



Updating the Authority's Previous Advice on Meeting the Paris Agreement: Consultation Paper, July 2019

CONTENTS

INTRODUCTION	2
THE AUSTRALIAN UPSTREAM OIL AND GAS INDUSTRY	2
THE KEY ROLE NATURAL GAS PLAYS IN REDUCING GLOBAL GREENHOUSE GAS EMISSIONS	4
NATURAL GAS: INTEGRAL TO A LOW CARBON AUSTRALIAN ECONOMY.....	4
NATURAL GAS: INTEGRAL TO LOW CARBON ECONOMIES IN ASIA.....	6
COMMENTS ON SPECIFIC ISSUES RELEVANT TO THE CONSULTATION PAPER	10
PRINCIPLES FOR ASSESSING POLICIES	10
PREVIOUS RECOMMENDATIONS	12
KEY AREAS OF INVESTIGATION	13
FINDING THE RIGHT FIT BETWEEN SECTORS AND POLICIES	16
ADDRESSING INTERNATIONAL COMPETITIVENESS CONCERNS	17
CONCLUSIONS/NEXT STEPS	21
ATTACHMENT 1. APPEA'S CLIMATE CHANGE POLICY PRINCIPLES	22



INTRODUCTION

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 has been engaged in the greenhouse policy debate since its inception and has participated in every major consideration of national climate change policy approaches in Australia. APPEA has been engaged with policymakers, for example, on every consideration of an emissions trading scheme (ETS) commencing with the 1999 series of discussion papers released by the Australian Greenhouse Office.

APPEA welcomes the opportunity to provide comment to the Climate Change Authority (the Authority) on the *Updating the Authority's Previous Advice on Meeting the Paris Agreement: Consultation Paper, July 2019* (the Consultation Paper).

APPEA is committed to working with policymakers as they develop policy responses to climate change. With that in mind, APPEA has recently released a second edition of its *Climate Change Policy Principles* – a copy of which is at [Attachment 1](#)¹ – setting out the principles that APPEA considers should underpin Australia's response to climate change. The importance of these *Principles* in assessing future policy approaches is considered later in this submission.

Most importantly, APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions at least cost and facilitates broad-based investment decisions consistent with an international price on carbon.

APPEA is also a member of the Australian Industry Greenhouse Network (AIGN), a network of industry associations and individual businesses that contribute to the climate change policy debate and see value in joint industry action on climate change policy issues in order to promote sustainable industry development². APPEA has contributed to the AIGN submission to the Consultation Paper.

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

APPEA's submission addresses specific aspects of the Consultation 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 also important to place our views on the issues raised by the Authority in the Consultation Paper 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.

¹ A copy of APPEA's *Climate Change Policy Principles* can also be found at www.appea.com.au/2016/02/appea-updates-climate-change-policy-principles.

² See www.aign.net.au for further information.

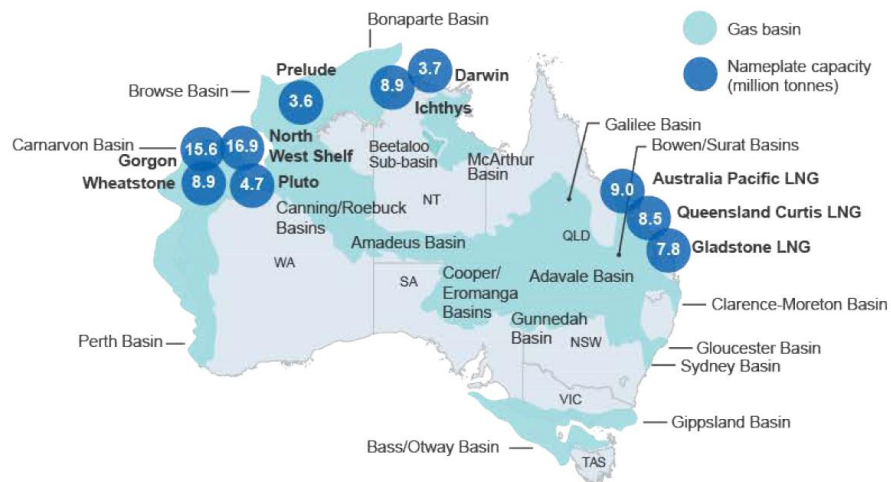
Reliable, secure and competitively priced energy is crucial to our everyday lives in Australia. Within this framework, oil and gas plays a key role in meeting many of our energy needs.

Our abundant natural gas resources, in particular, place Australia in an enviable position to maintain long-term, cleaner energy security domestically and internationally. Natural gas makes it possible for Australia to meet the world's growing energy needs over the coming decades while incorporating a strategy to curb emissions and address the risks posed by climate change.

The Australian oil and gas industry has invested over \$350 billion in natural gas production, transport, liquefaction and export facilities over the last decade. This investment will deliver returns for Australia for decades to come, through increased gas supply for Australian customers, export revenue, jobs, royalties and taxes.

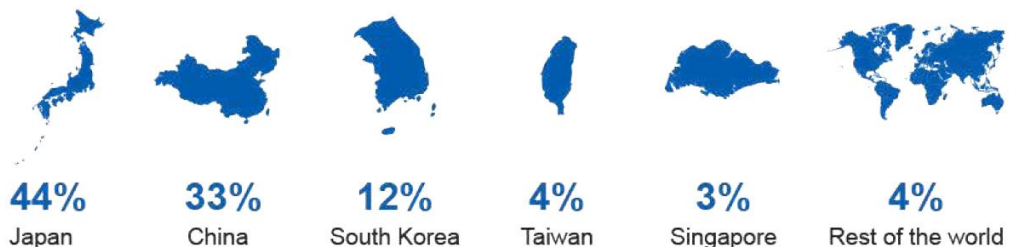
Liquefied natural gas (LNG) is now Australia's second largest export commodity after iron ore, with export revenue of over \$50 billion in 2018-19, and has more than doubled over the last two years (from \$22.3 billion in 2016-17). The oil and gas industry supports 80,000 jobs directly and indirectly in Australia and hundreds of thousands more in the manufacturing industry.

Figure 1: Australia's LNG projects and gas basins



Source: Department of Industry, Innovation and Science (2019).

Figure 2: Australia's LNG exports by destination, 2018



Source: Department of Industry, Innovation and Science (2019).



Figure 3: Share of world LNG exports, 2018



Source: Department of Industry, Innovation and Science (2019).

This means that the stakes are high in realising the industry's potential benefits.

THE KEY ROLE NATURAL GAS PLAYS IN REDUCING GLOBAL GREENHOUSE GAS EMISSIONS

Greater use of Australian natural gas – in the domestic market, and in Asia as LNG exports – can significantly reduce greenhouse gas emissions.

NATURAL GAS: INTEGRAL TO A LOW CARBON AUSTRALIAN ECONOMY

Australia could generate significant additional national economic, environmental and social benefits through greater utilisation of its substantial natural gas resources.

Gas has an essential role to play in reducing emissions. In the home, natural gas is a cleaner fuel and can see the emissions intensity of electricity generation in the National Electricity Market (NEM) fall. Gas-fired generators can be rapidly started making them complementary with intermittent renewable energy. Exporting gas as LNG will allow our Asian trading partners to reduce the emissions from their economies³.

Using more natural gas in Australia's power generation and resource processing would significantly enhance the nation's ability to meet increasing energy needs and reduce emissions.

These outcomes are possible because, as data on page 203 of the *Independent Review into the Future Security of the National Electricity Market – Blueprint for the Future* (the Final Report) shows⁴, available natural gas power generation technologies can reduce greenhouse gas emissions by 68 per cent compared to current brown coal generation technologies and 61 per cent compared to current black coal generation technologies.

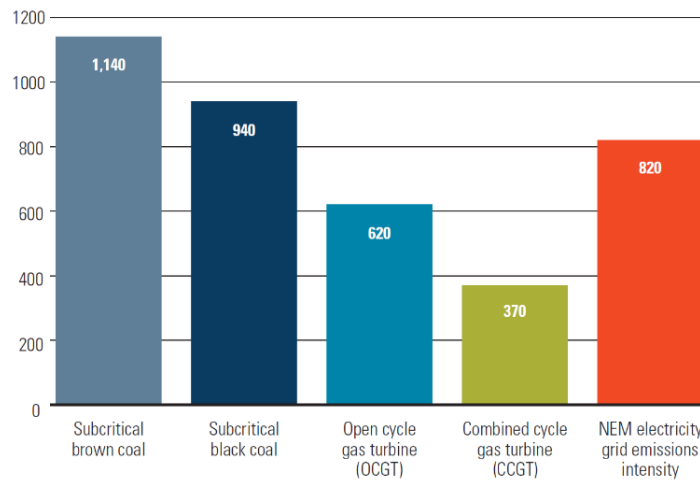
This is illustrated in Figure 4, which shows, using data from page 203 of the Final Report, the significantly lower greenhouse gas emission associated with the use of gas-fired power generation compared to the use of other conventional fuels.

³ See *Gas Vision 2050* for more information. *Gas Vision 2050* was developed by Australia's peak gas industry bodies and demonstrates how gas can continue to provide Australians with reliable and affordable energy in a low-carbon energy future. See www.appea.com.au/media_release/gas-vision-2050 and www.appea.com.au/wp-content/uploads/2017/03/GasVision2050_March2017.pdf for more information.

⁴ See www.energy.gov.au/publications/independent-review-future-security-national-electricity-market-blueprint-future for more information.



Figure 4. Estimated Operating Emissions for New Power Stations (kg CO₂-e/MWh)



Source: Data from *Independent Review into the Future Security of the National Electricity Market – Blueprint for the Future (2017)*.

The potentially growing role of natural gas considered in these reports reflects the role gas could play as a lower-emissions and cost effective generation technology, both in replacing coal-fired generation and in complementing the growth in renewable technologies.

Intermittent renewable energy requires “on call” electricity generation to manage falls in renewable output or peaks in demand. Gas-fired generation is a key technology capable of delivering that flexible response. As more renewable energy is integrated into the grid, this balancing role becomes more critical.

Experience in the United States demonstrates how quickly emissions from the generation sector can be cut by fuel switching. Data from the US Government Energy Information Administration (EIA)⁵ shows energy-related emissions in the US in the first six months of 2016 were at their lowest level since 1991, having fallen about 13 per cent from their peak in 2007. Amongst other reasons, this was possible because the US is developing its abundant natural gas resources. More recently, the EIA found⁶ emissions from power generation are expected to fall by over 2 per cent in 2019. The EIA noted:

Although the electric power sector is using more natural gas, EIA does not expect the increase in natural gas emissions in 2019 to offset the decrease in coal emissions because natural gas-fired electricity generation is less carbon-intensive than coal-fired electricity generation.

We have a similar opportunity in Australia. If the industry is able to develop them, there are sufficient natural gas resources to underpin a historic shift to a lower emissions generation sector, across Australia.

The increased use of natural gas also has several additional environmental benefits, such as:

- Reduced emissions of fine particulates.

⁵ See www.eia.gov/todayinenergy/detail.php?id=28312 and www.eia.gov/todayinenergy/detail.php?id=30712 for more information.

⁶ See www.eia.gov/todayinenergy/detail.php?id=40094 for more information.



- Reduced emissions of sulphur dioxide (an important contributor to smog and acid rain) and nitrogen oxides.
- Significantly lower demand for water for power station cooling.

Much greater use of Australia's extensive gas resources will be crucial in meeting the challenge of significantly reducing global greenhouse gas emissions at least cost whilst enhancing Australia's economic and export performance.

NATURAL GAS: INTEGRAL TO LOW CARBON ECONOMIES IN ASIA

In considering Australia's climate change policy responses both in the period to 2030, and beyond, and Australia's existing and future contribution to **global** emissions reduction efforts, it is important to acknowledge the positive contribution Australia's LNG exports make now and will increasingly make to that global effort.

Australia's LNG industry is in a unique position to contribute substantially to the economic development of the nation and to reduce greenhouse gas emissions. Australia's resources of natural gas and proximity to growing markets make us well-placed to meet the global climate change challenge while substantially contributing to Australia's economic growth.

While the demand for energy as part of the industrialisation of Asian economies is a key driver, the properties of natural gas as a lower emitting and cleaner burning fuel is also driving much of the international demand for LNG.

As the International Energy Agency (IEA) found in its *2018 World Energy Outlook (2018 WEO)*⁷, the use of natural gas is expected to grow consistently over the Outlook period (to 2040) under all scenarios. For example, in its 'New Policies Scenario'⁸ (the central scenario in the 2018 WEO) the IEA forecasts global natural gas demand to grow by around 45 per cent over the Outlook period. Average annual growth of 1.6 per cent means natural gas increases its share in global primary energy demand from 22 per cent today to 25 per cent in 2040. In the 'Sustainable Development Scenario'⁹, gas use plateaus from the 2030s, but the IEA notes, as a clean and flexible fuel, gas still sees its share increasing.

⁷ See www.iea.org/weo for more information.

⁸ According to the IEA, the 'New Policies Scenario' "... provides a measured assessment of where today's policy frameworks and ambitions, together with the continued evolution of known technologies, might take the energy sector in the coming decades. The policy ambitions include those that have been announced as of August 2018 and incorporates the commitments made in the Nationally Determined Contributions under the Paris Agreement, but does not speculate as to further evolution of these positions. Where commitments are aspirational, this scenario makes a judgement as to the likelihood of those commitments being met in full. It does not focus on achieving any particular outcome: it simply looks forward on the basis of announced policy ambitions."

⁹ The 'Sustainable Development Scenario', introduced for the first time in 2017, "... starts from selected key outcomes and then works back to the present to see how they might be achieved. The outcomes in question are the main energy-related components of the Sustainable Development Goals, agreed by 193 countries in 2015: Delivering on the Paris Agreement. The Sustainable Development Scenario is fully aligned with the Paris Agreement's goal of holding the increase in the global average temperature to "well below 2 °C". Achieving universal access to modern energy by 2030. Reducing dramatically the premature deaths due to energy-related air pollution. The Sustainable Development Scenario sets out the major changes that would be required to deliver these goals simultaneously."



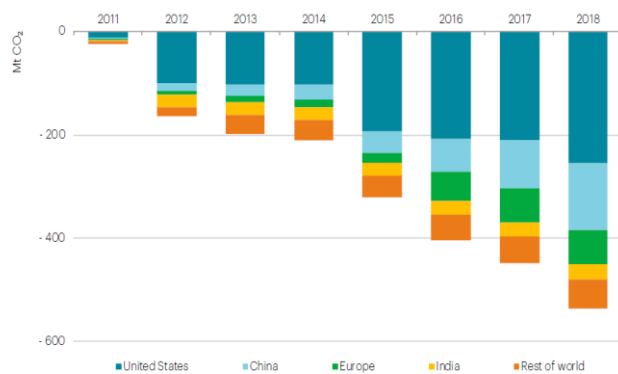
The IEA also expects LNG exports will overtake pipeline gas as the main form of long-distance trading, accounting for more than 60 per cent of inter-regional trade by 2040. This outlook is positive for Australia. Most of the growing demand for natural gas will come from China (as part of a long-term and deliberate coal-to-gas switching program¹⁰), India and other countries in Asia which are turning more and more to natural gas to help improve urban air quality.

More recently, the IEA's July 2019 report *The Role of Gas in Today's Energy Transitions*, examined the role of fuel switching, from coal to natural gas, to reduce greenhouse gas emissions and air pollutants globally¹¹. The report found that since 2010, coal-to-gas switching has saved around 500 million tonnes of CO₂ (see Figure 5 below) – the equivalent of putting an extra 200 million electric vehicles on the road running on zero-carbon electricity over the same period. The report also highlighted a significant opportunity in the global electricity generation sector to reduce emissions by switching from coal-fired power plants to gas-fired power plants, which presented “a potential quick win for emissions reductions”. The report found:

There is potential in today's power sector to reduce up to 1.2 gigatonnes of CO₂ emissions by switching from coal to existing gas-fired plants, if relative prices and regulation support this potential.

To put this opportunity in perspective, the potential for emission reductions across the global economy of 1.2 gigatonnes is more than double Australia's total annual emissions over the year to the March quarter 2019¹².

Figure 5. CO₂ savings from coal-to-gas switching by region compared with 2010



Note: Mt CO₂ = million tonnes carbon dioxide. Coal-to-gas switching includes emissions reductions in sectors where the market share of coal decreased, and the market share of gas increased within each region. The baseline increase in emissions assumes no improvement in the carbon intensity of energy or the energy intensity of gross domestic product (GDP) since 2010. Savings are calculated as those which occur compared to 2010.

Source: International Energy Agency (2019)

A 2008 (updated in 2011) study by WorleyParsons¹³, for example, compares lifecycle greenhouse gas emissions of Australian LNG exports from the North West Shelf Project with Australian east

¹⁰ For an overview of the role natural gas, including Australian LNG, plays in China's coal-to-gas switching program, see Oxford Institute for Energy Studies (2018), *The Outlook for Natural Gas and LNG in China in the War against Air Pollution*, December (available at www.oxfordenergy.org/publications/outlook-natural-gas-lng-china-war-air-pollution).

¹¹ See www.iea.org/publications/roleofgas for more information.

¹² According to the *Quarterly Update of Australia's National Greenhouse Gas Inventory for March 2019*, Australia's total emissions to the year to the March quarter 2019 were 538.9 Mt CO₂-e. See www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/quarterly-update-australias-nggi-mar-2019.

¹³ WorleyParsons (2008; 2011), *Greenhouse Gas Emissions Study of Australian LNG*, originally prepared August 2008; updated for public release, March 2011.

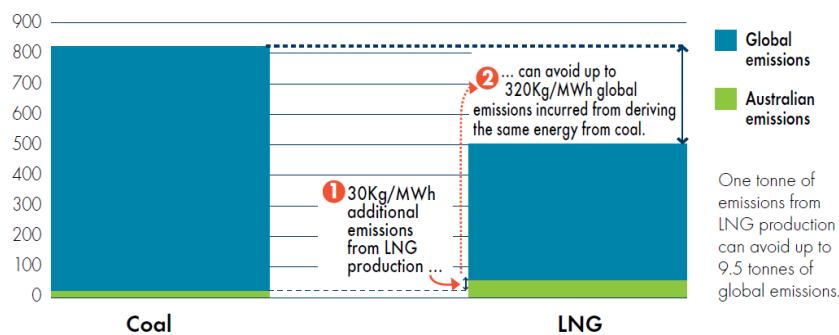


coast black coal exports in terms of lifecycle greenhouse gas emissions: from extraction and processing in Australia through to an end use of combustion (using different power generation technologies) in China for power generation.

Figure 6 below is derived from data within the study, and shows that:

- For every tonne of CO₂-e emitted in LNG production within Australia, between 5.5 and 9.5 tonnes of emissions from the coal alternative can be avoided globally.
- LNG has a substantially lower greenhouse footprint associated with it compared to coal – not just in combustion emissions, but throughout its lifecycle.
- The lifecycle greenhouse intensity for LNG is about 50 per cent lower than that of coal.

Figure 6. Displacement of Coal by LNG (kg/MWh CO₂-e by Fuel Source)



Source: Derived from data in WorleyParsons (2008; 2011).

A similar 2011 WorleyParsons study¹⁴ compared lifecycle greenhouse gas emissions of Australian LNG projects from Queensland using natural gas from coal seams as the fuel source with Australian east coast black coal exports. The analysis considered lifecycle greenhouse gas emissions: from extraction and processing in Australia through to an end use of combustion (using different power generation technologies) in China for power generation. It found that, in the case of Queensland LNG exports:

- For every tonne of CO₂-e emitted in LNG production within Australia, between 2.5 and 4.3 tonnes of emissions from the coal alternative can be avoided globally.
- Considering savings from a 30 year 10 million tonnes per year (Mtpa) Queensland onshore gas LNG project, if this gas is combusted in a combined cycle gas turbine (CCGT) plant instead of a subcritical coal plant, the life cycle emissions are 42.7 Mt CO₂-e per year, the annual savings 37.2 Mt CO₂-e and the project life savings 1,114 Mt CO₂-e¹⁵. For combustion in a CCGT plant instead of a supercritical coal plant the annual savings and project life savings are 21.7 Mt CO₂-e and 652 Mt CO₂-e respectively.

¹⁴ WorleyParsons (2011), *Greenhouse Gas Emissions Study of Australian CSG to LNG*, April (available at www.appea.com.au/wp-content/uploads/2013/05/FullReport_appea_worley_CSGemissions2011.pdf).

¹⁵ This compares to total Australian annual emissions in 2014-15 of 549.3 Mt CO₂-e (see www.environment.gov.au/climate-change/greenhouse-gas-measurement/publications#quarterly).



- The lifecycle greenhouse intensity for LNG is about 40 per cent lower than that of coal.

More recently, a landmark report by the CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA) confirmed the greenhouse gas emissions benefits from increased use of natural gas in domestic and export markets.

The report¹⁶ *Whole of Life Greenhouse Gas Emissions Assessment of a Coal Seam Gas to Liquefied Natural Gas Project* analysed life cycle emissions, including extraction, transportation and usage of coal seam gas (CSG) in Queensland's Surat Basin.

The report presents a comparison of greenhouse gas emissions from electricity production in Australia from Queensland thermal coal or natural gas derived from CSG operations which finds – incorporating the full life cycle of greenhouse gas emissions from all parts of the supply chain – a reduction in emissions of up to 50 per cent.

This is the first time accurate estimates of life cycle greenhouse gas emissions associated with an operating CSG to LNG project in Australia have been used – and provide data about the benefits of natural gas for electricity generation.

The report found

... considerable climate benefits are possible where natural gas replaced coal for electricity generation; particularly in developing countries.

Another recent CSIRO study¹⁷ on *Characterisation of Regional Fluxes of Methane in the Surat Basin, Queensland* confirmed the robustness of the national greenhouse accounts estimates. The study found that upstream fugitive methane leakage rates are less than 0.5 per cent of CSG production. This new estimate validates the upstream leakage rates estimated from data in the national inventory, of around 0.4 per cent for the region.

The methane leakage rate for the entire Australian gas production system – both upstream and downstream – is around 0.7 per cent of total gas production. This compares favourably with the methane leakage rate of US gas production which is around 1.2 per cent.

In addition, burning gas instead of coal improves urban air quality. This is particularly important in many Asian countries that are importing Australian LNG or considering imports.

According to recent Australian government estimates, Australian LNG exports in the year to March 2019 have the potential to reduce greenhouse gas emissions by 152 million tonnes in customer nations, equivalent to 28 per cent of Australia's emissions during that same period¹⁸.

In addition, and as noted above, burning gas instead of coal improves urban air quality. This is particularly important in many Asian countries that are importing Australian LNG or considering imports.

There are significant benefits to Australia and internationally from the greater use of gas as a lower greenhouse gas emitting energy source.

¹⁶ See gisera.csiro.au/project/whole-of-life-cycle-greenhouse-gas-assessment for more information.

¹⁷ See gisera.csiro.au/wp-content/uploads/2018/10/GHG-1-Final-Report.pdf for more information.

¹⁸ See minister.environment.gov.au/taylor/news/2019/australias-national-greenhouse-gas-inventory-march-2019-quarterly-update-released for more information.



Much greater use of Australia's extensive gas resources will be crucial in meeting the challenge of significantly reducing global greenhouse gas emissions at lowest possible cost whilst enhancing Australia's economic and export performance.

The Authority should in its Final Report and advice to government recognise the vital role Australian LNG exports can play in global greenhouse emissions reductions.

COMMENTS ON SPECIFIC ISSUES RELEVANT TO THE CONSULTATION PAPER

PRINCIPLES FOR ASSESSING POLICIES

APPEA notes the Consultation Paper in Box 2 sets out principles that the Authority uses when assess the relative merits of emissions reduction policies. APPEA further notes this framework, at its core, comprises three key principles: economic efficiency, environmental effectiveness; and equity.

As noted earlier in this submission, APPEA has developed a set of *Climate Change Policy Principles* to assist policymakers in developing efficient and effective responses to deal with climate change.

As part of this, APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions at least cost and facilitates broad-based investment decisions consistent with an international price on carbon. That should be the overarching objective of Australia's policy response and a key feature of the Authority's evaluation framework.

APPEA's *Climate Change Policy Principles*, reproduced in Box 1, contain four key points:

1. International engagement is crucial.
2. Climate change and energy policies must be integrated and harmonised.
3. Climate change adaptation strategies are necessary.
4. Climate policy must not compromise national or global economic development or energy security.

In considering the APPEA *Climate Change Policy Principles* and the evaluation framework set out by the Authority, APPEA makes the following comments:

- APPEA agrees with the Authority that policies should help Australia meet its emissions reduction goals at least cost and that these costs have a number of elements (direct costs, indirect costs and compliance and administration costs), all of which should be kept as low as possible.
 - While keeping the whole of these costs as low as possible is vital, the distribution of costs remains important and the impact on particular groups (for example, trade-exposed industries) is a critical element of ensuring policy options facilitate efficient and broad-based investment decisions.
 - The costs of climate change mitigation are borne by: trade-exposed industries where they are placed at a competitive disadvantage compared to competing industries in other countries; domestic consumers where the cost of addressing climate change is reflected in higher domestic prices; and taxpayers where climate change policies are funded by the government. This reinforces the importance of minimising the quantum of costs and being conscious of their distribution when evaluating and designing policies.



- APPEA welcomes the recognition by the Authority, when discussing the importance of environmental effectiveness, that such effectiveness should be seen from a global perspective. There are three aspects that are important.
 - In particular, APPEA's *Principles* highlighted the important role international permits and credits can play and highlight that APPEA supports a policy that allows for the unrestricted flow of credible emissions units between international jurisdictions.
 - The environmental effectiveness of Australia's policies can be eroded if they trigger increases in emissions in other countries (noting, as will be considered further below, this is only one aspect of the importance of ensuring that the international competitiveness of trade-exposed industries are maintained).
 - The third and equally important element is the positive role cleaner energy exports, such as LNG, play now and will increasingly play in the future in contributing substantially to the economic development of the nation and to reduce greenhouse gas emissions. These issues were considered earlier in this submission, but are an equally important element of the environmental effectiveness of any climate change policy response.
- A key aspect of the Authority's consideration of horizontal equity extends to the international competitiveness of trade-exposed industries. These industries should be treated in a similar way to trade competitors, where those competitors do not face carbon costs that could be faced by Australian companies. These issues are considered in detail below.

Box 1. APPEA's Climate Change Policy Principles

1. International engagement is crucial.

Australia should continue to engage the international community to pursue environmentally effective and economically efficient climate change policies¹.

An international policy framework should:

- Promote international participation.
- Minimise the costs and distribute the international burden equitably.
- Be comprehensive in its coverage.
- Allow for the unrestricted flow of credible emissions units between international jurisdictions.
- Be underpinned by transparent reporting arrangements.

2. Climate change and energy policies must be integrated and harmonised.

Australia's policy response should seek to:

- Deliver lowest cost greenhouse gas emissions abatement through an appropriately designed mechanism that provides an economy-wide transparent price signal to shape business and consumer plans and investments. The mechanism should be efficient, have low compliance costs, and support international trade that recognises different national circumstances.
- Recognise and allow the use of the widest range of credible domestic and international offsets.
- Provide a level playing field for new entrants.
- Avoid penalising early movers who have previously implemented abatement measures.
- Support research into low-emissions technologies, and development and deployment of such technologies.

In the event Australia takes action before comparable action is taken by the nations with which we compete, the Australian policy response should maintain the competitiveness of Australian trade exposed industries, such as LNG, by minimising the costs the industry faces in the absence of a carbon price being imposed on energy sources in customer countries and competitors.

Policies inconsistent with the principles should be phased out and additional measures should only apply to sectors of the economy that are not covered by the price signal on greenhouse gas emissions.

3. Climate change adaptation strategies are necessary.

Australia must:

- Continue to support international and national modelling to provide location-specific climate change forecasts.
- Develop risk-management strategies to reflect likely impacts of climate variability.

4. Climate policy must not compromise national or global economic development or energy security.

Australia's policy response should recognise that:

- Increasing global population and urbanisation generate growing demand for energy.
- Secure energy supply is crucial for a strong modern economy and a healthy, vibrant society.
- Natural gas has a key role to play in the transition to a low-carbon economy – switching to gas could halve the emissions from the Australian electricity sector – and if solar and wind power are to deliver genuine emissions reductions they must have gas-fired back-up.

¹ Australia's contribution to the global climate change effort as set out here reflects the principle in Article 3.1 of the United Nations Framework Convention on Climate Change (UNFCCC) (see unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/convention.pdf) in determining Australia's differentiated responsibilities and capabilities, consideration should be given to matters such as Australia's economic growth and structure, population growth, energy production and energy use.



PREVIOUS RECOMMENDATIONS

As noted above, APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions at least cost and facilitates broad-based investment decisions consistent with an international price on carbon.

APPEA's *Climate Change Policy Principles* have been developed to assist policymakers in developing efficient and effective responses to deal with climate change and to assess policies of the kind outlined in Chapter 4 of the Draft Report.

In particular, as the *Principles* note, Australia's climate change policy response should seek to:

- Deliver lowest cost greenhouse gas emissions abatement through an appropriately designed mechanism that provides an economy-wide transparent price signal to shape business and consumer plans and investments. The mechanism should be efficient, have low compliance costs, and support international trade that recognises different national circumstances.
- Recognise and allow the use of the widest range of credible domestic and international offsets.
 - Allowing access to international carbon credits/permits is vital to ensuring any policy approach is able to drive low cost and effective emissions reductions both in Australia and across the region. APPEA has long advocated the use of credible international permits/credits in order to meet any obligation under Australian laws to manage greenhouse gas emissions.
 - Access to international permits can be designed to ensure that only credible permit/credits, on an approved list, are valid under the policy approach.
- Provide a level playing field for new entrants.
- Avoid penalising early movers who have previously implemented abatement measures.
- Support research into low-emissions technologies, and development and deployment of such technologies.

Most importantly, and as will be considered further below, in the event Australia takes action before comparable action is taken by the nations with which we compete, the Australian policy response should maintain the competitiveness of Australian trade exposed industries, such as LNG, by minimising the costs the industry faces in the absence of a carbon price being imposed on energy sources in customer countries and competitors.

Policies inconsistent with the *Principles* should be phased out and additional measures should only apply to sectors of the economy that are not covered by the price signal on greenhouse gas emissions.

With that in mind, APPEA notes the Authority's previous advice on the ERF safeguard mechanism were not taken up by the Government and that the Government has since made a number of amendments to the mechanism and is consulting at present on the development of default production variables and default emissions intensity.

The industry is focussed on its engagement with the Government and the Department of the Environment and Energy on these issues and sees little need to revisit the recommendations on the safeguard mechanism contained in the Authority's previous advice.

The exception to this recommendation is the access to international credits and permits. APPEA supports the Authority's advice to provide for access to credible international credits and permits.



APPEA recommends emission baselines under the ERF Safeguard Mechanism to be assessed against 'net' emissions where offsets can include a range of credits (including access to credible international credits/permits). In addition, APPEA recommends the use of credible international credits/permits be allowed to meet any compliance obligation that may arise from the Safeguard Mechanism or other aspects of the ERF.

APPEA encourages Australia to continue play an active role in international negotiations around the Paris Agreement rules (particularly Article 6) that will underpin access to these credible credits/permits.

These proposals are consistent with the objective of achieving Australia's emissions reduction targets at lowest cost to the Australian economy.

KEY AREAS OF INVESTIGATION

Previous Recommendations

APPEA's views on the Authority's advice relating to the ERF safeguard mechanism and access to international credits and permits was considered above.

Achieving a net zero emissions economy in the long-term (including a long-term emissions reduction goal for Australia beyond 2030)

In Australia's submission to the Paris process in August 2015, Australia committed to consider a potential long-term emissions reduction goal beyond 2030 and also committed to review existing targets every five years. This could, over time include its view on setting targets for net zero emissions in the longer-term, noting the Paris Agreement's commitment to achieving net zero emissions in the second half of the century¹⁹.

APPEA's view on setting emissions reduction targets, or reviewing existing targets, was set out in APPEA's April 2015 submission²⁰ to the *Setting Australia's post-2020 target for greenhouse gas emissions: Issues Paper*.

In that submission, APPEA recommended that in setting Australia's emission reduction goals, including a longer-term goal beyond 2030, or reviewing existing targets, the key consideration is that Australia should make an equitable contribution, in accordance with its differentiated responsibilities and respective capability to global action, to reduce greenhouse gas emissions.

Australia should continue to engage the international community in pursuing identified and beneficial environmental outcomes through greenhouse gas emissions reduction action. Given the global nature of climate change and economic activity, the international context is important when considering an appropriate emissions reduction target for Australia. The international context is also relevant to how Australia's economy will change over time, and can affect the competitiveness

¹⁹ Specifically, Article 4.1 says "In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty."

²⁰ See www.dpmc.gov.au/sites/default/files/unfccc-public-submissions/APPEA%20Submission%2C%20240415.pdf for a copy of the APPEA submission.



of Australian industry. This last issue is of particular importance, but is often overlooked in the public debate on international action.

A key area of focus for Australia's upstream oil and gas industry, particularly the export-focused LNG industry, is the action of Australia's trade competitors. One of the key factors to consider when assessing any changes to Australia's emissions reduction targets is the action – or inaction – of trade competitors.

The Centre for International Economics (CIE) report, *Understanding emissions reduction efforts*²¹, notes Australia's emission reduction target, or changes to an existing target, should be set with a clear understanding of the implications of the target for the Australian economy and industries. This understanding should also be informed by comparing Australia's level of effort with the level of effort to reduce greenhouse gas emissions by other countries. The CIE finds that this relevant information is the amount of abatement the target requires (that is, the volume of emission reduction compared to a situation where there was no target) and the cost or impost of achieving that emissions reduction.

The report also finds the most appropriate measure of the level of 'effort' is the cost of climate policies to reach the proposed target. Climate change policies can impose costs through different means, but all policies that induce a change in behaviour effectively impose a cost by requiring a shift to less cost effective, but also less emission intensive, production.

The most significant concern associated with greater action to address climate change is the cost of taking such action. Costs of climate change mitigation are borne by trade-exposed industries where they are placed at a competitive disadvantage compared to competing industries in other countries, domestic consumers where the cost of addressing climate change is reflected in higher domestic prices and taxpayers where climate change policies are funded by the government.

As cost is the primary justification for limiting the extent of climate change mitigation, cost is clearly a relevant metric for assessing the level of 'effort' a country is making.

APPEA recommends that in considering any potential long-term emissions reduction goal for Australia beyond 2030, including for net zero emissions in the second half of the century, the Government establish a process similar to the 2015 UNFCCC Task Force process used to develop recommendations for Australia's emission reduction target to 2030.

An alternative approach would be to task the Productivity Commission to conduct a public inquiry into the target, or to review existing targets, before making recommendations to Government.

Whichever approach is used, such a process should include public consultation, and a complete analysis, including economic modelling, of the implications of the proposed target, or changes to any existing target, for Australia's economic and social conditions.

The particular importance of the treatment of trade-exposed industries, is considered further below.

²¹ See www.aign.net.au/file_download/1090/CIE+report+Understanding+emission+reduction+efforts+24+April+2015.pdf for more information.



Sectoral and economy-wide policies

Barriers to ERF participation

APPEA has previously identified a number of barriers that have prevented greater industry participation in the ERF. Changes to the ERF to remove/reduce these barriers should be a focus of the Authority's updated advice.

Within that context, APPEA notes the Emissions Reduction Assurance Committee (ERAC) recently reviewed the *Carbon Credits (Carbon Farming Initiative—Facilities) Methodology Determination 2015* following a very low take-up rate for that Method²².

Key amongst these barriers are:

- Relatively short contract periods, which can prevent larger, longer-term and capital-intensive projects from seeking funding and contracts.
- The ERF's 'make good' provisions, which can raise the cost and risk of ERF participation to levels that prevent participation.
- The need, under the facilities method, amongst others, to

APPEA was also involved in 2015 in consultation with the Department to develop the *Carbon Credits (Carbon Farming Initiative – Oil and Gas Fugitives) Methodology Determination 2015*, which was made on 4 August 2015²³. The Determination covers projects that reduce fugitive emissions from venting at oil and natural gas extraction, production, transport and processing facilities.

While the Determination was developed in consultation with the industry, it was noted at the time the administrative complexity of the proposed approach may be a barrier to its use. This has so far proven to be the case, with few projects coming forward to bid into an ERF Auction.

To encourage greater participation in the ERF, the Authority could provide advice to:

- Lengthen the potential contract period (by allowing, for example, allowing the duration of contracts to be a matter agreed between the Clean Energy Regulator and successful ERF Auction participants).
- Remove the 'make good' provisions (to recognise that an appropriately applied prequalification process removes the need for 'make good' provisions).
- Streamline administrative and method development processes.
- Consider in consultation with industry, ways to improve the attractiveness of the ERF to large industrial facilities. This could be through a separate and focussed investigation by ERAC and the Department.

Carbon capture utilisation and storage (CCUS)/Greenhouse gas storage

Greenhouse gas storage is the process whereby large volumes of captured carbon dioxide are safely injected and stored deep underground rather than being released to the atmosphere. It is seen as

²² See www.environment.gov.au/climate-change/government/emissions-reduction-fund/consultation/facilities.

²³ See www.environment.gov.au/climate-change/emissions-reduction-fund/methods/oil-gas-fugitives and www.environment.gov.au/system/files/resources/f1997f9e-a2d1-4b5c-929b-861d6efeafd9/files/factsheet-oil-gas-fugitives-method.pdf for more information.



one of the pathways enabling the continued use of fossil fuels in a low-carbon economy and may be vital in reducing emissions from industries such as steel and cement manufacture.

Since 1996 the global oil and gas industry has led the world in the practical deployment of this technology. 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 taken over by CO2CRC Limited. They are recognised as one of the world's leading collaborative research organisations focused on carbon capture and storage. The CO2CRC continues to receive backing from the oil and gas industry.

The Australian industry has privately funded several hundred million dollars undertaking detailed storage site and project scoping assessments in the Perth, Carnarvon, Browse, Bonaparte and Cooper Basins. The Gorgon Project on Barrow Island, operated by Chevron, includes the Gorgon Carbon Dioxide Injection Project, the safe underground injection and storage of between 3.4-4.0 million tonnes CO₂-e greenhouse gases per year, or around 100 million tonnes over the life of the project²⁴.

CCUS offers a potentially important opportunity for Australia to achieve large-scale emissions reductions at low abatement cost. Enhanced oil recovery (EOR) can, for example, assist to offset the capital and operating costs of CCUS as we learn more about the technology. It remains the case, however, for large-scale CCUS that provides an opportunity for other industries to access CCUS hubs, a number of enablers will be required.

Key amongst these in the short-term is the ability to generate tradeable ACCUs for permanently stored CO₂, including CO₂ permanently stored when used for EOR. Additional enablers include eligibility for clean energy funding through the Clean Energy Finance Corporation (CEFC) and a regulatory framework that supports commercialisation and minimises risks.

Supporting innovation, finance and new industries

APPEA recommends the Authority consider the role of research into low-emissions technologies, and development and deployment of such technologies. APPEA believes that a pathway to reducing emissions considerably must be founded on a strong research, development and demonstration (RD&D) effort across a very wide range of opportunities. Government has a role to play in providing support for this RD&D effort.

As noted above, this support should include amendment to the investment mandate of the CEFC to remove the current prohibition on CEFC financing for CCUS projects. Removing this prohibition would offer tangible support for this potentially important technology.

FINDING THE RIGHT FIT BETWEEN SECTORS AND POLICIES

Any "suite" of climate change policies must operate in a cohesive way to keep costs low and minimise competitive distortions.

²⁴ See australia.chevron.com/news/2019/carbon-dioxide-injection and australia.chevron.com/our-businesses/gorgon-project for more information.



This means that with a national greenhouse policy approach in place (such as the Climate Solutions Package), any additional measures targeted at reducing greenhouse gas emissions should only apply to sectors of the economy that are not covered by the national approach.

This is not the case at present, and means there is an urgent need to comprehensively streamline Australia's greenhouse policies and programmes. It is imperative that governments expedite the removal of the plethora of other policies and programmes regulating greenhouse gas emissions in Australia.

The growth of separate Australian Government and State and Territory Government policies and greenhouse initiatives, which has accelerated in recent years, and their lack of consistency are increasing costs and uncertainty for Australian industry, including the upstream oil and gas industry.

This cost and uncertainty and the associated policy risk, misallocation of resources and deadweight losses to the economy associated with the hotchpotch of greenhouse measures in Australia is significant and is growing.

A single, nationally coordinated approach by all Australian governments is urgently required. In particular, State governments should not introduce policies and mechanisms inconsistent with a national approach.

A significant rationalisation of greenhouse measures across all Australian jurisdictions is urgently required. Every existing measure should be subjected to a rigorous cost-benefit analysis and only those measures that can definitively demonstrate their net benefits should be considered for retention. Under no circumstances should any policy option recommended by the Authority merely be added to the hotchpotch of existing measures.

The Authority's updated advice to the Government could recommend this review be undertaken through COAG and its relevant Ministerial Councils. This review could also examine the role of the Authority itself to provide advice to state and territory governments on climate change policy, including the need for complementary policies across jurisdictions.

ADDRESSING INTERNATIONAL COMPETITIVENESS CONCERNS

The major challenge to the upstream oil and industry's continued growth is maintaining Australia's international competitiveness in the face of challenging market conditions and growing global competition. In the case of LNG exports, a high-cost local environment and the emergence of new LNG competitors in East Africa, North America and other locations has increased the level of competition Australia faces as it seeks to win market share and attract investment.

Some factors affecting current and future investment, such as the fall in oil prices, are beyond the ability of the Australian industry to influence. However, other key challenges must be addressed. In particular, the industry and its suppliers need to work harder at constraining cost growth and to meeting skilled labour requirements while government focuses on streamlining policy and reducing green and red tape.

There are also critical policy areas that require genuine reform. Australia's national approach to climate change policy is one of those critical areas. The development of the any climate change policy approach should be aimed at enhancing Australia's international competitiveness as a destination for oil and gas investments. It should not add to the cost burden facing the industry.



The importance of this issue cannot be underestimated: any climate change policy approach that imposes costs on Australian industry that its competitors do not face would be highly prejudicial to Australia's economic performance without a provision to preserve industry's international competitiveness.

The key issue for the upstream oil and gas industry in this area is the treatment of trade-exposed industries. As has been considered and accepted by every major credible analysis of, for example, an emissions trading scheme undertaken in Australia and internationally, if policies and measures such as emissions trading schemes (or other policy options that impose an effective price on carbon) are implemented in some countries and not in others, there will be distortions. These distortions will occur as a result of the escalation in production costs in the countries that have implemented greenhouse policies relative to those that have not.

As was outlined earlier, APPEA has considered this issue as part of its *Climate Change Policy Principles*, which note the following

In the event Australia takes action before comparable action is taken by the nations with which we compete, the Australian policy response should maintain the competitiveness of Australian trade exposed industries, such as LNG, by minimising the costs the industry faces in the absence of a carbon price being imposed on energy sources in customer countries and competitors.

In addition, given the global nature of climate change and economic activity, the international context is important when considering Australia's climate policy options. The international context is also relevant to how Australia's economy will change over time, and can affect the competitiveness of Australian industry. This last issue is of particular importance, but is often overlooked in the public debate on international action.

A key area of focus for Australia's upstream oil and gas industry, particularly the export-focused LNG industry, is the action of Australia's trade competitors. One of the key factors to consider when assessing any policy approach is the action or inaction of trade competitors.

The importance of this issue has not been lessened by the Paris Agreement. The Paris Agreement is an important step in the world moving together on climate change. However, it still shows significant differences between countries in their targets and, importantly, the resultant impact on businesses. Until our major competitors are imposing comparable costs, issues around trade competitiveness remain valid in any future policy development in Australia, and must be addressed to minimise differences in the cost of carbon.

The Authority should, in addition to focussing on "major emitters" and "trading partners" in assessing Australia's climate policy options, recognise that while important, major emitters and trading partners are only part of the story. It is the actions of trade competitors that form the key issue for LNG exporters.

The growth in LNG demand has been driven by the economic and industrial transformation of key economies in the Asia-Pacific region. In supplying LNG to the region, Australia's LNG projects face fierce global competition.

Table 1 below lists the specific actions being taken in a number of trading partner and competitor countries – specifically the nature of the National Determined Contribution (NDC) lodged with the

UNFCCC²⁵ under the Paris Agreement– and data from the *BP Statistical Review of World Energy, June 2019*²⁶.

Table 1: LNG Exporters and NDCs

Country	LNG exports (bcm)	LNG exports (%)	INDC
United States	28.4	6.6	NDC (a 26-28% reduction on 2005 levels by 2025) to be met through a range of regulatory instruments (and a range of state-based measures, which may include market-based mechanisms). No economy-wide emissions trading scheme (ETS) or other form of carbon price proposed. Cost implications for LNG exporters unclear at this stage. On 1 June 2017, the US President announced ²⁷ on that the US would be withdrawing from the Paris Agreement.
Trinidad and Tobago	16.8	3.9	NDC (a 15% reduction on BAU levels by 2030) is based on its Carbon Reduction Strategy developed for the power generation, transportation and industrial sectors. Actions conditional on access to finance through the Green Climate Fund. Costs for LNG exporters unclear but likely to be small. No ETS proposed.
Peru	4.8	1.1	NDC (a 30% reduction on BAU levels by 2030, partly (10%) conditional on international financing). Costs for LNG exporters unclear but likely to be small. No ETS proposed.
Norway	6.6	1.5	NDC (40% reduction on 1990 levels by 2030) to be met through participation in the EU ETS and international market mechanisms.
Other Europe	6.0	1.2	--
Russian Federation	24.9	5.8	NDC (25-30% reduction on 1990 levels by 2030) to be met through mechanisms to be developed. Implications for LNG unclear but likely to be small. No ETS proposed.
Oman	13.6	3.1	NDC (a 2% on BAU levels by 2030). Costs for LNG exporters unclear but likely to be small (mitigation action includes "reduction in flaring"). No ETS proposed.
Qatar	104.8	24.3	NDC does not set out a specific emissions reduction target and none of the actions proposed would have cost implications for LNG exports. No ETS proposed.
United Arab Emirates	7.4	1.7	NDC does not set out a specific emissions reduction target and none of the actions proposed would have cost implications for LNG exports. No ETS proposed.
Algeria	13.5	3.1	NDC (a 7-22% reduction on BAU by 2030, conditional on international support). Costs for LNG exporters unclear but likely to be small (mitigation action includes "reduction in flaring"). No ETS proposed.
Angola	5.2	1.2	NDC (a 35% reduction on BAU by 2030 and an additional 15% conditional on international support). None of the actions proposed would have cost implications for LNG exports. No ETS proposed.
Egypt	2.0	0.5	NDC does not set out a specific emissions reduction target. Costs for LNG exporters unclear but likely to be small (mitigation action includes "reduction in flaring"). "A national market for carbon trading may be established" (but no further details provided).
Nigeria	27.8	6.5	NDC (a 20% reduction on BAU levels by 2030 unconditional, 45% conditional on international support). Costs for LNG exporters unclear but likely to be small

²⁵ See www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx for further information.

²⁶ See www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html for further information.

²⁷ See www.whitehouse.gov/briefings-statements/statement-president-trump-paris-climate-agreement for further information. Under Article 28 of the Agreement, the earliest possible effective withdrawal date by the US cannot be before 4 November 2020, four years after the Agreement came into effect in the United States.



			(mitigation action includes "work towards ending gas flaring by 2030"). No ETS proposed.
Other Africa (mostly Equatorial Guinea)	5.4	1.3	Equatorial Guinea's NDC (a 20% reduction on BAU levels by 2030, conditional on international support). Costs for LNG exporters unclear but likely to be small. No ETS proposed.
Brunei	8.8	2.0	NDC does not include a specific emissions reduction target (but does target a reduction in total energy consumption by 63% by 2035 compared to BAU). Costs for LNG exporters unclear but likely to be small. No ETS proposed.
Indonesia	20.8	4.8	NDC (a 29% reduction on BAU levels by 2030 unconditional). Costs for LNG exporters unclear but likely to be small. No ETS proposed.
Malaysia	33.0	7.7	NDC (a reduction in the emissions intensity of GDP by 45% by 2030 relative to 2005. This consists of 35% on an unconditional basis and a further 10% is conditional upon international support). Costs for LNG exporters unclear but likely to be small. No ETS proposed.
Papua New Guinea	9.5	2.2	NDC does not set out a specific emissions reduction target and none of the actions proposed would have cost implications for LNG exports. No ETS proposed.
Australia	91.8	21.3	NDC (a reduction in emissions of 26-28% on 2005 levels by 2030) ²⁸ .

Source: UNFCCC (2019); BP (2019).

Table 1 shows that of the 19 countries/regions listed (including Australia), very few have NDCs that propose direct or significant costs for LNG exporters. In most cases, greenhouse policy initiatives that do apply are unlikely to have a material impact on their LNG industries. None, with the exception of Norway (already a participant in the EU ETS and not a direct competitor for Australian LNG) proposes an emissions trading scheme.

A number of countries do not set out a specific emissions reduction target and none of the actions they propose would have cost implications for LNG exports. This includes Qatar, one of Australia's major LNG competitors and one of the world's largest exporters of LNG (with around 26 per cent of global exports).

Future competition (along with that from the United States) is likely to come from east Africa, a region that could not be said to be at the forefront of greenhouse gas reduction policy action.

In summary, the analysis shows that very few of Australia's major LNG competitors are taking on emissions reduction obligations that will place a cost of LNG exporters. Further, notwithstanding the NDC process forming part of the Paris Agreement, the prospect of our competitors taking meaningful action in the foreseeable future remains low.

In addition, natural gas exports compete for market share with other energy sources, such as coal. In a similar way, many of the major coal exporters (or, in a number of countries, major producers of coal for domestic use in their own right) are also countries that do not have meaningful climate action in place. This places similar competitive pressure on Australian LNG exports.

²⁸ See dfat.gov.au/international-relations/themes/climate-change/Pages/international-cooperation-on-climate-change.aspx for further information. Australia's INDC can be found at www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Australia/1/Australias%20Intended%20Nationally%20Determined%20Contribution%20to%20a%20new%20Climate%20Change%20Agreement%20-%20August%202015.pdf.



The continued expansion of Australia's oil and gas industry represents incredible opportunities to all Australians. Australia should be capitalising on these opportunities and maximising growth in living standards and employment by efficiently allocating resources. The economic advancement in our region is overwhelmingly positive for the nation, playing to our comparative advantages as a secure and reliable energy exporter.

CONCLUSIONS/NEXT STEPS

Our abundant natural gas resources place Australia in an enviable position to maintain long-term, cleaner energy security domestically and internationally. Natural gas makes it possible for Australia to meet the world's growing energy needs over the coming decades while incorporating a strategy to curb emissions and address the risk of climate change.

APPEA will continue to participate in the Authority's work and looks forward to ongoing consultation ahead of the release of the update to the Authority's advice at the end of 2019.



ATTACHMENT 1. APPEA'S CLIMATE CHANGE POLICY PRINCIPLES



Climate change policy principles

Second edition: December 2015
Australian Petroleum Production & Exploration Association



**APPEA has developed these
climate change policy
principles to assist policymakers
in developing efficient and
effective responses to deal with
climate change.**

APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions at least cost and facilitates broad-based investment decisions consistent with an international price on carbon.

Climate policy must be fully integrated and consistent with policies in other areas – including energy, international trade, taxation, economic growth, population, and environmental and social responsibility.



Policy principles

1. International engagement is crucial.

Australia should continue to engage the international community to pursue environmentally effective and economically efficient climate change policies¹.

An international policy framework should:

- Promote international participation.
- Minimise the costs and distribute the international burden equitably.
- Be comprehensive in its coverage.
- Allow for the unrestricted flow of credible emissions units between international jurisdictions.
- Be underpinned by transparent reporting arrangements.

2. Climate change and energy policies must be integrated and harmonised.

Australia's policy response should seek to:

- Deliver lowest cost greenhouse gas emissions abatement through an appropriately designed mechanism that provides an economy-wide transparent price signal to shape business and consumer plans and investments. The mechanism should be efficient, have low compliance costs, and support international trade that recognises different national circumstances.
- Recognise and allow the use of the widest range of credible domestic and international offsets.
- Provide a level playing field for new entrants.
- Avoid penalising early movers who have previously implemented abatement measures.
- Support research into low-emissions technologies, and development and deployment of such technologies.

In the event Australia takes action before comparable action is taken by the nations with which we compete, the Australian policy response should maintain the competitiveness of Australian trade exposed industries, such as LNG, by minimising the costs the industry faces in the absence of a carbon price being imposed on energy sources in customer countries and competitors.

Policies inconsistent with the principles should be phased out and additional measures should only apply to sectors of the economy that are not covered by the price signal on greenhouse gas emissions.

3. Climate change adaptation strategies are necessary.

Australia must:

- Continue to support international and national modelling to provide location-specific climate change forecasts.
- Develop risk-management strategies to reflect likely impacts of climate variability.

4. Climate policy must not compromise national or global economic development or energy security.

Australia's policy response should recognise that:

- Increasing global population and urbanisation generate growing demand for energy.
- Secure energy supply is crucial for a strong modern economy and a healthy, vibrant society.
- Natural gas has a key role to play in the transition to a low-carbon economy – switching to gas could halve the emissions from the Australian electricity sector – and if solar and wind power are to deliver genuine emissions reductions they must have gas-fired back-up.

¹ Australia's contribution to the global climate change effort as set out here reflects the principle in Article 3.1 of the United Nations Framework Convention on Climate Change (UNFCCC) (see unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf). In determining Australia's differentiated responsibilities and capabilities, consideration should be given to matters such as Australia's economic growth and structure, population growth, energy production and energy use.



Australian LNG exports can make an important contribution to reducing global greenhouse emissions intensity.

The global challenge

Throughout the world, policymakers are implementing a variety of regulatory responses to reduce greenhouse gas emissions and mitigate the risks of global climate change.

The Intergovernmental Panel on Climate Change (IPCC) found in its Fifth Assessment Report (AR5) that:

- The human influence on the climate system is clear.
- The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts.
- Humans can limit climate change and build a more prosperous, sustainable future.²

The multilateral United Nations Framework Convention on Climate Change (UNFCCC) has elicited a global commitment to holding the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and to pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels.³

APPEA's stance on climate change

Societies around the world will continue to face two major, interdependent challenges:

- Maintaining and expanding affordable, secure energy supplies to meet growing consumer demand.
- Addressing the social and ecological risks posed by rising greenhouse gas emissions and climate change.

Managing greenhouse gas emissions and meeting growing energy demand requires action by individuals, companies, and governments. Making genuine progress requires an integrated set of solutions. This includes increasing energy efficiency, advancing lower carbon energy technologies, and supporting effective national and international policies.

Reliable and competitively priced energy underpins economic growth and stability, and is crucial to raising living standards in both developing and advanced nations. Therefore, policies aimed at reducing greenhouse gas emissions must do so at the lowest possible cost.

² IPCC (2014), Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland (available at www.ipcc.ch).

³ UNFCCC (2015), Adoption of the Paris Agreement, 12 December (available at unfccc.int/resource/docs/2015/cop21/eng/09r01.pdf).



Natural gas: integral to a low-carbon economy

Natural gas is a lower-carbon form of energy suitable for electricity generation, industry and households.

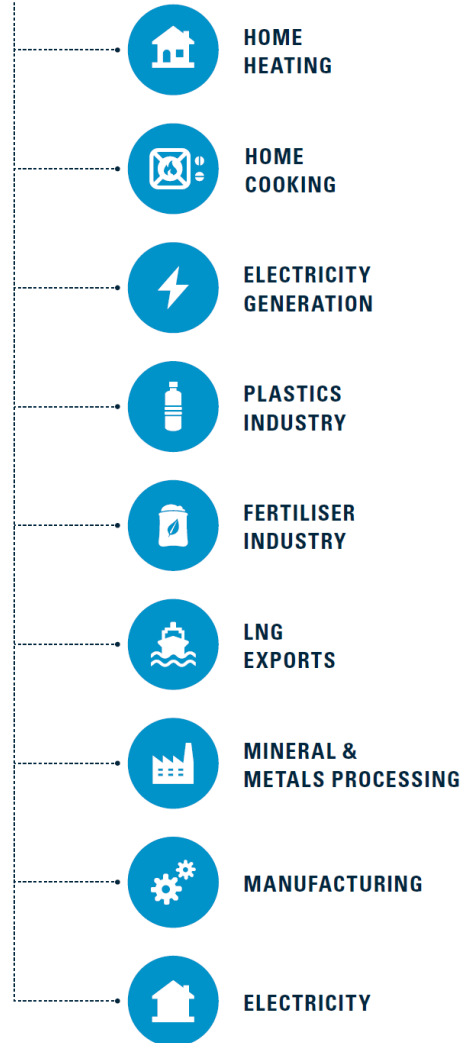
Increasing its use can deliver immediate and substantial carbon savings. Simply switching from coal to natural gas can reduce greenhouse gas emissions by 40-50% and by as much as 75% in some circumstances.⁴

Australia's gas industry, domestically and through our exports of liquefied natural gas (LNG), contributes substantially to the economic development of the nation and reduces global greenhouse gas emissions.

Natural gas is a highly flexible fuel:

- Natural gas is commonly used to generate electricity, heat and steam for industries, including alumina refining, food and beverage manufacturing, and grocery production.
- Natural gas is ideally suited as a complement to renewable electricity generation because gas generation plants can be rapidly turned on and off to respond to changes in intermittent generation from renewable sources.
- Natural gas is the fuel of choice in co-generation and tri-generation. These technologies can provide electricity, heating and cooling at very high thermal efficiencies approaching 80%.⁵
- Compressed natural gas and LNG are used in the transport sector, and this use can be expanded.
- Innovative technologies, such as natural gas fuel cells, have been developed that can provide electricity and heat requirements in applications ranging from a small house to a medium sized office or factory. These technologies can deliver thermal efficiencies as high as 85%.⁶
- Natural gas is also a critical feedstock for industry that often cannot be substituted in producing fertilisers, cleaners, polymers and refrigerants.

NATURAL GAS



⁴ Australian Council of Learned Academies (2013), Engineering Energy: Unconventional Gas Production, June (available at www.acola.org.au/index.php/projects/securing-australia-s-future/project-6). While the emissions benefit is lower when compared to ultra supercritical coal fired power generation, as the Council has noted "gas-fired electricity generation will generally replace existing coal-fired boilers that are less efficient subcritical facilities".

⁵ These technologies are already being deployed in commercial buildings in Australia (see www.urbanenergy.com.au/projects, www.originenergy.com.au/files/Origin_Coca_Cola_place_FactSheet.pdf, www.cityofsydney.nsw.gov.au/vision/towards-2030/sustainability/carbon-reduction/trigeneration and www.qantas.com.au/travel/airlines/electricity/global/en#power for examples).

⁶ Recently there have been significant advances in ceramic fuel cells that run on natural gas, with a range of commercial available products now on the market.



Reducing emissions

The Australian Council of Learned Academies has found using gas to provide more baseload and peak electrical power generation in Australia – in scenarios of higher use of both renewables and gas – would deliver substantial emissions reductions.

This would reduce the Australian electricity generation sector's emissions by between 54 Mtpa-103 Mtpa CO₂-e (million tonnes per annum, carbon dioxide equivalent) by 2030 – a reduction of 27% to 52% from the base case of 197 Mtpa CO₂-e in 2012.

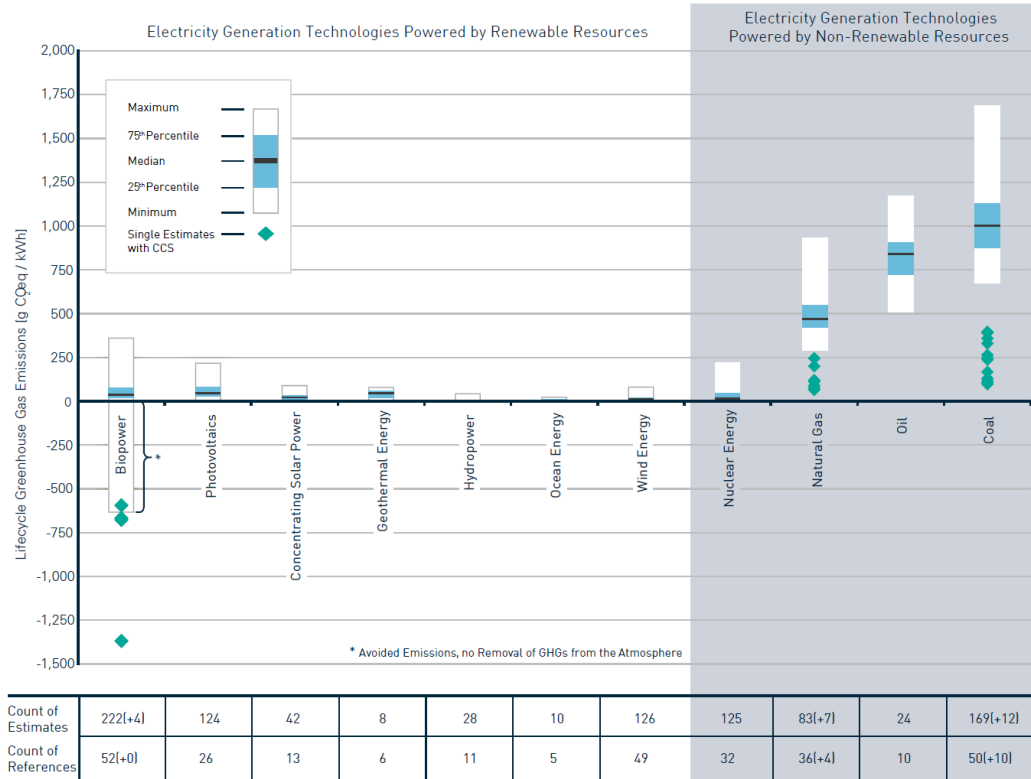
Other environmental benefits

Fuel switching would also have other benefits. Natural gas plants use much less water than coal-fired power and produce much lower levels of noxious substances such as sulphur dioxide, nitrogen oxides and fine particle emissions.

Burning gas instead of coal improves urban air quality. This is particularly important in many Asian countries that are importing Australian LNG or considering imports.

Baseload power is the level of generation needed to meet forecast minimum demands. Baseload power plants must run constantly and at predictable levels. Peaking power is power that can be brought online quickly in periods of peak demand. Intermittent power is any source of energy (such as solar and wind) that is not continuously available.

The range of life cycle emissions for electricity generation (tonne CO₂-e/MWh) from a range of energy sources



7 IPCC (2011), Summary for Policymakers. In: IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlomer, C. von Stechow (eds)], Cambridge University Press, Cambridge, UK and New York, NY, USA (available at srren.ipcc-wg3.de/report/IPCC_SRREN_SPM.pdf).



Australia has substantial natural gas resources. Natural gas offers a relatively low-cost emissions abatement opportunity. This means developing these resources can provide significant national environmental, economic and social benefits.



The Moomba gas plant in South Australia.

Carbon capture and storage (CCS)

Greenhouse gas storage is seen as one of the pathways to the continued use of fossil fuels in a low-carbon economy.

The global oil and gas industry is leading the world in the practical deployment of this technology. Norway's Statoil has developed large carbon capture and storage (CCS) projects at Sleipner and Snøhvit. In Canada, Shell has developed the Quest CCS project.

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 has continued through the CO2CRC Limited).

Since that time, several hundred million dollars has been invested in assessing large greenhouse storage projects.

The Gorgon Carbon Dioxide Injection Project⁸ – soon to be commissioned – is the world's largest greenhouse gas mitigation project undertaken by industry.

⁸ See www.chevronaustralia.com/our-businesses/gorgon/carbon-dioxide-injection for more information.



APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions at least cost and facilitates broad-based investment decisions consistent with there being an international price on carbon.

APPEA climate change policy: key points

1. International engagement is crucial.
2. Climate change and energy policies must be integrated and harmonised.
3. Climate change adaptation strategies are necessary.
4. Climate policy must not compromise national or global economic development or energy security.

APPEA and its members will continue to work with all of Australia's governments to:

- Support a national climate change policy response consistent with the policy principles outlined in this paper.
- Expand the use of natural gas in the domestic economy, with consequent reduction in the emissions intensity of the Australian economy, for example, in electricity generation and resource processing.
- Promote development of lower emissions technologies, such as high-efficiency electricity generation and greenhouse gas storage.
- Make Australia more attractive as an investment destination for LNG projects, so that Australian LNG can help Australia's trading partners reduce their greenhouse gas emissions, thereby contributing to a potential significant reduction in global emissions when compared to the use of higher-emitting fuels.

About APPEA

The Australian Petroleum Production & Exploration Association is the peak national body representing Australia's oil and gas exploration and production industry. APPEA has about 80 full member companies. These are oil and gas explorers and producers active in Australia. APPEA members account for an estimated 98 per cent of the nation's petroleum production. APPEA also represents more than 230 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 industry and community. APPEA aims to secure regulatory and commercial conditions that enable member companies to operate safely, sustainably, and profitably. The Association also seeks to increase community and government understanding of the upstream petroleum industry by publishing information about the sector's activities and economic importance to the nation.

www.appea.com.au