Australia's cleaner energy future

Incorporating the third edition of the APPEA Climate Change Policy Principles

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Introduction

The Australian oil and gas industry has a key role to play in a cleaner energy future, both in Australia and globally.

APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions, consistent with the objectives of the Paris Agreement, and applies a broad-based price signal on emissions to facilitate broad-based investment decisions at the lowest cost to the economy.

Australia's goal should be an approach to climate policy that is national, consistent with the objectives of the Paris Agreement and which supports the environmental objectives and industries that provide jobs and economic growth. These are not competing goals but need to be aligned if outcomes are to be sustainable.

Climate change policy should work cohesively with other policies—including energy, international trade, taxation, economic growth, population, and environmental and social responsibility.

Policies should achieve emissions reductions consistent with net zero emissions across the Australian economy by 2050 as part of a contribution to a goal of global net zero emissions by 2050.

The *APPEA Climate Change Policy Principles* set out below are designed to assist policymakers in developing efficient and effective responses to deal with climate change.

This document is a companion to the *Industry Action on Emissions Reduction* report, which provides an overview and case studies of some of the activities and initiatives undertaken by the oil and gas industry to reduce its greenhouse gas emissions.[1]

APPEA's position on climate change

APPEA supports the science of climate change and the need to reduce global emissions, consistent with the objectives of the Paris Agreement. This will require action by individuals, companies, and governments.

Societies around the world continue to strive towards two major and interdependent objectives:

- Meeting greenhouse gas emissions reduction commitments to reduce the environmental, economic and social risks posed by rising greenhouse gas emissions and climate change.
- Maintaining and expanding affordable, secure energy supplies to meet growing consumer demand for energy as populations and living standards grow.

Working together to meet the global challenge

The central aim of the Paris Agreement,[2] which entered into force in 2016, is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. The agreement also aims to achieve net zero greenhouse gas emissions globally in the second half of this century.[3]

More recently, the Intergovernmental Panel on Climate Change (IPCC)[4] found that limiting global warming to 1.5°C above pre-industrial levels would require changes on an unprecedented scale, including:

- deep emissions cuts across all sectors
- a range of technologies
- behavioural changes
- increased investment in low carbon options.

The IPCC also found these changes would have benefits to people and natural ecosystems.

Making genuine progress requires an integrated set of solutions. This includes actions by industry to reduce emissions, provide and advance lower carbon energy technologies, and support effective national and international policies.

COVER IMAGE COURTESY OF WOODSIDE

Policy principles

1 Net zero emissions by 2050 should be the goal of national and international policy

The objectives of the Paris Agreement are to keep a global temperature rise this century to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. Policies should be consistent with and support these objectives.

Policies should achieve emissions reductions consistent to achieve net zero emissions across the Australian economy by 2050 as part of a contribution to a goal of global net zero emissions by 2050.[5] The Australian Government has the responsibility to set interim targets and for the policy framework that meets them.

Australia should continue to engage the international community to pursue environmentally effective and economically efficient climate change policies.[6] An international policy framework should:

- promote international participation
- minimise the costs and distribute the international burden equitably
- ensure the task of reducing emissions is inclusive of all sectors and countries
- allow for the unrestricted flow of credible emissions units between international jurisdictions
- be underpinned by transparent reporting arrangements.

2 Climate policies should be efficient, enduring and integrated with economic, social, technology and energy policies

Australia's policy response should seek to:

- Set clear, long-term targets for emissions reduction that are consistent with the objectives of the Paris Agreement and provide predictability to industry to support planning and future investment.
- Deliver low cost greenhouse gas emissions abatement through an appropriately designed price mechanism that provides an economy-wide transparent 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 and avoid penalising early movers who have previously implemented abatement measures.
- Support the development and deployment of pre-commercial/new and emerging low-emissions technologies.
- Support climate adaptation efforts, including through international and national modelling to provide location-specific climate change forecasts and impacts, risk-management strategies to reflect likely impacts of climate variability and protect people and critical infrastructure from the negative impacts of climate change.

In delivering this policy response, the Australian Government and the state/territory governments have separate and distinct roles. The Australian Government should set the Nationally Determined Contributions (NDCs). States and regulators should support delivery of the nationally set target and avoid any overlap or duplication.

> Australia should continue to engage with the international community to pursue environmentally effective and economically efficient climate change policies

3 Australia's international competitiveness should be enhanced

The Australian Government should pursue climate policies that maximise growth in jobs and investment. 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.

As part of its international engagement, Australia should:

- Continue to pursue economically efficient climate change policies, including the development of international accounting of greenhouse gases and offset markets, e.g. through Article 6 of the Paris Agreement.
- Support the use of its gas resources to assist in the decarbonisation pathways of other countries by promoting its LNG export sector in trade negotiations.

4 Universal access to affordable, reliable, sustainable and modern energy must be achieved

Australia's policy response should recognise:

- UN Sustainable Development Goal 7[7] to ensure universal access to affordable, reliable, sustainable and modern energy—noting that increasing global population and urbanisation are generating 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 as we continue to move towards a low-carbon economy.

Commitment to action

The Australian upstream oil and gas industry has a long history of engagement in the discussion around the most effective and efficient policy measures to reduce global greenhouse gas emissions.

APPEA's role in that process is to provide a forum where member companies can engage and share information on the initiatives each company is undertaking to generate greater collaboration and action across the industry. While there are some common approaches amongst many APPEA members, individual members are free to pursue initiatives that best meet the needs of their business and its investors and stakeholders.

The APPEA website (www.appea.com.au) provides up-to-date information on individual member initiatives. Reference should also be made to the individual APPEA member company websites.

> The Australian oil and gas industry has committed to practical actions and initiatives to reduce its greenhouse gas emissions. These actions encompass the entire oil and gas exploration and production life cycle

Natural gas:

Integral to a low-carbon economy

Australia generates significant national economic, environmental and social benefits through the use of its substantial natural gas resources.

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

Increasing its use can deliver immediate and substantial emissions savings. With structural changes underway in the power generation sector and growth in renewable energy technologies, natural gas is the perfect partner to intermittent renewable energy that requires 'on-call' electricity generation to manage falls in renewable output or peaks in demand. As more renewable energy is integrated into the grid, this balancing role becomes more critical.[8]

Natural gas is a highly flexible fuel with a diverse range of uses:

- Natural gas is commonly used to generate electricity, heat and steam for industries, including alumina refining and food and beverage manufacturing.[9]
- Natural gas is also a critical feedstock for industry that often cannot be substituted in producing fertilisers, cleaners, polymers and refrigerants.
- 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.[10]
- Natural gas is the fuel of choice for technologies that can provide a combined system electricity, heating and cooling at very high thermal efficiencies approaching 80 per cent.[11]
- 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 per cent.[12]
- 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 (such as carbon capture and storage) to offer a carbon-neutral product.[13]
- Demand for energy as part of the industrialisation of Asian economies and properties of natural gas as a lower emitting and cleaner burning fuel is driving sustained international demand for Australia's LNG exports.

Natural gas:

A key part of a cleaner energy future in Australia and in the Asia–Pacific

The role of natural gas in a cleaner energy future in Australia

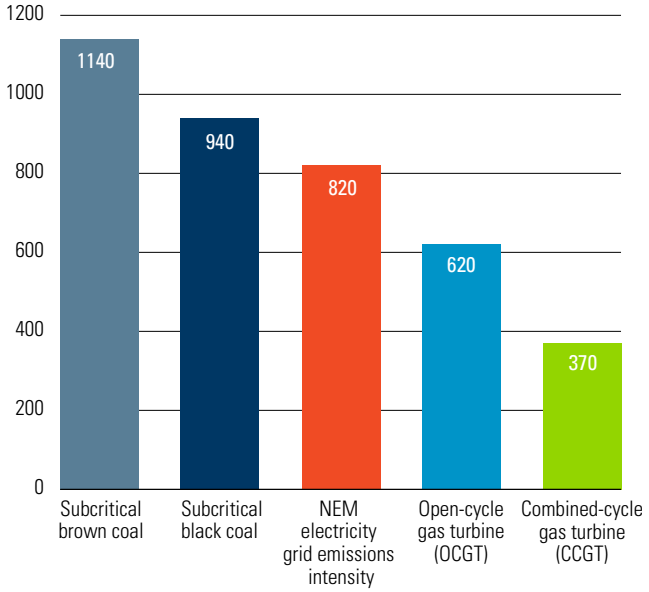
Using more natural gas in Australia's power generation and resource processing could significantly enhance the nation's ability to meet increasing energy needs and reduce emissions. These outcomes are possible because available natural gas power generation technologies can reduce greenhouse gas emissions compared to the average across the National Electricity Market and by even more compared to traditional power generation technologies.[14]

In addition, 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.

Natural gas-fired generation also has the advantage of providing long-duration energy firming. As the electricity market evolves, a portfolio of energy storage and firming options will be required which will likely include natural gas-fired generation, hydro and batteries.

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.

Estimated operating emissions for new coal and gas-fired power stations (kg CO_2-e/MWh)



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

The role of natural gas in a cleaner energy future in the Asia–Pacific

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.

There are three key drivers for international LNG demand:[15]

- Increasing energy needs as nations develop.
- Emissions and air quality challenges from the alternative energy sources currently available to meet that demand.
- The need for energy security.

The use of Australian LNG by our key trading partners can help improve air quality, reduce greenhouse gas emissions and improve energy security.

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 report[16] analyses whole-of-lifecycle greenhouse gas emissions, including extraction, transportation and usage of natural gas in Queensland's Surat Basin.

This is the first time estimates of lifecycle greenhouse gas emissions associated with an operating Queensland LNG project in Australia have been used—and provides data about the benefits of natural gas for electricity generation. 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. Its findings show a reduction in emissions of up to 50 per cent when the full lifecycle of greenhouse gas emissions from all parts of the supply chain is incorporated.

The report found:

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

A similar lifecycle analysis was performed by Environmental Resource Management (ERM),[17] and peer reviewed by CSIRO, and shows the development of the Browse and Scarborough projects could avoid 650 million tonnes of CO_2-e in greenhouse gas emissions between 2026 and 2040 by replacing higher emission fuels in countries that import Australian gas.

The report found:

> *… increasing natural gas contributes to lower greenhouse gas (GHG) emissions when it replaces the burning of coal and oil for power generation, as well as combustion for heat. In Europe, the USA and China, increasing consumption of natural gas has substantially contributed to lower GHG emissions …*

The role of technology
in reducing greenhouse gas emissions

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 Australian oil and gas industry has its own emissions reduction journey. The industry also works both in Australia and around the world directly and in partnership with others to accelerate the development of low emissions technologies with the potential to deliver step-change emissions reductions from the processing and use of our products over a longer time horizon.

Two examples as part of this broader range of technologies and emissions reduction activities and initiatives[18] include carbon capture and storage and hydrogen.

The role of carbon capture and storage (CCS) in a cleaner energy future

CCS is already well established as a safe, large-scale permanent greenhouse gas emissions abatement solution and is seen in several scenarios, like some IPCC scenarios, essential to achieve global climate goals. In those scenarios, acceleration of CCS deployment to reach capacity of more than two billion tonnes per annum by 2040 is essential.[19]

Australia has a natural competitive advantage to implement CCS with known high quality, stable geological storage basins, existing infrastructure, world-class technical expertise and regulatory regimes (environment protection, carbon accounting and reporting, financial services).[20]

Australia needs low cost carbon abatement to maintain its position as a leading energy exporter and ensure international competitiveness in a lower-carbon future. With scale and experience, the cost of CCS will decrease, creating the potential to deliver competitive, large-scale abatement for existing industries and new industries such as hydrogen and ammonia.

Just as LNG exports are playing an important role in reducing global emissions, CCS in Australia can play an important role in securing the future of Australia's oil and gas industry in a cleaner energy future.

Natural gas is a pathway to a large-scale and innovative commercial hydrogen industry

An Australian hydrogen industry and a local market could generate significant opportunities for the country. Australia's upstream oil and gas industry is well placed to assist in the development in one of the pathways[21] to a large-scale and innovative commercial hydrogen industry. This is both in using natural gas to produce hydrogen and using gas infrastructure to process and transport hydrogen.

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

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

The Australian oil and gas industry has a key role to play in a cleaner energy future, both in Australia and globally

APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions, consistent with the objectives of the Paris Agreement, and applies a broad-based price signal on emissions to facilitate broad-based investment decisions at lowest cost to the economy.

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.
- Promote development of lower emissions technologies, such as carbon capture and storage and hydrogen.
- 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 60 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 about 140 associate member companies that provide a wide range of goods and services to the upstream oil and gas industry.

APPEA works with Australian governments to help promote the development of the nation's oil and gas resources in a manner that maximises the return to the Australian 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. APPEA also hosts conferences each year to exchange ideas and contribute to the development of the industry's policy positions.

Vision APPEA's vision is 'Energy for a Better Australia'.

Purpose To be the effective voice of the oil and gas industry on the issues that matter, working collaboratively with industry and the community.

Endnotes

1 For more information and for a copy of the *Industry Action on Emissions Reduction* report, see www.appea.com.au.

2 UNFCC (2016), The Paris Agreement (available at unfccc.int). Australian ratified the Paris Agreement in November 2016.

3 Article 4.1 of the Paris Agreement states '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, recognising 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, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.'

4 IPCC (2018), *Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*, IPCC, Geneva, Switzerland (available at www.ipcc.ch).

5 A number of APPEA members have set net zero emissions targets.

6 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).

7 See sdgs.un.org for more information on the United Nations Sustainable Development Goals (SDGs) and for more information on SDG7 (Ensure access to affordable, reliable, sustainable and modern energy for all).

8 Natural gas-fired generation also has the advantage of providing long-duration energy firming. As the electricity market evolves, a portfolio of energy storage and firming options will be required which will include natural gas-fired generation, hydropower and batteries.

9 See also *Natural Gas: Essential for Australian Manufacturing* at www.appea.com.au.

10 See for example, Dr Alan Finkel, Australia's Chief Scientist, National Press Club Address, 12 February 2020 (available at www.chiefscientist.gov.au).

11 These technologies are already being deployed in commercial buildings in Australia (see cogentenergy.com.au and www.qantas.com.au for examples).

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

13 See www.energyinformationaustralia.com.au for more.

14 Commonwealth of Australia (2017), *Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future*, June, page 203 (available at www.energy.gov.au). Data from the report shows natural gas power generation technologies can reduce emissions by 68 per cent compared to current brown coal generation technologies and by 61 per cent compared to current black coal generation technologies.

15 For example, the International Energy Agency's *World Energy Outlook* has found the use of natural gas is expected to grow consistently over the outlook period (to 2040) under all scenarios. See www.iea.org for more information.

16 See CSIRO Energy (2019), *Whole of Life Greenhouse Gas Emissions Assessment of a Coal Seam Gas to Liquefied Natural Gas Project in the Surat Basin, Queensland, Australia* Final Report for GISERA Project G2 (report authors Heinz Schandl, Tim Baynes, Nawshad Haque, Damian Barrett and Arne Geschke), July (available at gisera.csiro.au).

17 See ERM (2020), Comparative Life Cycle Assessment: Browse and Scarborough (report authors Paul McConnell, Tim Grant) April (available at www.erm.com).

18 See APPEA (2020), *Industry Action on Emissions Reduction*, for more information. The report highlights through a series of case studies the range of the practical actions and initiatives undertaken by the oil and gas industry to reduce its greenhouse gas emissions. These actions encompass the entire oil and gas exploration and production lifecycle (see www.appea.com.au).

19 For further information, see www.globalccsinstitute.com.

20 Australia is already home to the largest commercial CCS project in the world, the Gorgon Carbon Dioxide Injection Project, located in northern Western Australia. The injection project is expected to capture between 3.4 and 4 million tonnes of CO_2-e per annum. It is expected to store more than 100 million tonnes over the life of the project. See australia.chevron.com for more information.

21 Alongside hydrogen production from renewable energy sources, where Australia also has significant opportunities.

Head Office, Canberra
Level 1
60 Marcus Clarke Street
Canberra ACT 2601
GPO Box 2201
Canberra ACT 2601
Phone: 02 6247 0960
appea@appea.com.au

Brisbane
Level 3
348 Edward Street
Brisbane QLD 4000
PO Box 12052
George Street QLD 4003
brisbane@appea.com.au

Perth
Level 10
190 St George's Terrace
Perth WA 6000
PO Box 7039 Cloisters Square
WA 6850
perth@appea.com.au

Melbourne
Suite 1, Level 10
34 Queen Street
Melbourne VIC 3000
melbourne@appea.com.au

appea

www.appea.com.au