration success, could see this picture change.

It is also the case, as the Interim Report notes on page 20, that local production could become particularly important should there be a severe disruption to Australia's liquid fuel imports. On this basis, Australia's domestic production provides important economic benefits and an energy security buffer.

While exploration in some areas, such as the Great Australian Bight (considered in detail above) and the Beetaloo Basin, is at a preliminary stage, and it is too early to judge the extent to which

[3] Eligible liquefied fuels are petrol, diesel and other fuels, such as kerosene, mineral turpentine, white spirit, toluene heating oil and some solvents. See www.ato.gov.au/Business/Fuel-schemes/Fuel-tax-credits---business/Eligibility/Eligible-fuels/?anchor=LiquidFuels1#LiquidFuels1 for more information.

such exploration will be successful, or to extent to which any exploration success will lead to production, and the extent to which that production could service domestic or export markets, ensuring Australia is an attractive and welcoming destination for oil and gas industry investment remains vital.

In the case of the 2018 Dorado oil discovery[4] in the highly prospective Bedout Basin offshore from Western Australia, production from that field, when developed, will add to Australia's liquids production. Depending on demand from local refineries, crude oil produced from Dorado could be processed in Australia, adding directly to Australia's internally generated liquid fuel supplies.

This means that there is some cause to be more optimistic about the timeframes for development that is suggested on page 26 of the Interim Report, which appears to suggest new developments are unlikely to come into production until after 2030.

In addition, and as the Interim Report notes on page 24, Australia has established a long-standing energy export related trading relationships in the Asia-Pacific and beyond and has, in the case of LNG, for example, established itself over many decades as a reliable and competitive source of supply.

These relationships also serve us well in areas where we are a significant importer, such as in liquid fuels. Australian also has a strong track record in negotiating broader market access and supply agreements, including our various free trade agreements with major trading partners. Actions that adversely affect that reputation (for example, intervening in export markets) will also have adverse implications for our trading relationships with Australia's sources of liquid fuel imports, which may in some cases be our customers for other energy commodities.

Establishing and maintaining secure and cooperative relationships with our major trading partners, and resisting market interventions that will damage those relationships, will provide an important underpinning to the trade relationships that underpin this aspect of Australia's liquid fuel security arrangements.

Pricing: affordable fuel for Australians

APPEA agrees with the statement of page 34 of the Interim Report that

> *Fuel should be competitively priced and accessible to all Australians. Measures to increase fuel security cost money, but these costs should be balanced against the benefits of making sure that fuel remains an affordable energy source for Australians. While it is important that a level of insurance is built into the supply chain to limit the impact of disruptions, the cost of this insurance should not be more than the economic impact of the disruptions themselves.*

This means each of the recommendations made as part of the Review should be subject to a transparent cost-benefit analysis, informed by consultation with industry.

[4] See www.carnarvon.com.au/wp-content/uploads/2018/07/Dorado-1-oil-discovery.pdf and www.carnarvon.com.au/wp-content/uploads/2018/08/1828743.pdf for more information.

Pricing fuel in Australian based on the global market

Like most other commodities, the price in relevant international markets is a key influence of the Australia prices for liquid fuels. As the report notes, Australian liquid fuel demands is, for a range of reasons, relatively inelastic.

It has been the case for many years however, that while price movements do not result in significant changes in demand, concerns are expressed in other ways, often through political pressure, and this means any recommendations flowing from the Review will need to be mindful of the effects of any changes in costs facing Australian consumers, including industry.

The Interim Report on page 37 references International Energy Agency (IEA) analysis from 2018 that points to the possibility of higher oil prices in future years as demand exceeds supply. It will be important in the final report to ensure any analysis of the global market and implications for the global oil prices, and liquid fuel prices in Australia, is based on the latest available information. For example, the most recent *Resources and Energy Quarterly: March 2019*, prepared by the Department of Industry, Innovation and Science[5] presents a somewhat different outlook, noting

> *In 2019, oil prices are expected to average US$69 a barrel, as OPEC and Russian production declines. Over the medium term, strong growth in US shale oil supply is likely to drive prices lower.*

While APPEA does not have a view on the price outlook for the global oil market, it does recommend any analysis be made on the basis of the most recently available information.

Market oversight in Australia

APPEA notes that ACCC monitoring, while subject to government direction, appears ongoing and extensive, with reports made regularly available to the Australian public.

Any extension to such monitoring and other information (such as that provided in the United States by the Energy Information Administration[6], a very large government organisation with significant resources) would need to be made on the basis of a rigorous cost-benefit analysis that clearly demonstrated that any additional monitoring/transparency would improve outcomes for consumers, including industry.

There are also a range of private sector information providers that make a significant level of regularly updated and, in some cases, real-time price and other information to the market[7].

Global market risks and mitigation

APPEA agrees with the statement of page 42 of the Interim Report that *"… there are still good reasons to have confidence in the global oil market."* As noted above, Australia's engagement in global and regional energy markets, including for oil and other liquid fuels, has served us well in the past and will continue to serve us well in the future.

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[5] See publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2019/documents/Resources-and-Energy-Quarterly-March-2019.pdf for more information.
[6] See www.eia.gov/about for more information.
[7] For example, AIP provides a range of information about liquid fuel prices in Australia on a regular basis. This information is available at aip.com.au/pricing. In addition, a number of apps are readily available to provide essentially real-time price information.

Looking ahead, and as the Interim Report notes, there are a range of mutual interests between exporters and importers that *"… create incentives to reduce the threat of major, disruptive incidents and promote a functioning oil market."*

Notwithstanding this, and as noted above, APPEA supports the use of scenario planning and other tools and exercises to test the resilience of Australia's liquid fuel supply chain. APPEA has participated in a number of the exercises and consultations as part of this Review and will look forward to our continued engagement as the Review progresses, for example, in any assessment of the appropriateness of the legislative framework for responding to liquid fuel security changes and in future processes related to assessments of Australia's liquid fuels security.

Managing the response to disruptions

As the Interim Report notes on page 5, and in more detail on pages 45-51,disruptions to liquid fuel supply are generally managed through the industry and liquid fuels market, with little need for government intervention. This should continue to be the case, with government intervention only considered where the market has demonstrably failed and intervention would improve outcomes.

That said, and as noted above, using the Department's proposed market model to test more significant disruptions and more extreme scenarios may provide valuable insights to inform policy developments.

As the Interim Report notes on page 45, market mechanisms (that is, demand/supply relationships and how these are reflected in price and how demand and supply reacts to price signals) have proven effective and relatively low cost in managing all but the most severe liquid fuel energy security challenges. In the case of more severe challenges, many of which have not been faced, at least in practical terms, in Australia, the government and industry possess a range of legislative, regulatory and market tools that can be called on.

Review of the *Liquid Fuel Security Act 1984*

The Interim Reports notes on page 5 that work conducted to date suggests that the options available to government under the *Liquid Fuel Emergency Act 1984* (LFE Act), which have never been used, are likely to be impeded by burdensome administrative requirements.

APPEA notes the LFE Act has been reviewed a number of times since 1984, but a further review, in the context of the findings of this Liquid Fuel Security Review, may be timely. As has been the case in the past, APPEA would welcome the opportunity to be involved in any future review of the LFE Act.

While a review of the LFE Act may be timely, it remains the case that the Act bestows significant powers on the Government to intervene in the event of a liquid fuel emergency and to direct the flow of liquid fuels to key users. As the Interim Report notes on page 50, these powers are extensive and would represent an extreme response (and one that has not been used in the 35 years the LFE Act has been in place).

State or Territory government involvement

APPEA supports the work underway, noted on page 49 of the Interim Report, to provide in the Final Report, a *"… more detailed analysis of state and territory legislative arrangements."*

This analysis will be important to better understand the interactions between state/territory and national legislative frameworks and associated regulatory/administrative arrangements to understand, to the extent reforms or updates to these arrangements are required, where responsibility for these changes rests, that is, with the Australian Government or with relevant state/territory governments.

How does Australia compare?

Comparisons to other countries should be approached with some caution. While Australia has chosen to take a particular approach to managing its liquid fuel security interest that may differ in some respects to the approaches of other countries, this approach has served Australia well and managed both liquid fuel security issues and cost competitiveness for Australian consumers.

Future outlook

While APPEA does not prepare its own outlooks for liquid fuels, relying instead on forecasts, projections and scenarios from international agencies, such as the IEA, or the Department of Industry, Innovation and Science, APPEA does agree with the broad trends set out on page 53 of the Interim Report, that growth in liquid fuels demand is likely until at least the 2030s, with the absolute level of demand for liquid fuels higher in 2040 than it is today.

This reinforces the need, highlighted in early sections, for Australia to be an attractive destination for oil and gas investment, both for oil exploration and production and for the development of alternative fuel sources, such as LNG and hydrogen.

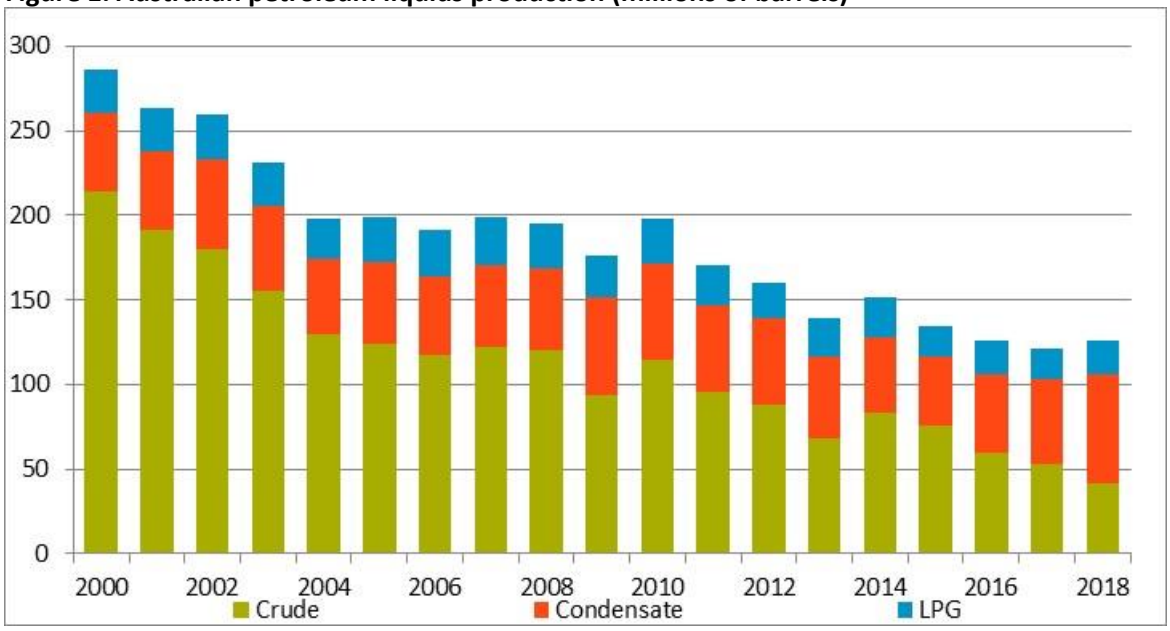
The emergence of a number of other potential liquid fuel sources

The emergence of a number of other potential liquid fuel sources, including from natural gas and from hydrogen, represent new market opportunities and provide new forms of liquid fuel supply that can add to Australia's liquid fuel security, supplementing traditional supply sources and diversifying Australia's liquid fuel supply chains.

The Interim Report notes on page 4 that while Australia is an energy superpower, that is not the case when it comes to oil.

Australia's liquid fuel production peaked in 2000 at 287 million barrels and has declined every year since then until 2017. In 2018 however, Australia's liquid fuel production increased by 3.8 per cent compared with 2017, to total 126 million barrels. This was primarily due to increased condensate production from the Ichthys project. Further increases in production from Ichthys and from the Prelude FLNG facility are possible in coming years.

Figure 1. Australian petroleum liquids production (millions of barrels)



Source: APPEA Production Statistics (until 2013), EnergyQuest (2014 onwards)

Beyond that, successful exploration (and ultimately development) efforts may add (in some scenarios, significantly) to Australia's future liquid fuels production. These possibilities are considered further below.

In addition, and as the Interim Report notes on page 4, Australia can play an important role in the development of a hydrogen industry, both for domestic use and in developing an export industry. A national hydrogen strategy is a key first step to developing a valuable new industry for the nation.

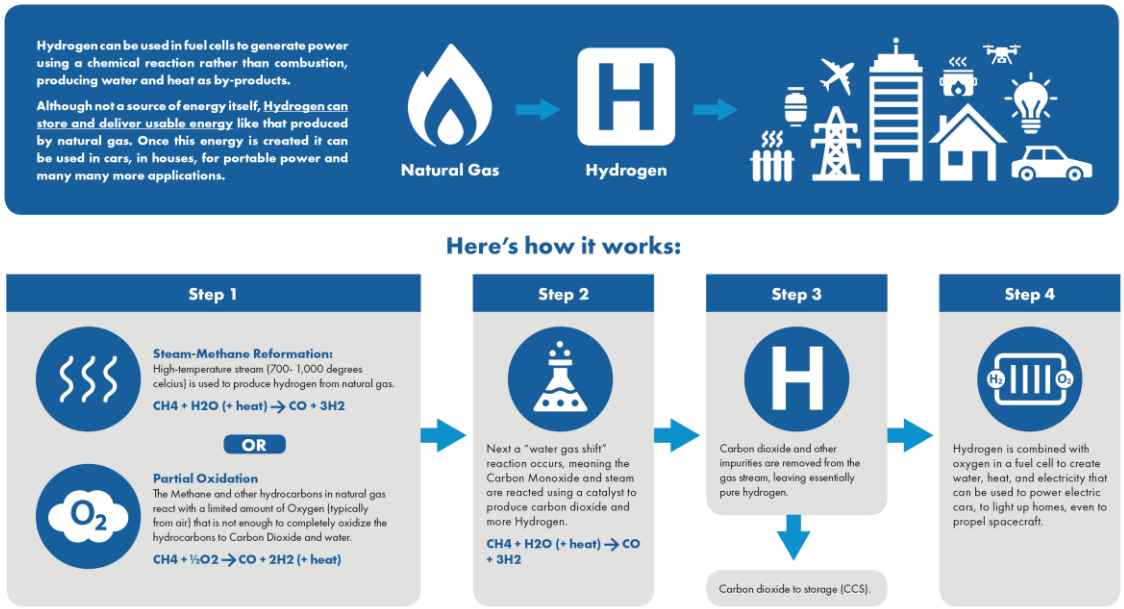
There is tremendous interest globally in hydrogen as a new, cleaner fuel and Australia is well placed to capitalise on our capabilities. Australia has, for example, the opportunity to export liquefied hydrogen alongside LNG to meet the growing demand for cleaner energy across the Asia-Pacific. Australia's LNG industry is ideally placed to support the growth of a new hydrogen export industry in Australia. Australia's LNG export success story means our industry has the technology, the expertise and the commercial and trade relationships to make hydrogen exports a reality.

Hydrogen is already being produced from Australian LNG exports. In the United States, natural gas is the dominant source of their growing hydrogen industry.

Natural gas can provide a fuel source for hydrogen made through the process of steam methane reforming (SMR), with any greenhouse gas emissions generated during SMR managed through market offset or technical abatement to offer a carbon-neutral product. A number of APPEA members are already exploring those opportunities[8].

[8] See www.appea.com.au/media_release/gas-industry-to-play-key-role-in-hydrogen-future and www.appea.com.au/media_release/natural-gas-can-power-hydrogen-future for more.

Figure 2. Natural gas and Hydrogen



Source: Energy Information Australia (2019) (see www.energyinformationaustralia.com.au/natural-gas-to-hydrogen-conversion for more).

Strong partnerships across government, industry and the research community are essential if Australia is to make the most of the opportunity arising from this emerging technology.

As has been the case with Australia's LNG export industry, a growing hydrogen export industry can support a strong and growing domestic industry that could supplement Australia's traditional liquid fuel supplies and add to Australia's liquid fuels security.

There are also opportunities to expand the use of LNG fuels, in Western Australia for example, where large LNG production facilities operate close to fuel-intensive mining developments. Around 3 billion litres of diesel are imported into the Pilbara every year, primarily for mining. The ships moving mining exports to market use around 5 billion litres of heavy fuel oil.

LNG can replace these higher-emissions fuels, reducing greenhouse gas emissions by up to 30 per cent on a lifecycle basis, while virtually eliminating emissions of sulphur dioxide and fine particulate matter, and dramatically reducing emissions of nitrous oxide.

The global momentum towards LNG as a marine fuel is driven in part by the introduction from January 2020 of the International Maritime Organisation's 0.5 per cent sulphur cap on shipping fuels. The organisation has also committed to halving greenhouse gas emissions from shipping by 2050.

The global fleet of LNG-fuelled ships is growing rapidly. This includes 27 large cruise ships, with the first having started operations in 2018. In Australia, in 2017, Woodside launched the *Siem Thiima*, the first LNG-fuelled marine support vessel in the southern hemisphere.

The industry is also exploring the use of LNG to generate power in remote areas of Western Australia and to fuel heavy transport. This has the potential to improve Australia's fuel security and reduce reliance on imports.

APPEA member company Woodside, for example, is preparing an LNG fuels hub to capture the environmental and commercial benefits[9]. Woodside has built a facility at its Pluto LNG plant to supply trucked LNG for remote power generation, displacing diesel, and for mining equipment, including trucks and trains. The second phase of the LNG fuels hub will be a bunker ship, to take LNG from Pluto and provide it to ocean-going vessels, such as iron-ore carriers.

The oil and gas industry maintains a strong preference for an approach that emphasises the operation of the market to manage Australia's liquid fuel security requirements. Such an approach should encourage a diversity of suppliers, supply sources and supply chains to ensure Australia enjoys a high level of liquid fuel security while ensuring costs to consumers, including industry, remain competitive.

As part of this, policies to ensure the Australian oil and gas industry can continue to explore for, and if discoveries are made, develop Australia's oil (and gas) resources are important. Australia needs to be an attractive investment destination for oil and gas investment in what is an increasingly competitive global marketplace.

In addition, strong partnerships across government, industry and the research community are essential if Australia is to make the most of the opportunity arising from alternative liquid fuel sources, such as natural gas and hydrogen.

International commitments

As noted in various places in the Interim Report, the Australian Government has in place a plan to return Australian to compliance with its obligations as a signatory to the IEA agreement on an international energy program (IEP) treaty by 2026. The Australian upstream oil and gas industry has so far played a constructive role in the implementation of this plan and this will continue.

APPEA participated in the recent (2016 and 2017) consultation process around the development of mandatory reporting of petroleum statistics arrangements, that led to the introduction of the *Petroleum and Other Fuels Reporting Act 2017* and the *Petroleum and Other Fuels Reporting Rules 2017*.

APPEA encourages the Government to ensure its mandatory reporting arrangements are efficient and effective, underpinned by low cost administrative systems to support mandatory reporting, that education and other outreach activities for reporters remains a key focus. The Department must continue to ensure that it has appropriately skilled resources available to support the new regime and that the Department continues to explore, and implement, data sharing opportunities with other stakeholders.

APPEA has also supported and promoted the ticketing arrangements that have been announced with a range of countries and encourages the Australian Government to continue to explore these opportunities.

As noted above, the move to mandatory reporting has only just been completed, with reporting under the new regime first published in April 2018. The operation of the new reporting regime should be considered and assessed before moves to more frequent reporting arrangements are considered.

[9] See files.woodside/docs/default-source/media-releases/woodside-driving-development-of-domestic-lng-market.pdf?sfvrsn=206a7971_2 for more information.

APPEA encourages the Australian Government to continue its engagement with the IEA to consider reforms to various aspects of the IEA's stock definition to ensure it is modernised to better reflect globalised trade and markets, particularly compared to the markets existing in the 1979 when Australian become a signatory to the IEP treaty.

Fuel supply chains, including for liquid fuels, have become globalised with a diverse range of procurement options now available across the supply chain. For example, companies operating in Australia may have contractual rights to fuel stocks stored in other countries.

In addition, and as noted on page 2 of the Interim Report, inclusion of stock on water (tankers destined for Australian terminals) would result in around 80 days of total stock, with the Interim Report noting on page 2

> *Australia has up to 80 days (average for 2018) of net imports if we count fuel on the way to Australia. This includes fuel already loaded in ports of other IEA countries or in tanker ships on the ocean. While these stocks are not allowed to be counted under current IEA methodology, these stocks are owned by Australian companies and are destined for import to Australia.*

These stocks should be better recognised in IEA stockholding measurements and Treaty obligations.

In addition, any fuel security policy responses must be mindful of Australia's commitments to meeting its emissions reduction obligations (and any future emissions reduction obligations) under the Paris Agreement[10].

Conclusion and next steps

APPEA would welcome the opportunity to meet with the Department to discuss any of the issues raised in this submission and looks forward to its ongoing involvement in the Review.

[10] See APPEA's *Climate Change Policy Principles*, available at www.appea.com.au/wp-content/uploads/2016/02/Climate-Change-Policy-Principles-APPEA-final.pdf, for more information.