appea the voice of australia's oil and gas industry

Submission
March 2015

Special Review: Australia's emissions reduction targets

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INTRODUCTION

Since 1959, the Australian Petroleum Production & Exploration Association (APPEA) has been the peak national body representing the upstream oil and gas exploration and production industry. APPEA has more than 80 member companies that explore for and produce Australia's oil and gas. In addition, APPEA's more than 250 associate member companies provide a wide range of goods and services to industry. 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 welcomes the opportunity to provide comment on the Climate Change Authority's review into Australia's emissions reduction targets (the review). This submission follows on from and updates our December 2013 submission to the Authority's *Australia's Greenhouse Gas Emissions – Targets and Progress Review Draft Report: October 2013* (the *Draft Report*).

APPEA is committed to working with policy makers as they develop policy responses to climate change. With that in mind, APPEA has developed the *Climate Change Policy Principles* document – a copy of which is at Attachment 1[1] – setting out the principles that APPEA considers should underpin Australia's response to climate change.

Most importantly, APPEA supports a national climate change policy that delivers abatement at least cost.

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 development[2]. APPEA has contributed to the AIGN submission to the review.

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

APPEA's submission addresses specific aspects of the review, 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's review within the context of the current state and potential future contribution of the upstream oil and gas industry to the Australian economy and to the welfare of all Australians.

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

[1] A copy of APPEA's *Climate Change Policy Principles* can also be found at www.appea.com.au/industry-in-depth/policy/greenhouse.
[2] See www.aign.net.au for further information.

Australia has vast resources. Geoscience Australia[3] recently estimated that Australia's total gas resources are currently around 819 trillion cubic feet (tcf) or 900,500 petajoules (PJ). By way of comparison, Australia's production of natural gas in 2013-14 (including exports) was around 2 tcf or 2,200PJ, meaning Australia has more than enough gas to service both domestic and export markets for decades.

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.

Just as importantly, the industry creates significant wealth for the country, including through the employment of many Australians, underpinning the revenue collections of governments and generating valuable export revenue for the Australian economy. Almost $180 billion is currently being invested in oil and gas projects including six major liquefied natural gas (LNG) export projects that will add to the four LNG projects under operation[4].

Australia's oil and gas industry has underpinned much of Australia's economic prosperity and growth since at least the early 1960s. A recent PwC report, *Value Adding: Australian Oil and Gas Industry*[5], shows that:

- The oil and gas industry's production profile directly represents around 2 per cent of current GDP, with value-added of approximately $32 billion in 2012-13.
- At current projected investment levels, the total forward contribution of the combined oil and gas and exploration sectors is projected to double to approximately $53 billion in 2019-20 and $67 billion in 2029-30.
- Driving strong value-add from the industry is an increase in gas exports over the next decade. The value of natural gas exports (already Australia's third largest export, after iron ore and coal) is expected to reach around $60-70 billion by the middle of 2019 and production is expected to double over the next five years.
- In 2030, when production (on the basis of current and forthcoming capacity) and prices are expected to stabilise, the oil and gas industry's total economic contribution is projected to be around 2.6 per cent of the Australian economy.
- After accounting for its inter-linkages with the rest of the economy (companies all over Australia are supply goods and services to the oil and gas industry, and the use of fly-in, fly-out staffing is spreading the benefits of the industry) the sector is projected to be around 3.5 per cent of national output.

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[3] Geoscience Australia, Department of Industry and Bureau of Resources and Energy Economics (2014), *Australian Energy Resource Assessment: Second Edition*, page 97 *(*available at www.ga.gov.au/metadata-gateway/metadata/record/gcat_fa6d674d-ecbb-6629-e044-00144fdd4fa6/Australian+Energy+Resource+Assessment+-+Second+Edition).

[4] See Department of Industry (Office of the Chief Economist) (2014), *Resources and Energy Major Projects*, for a listing of upstream oil and gas projects at the Publicly Announced Stage, Feasibility Stage, Committed Stage and Completed Stage (available at www.industry.gov.au/industry/Office-of-the-Chief-Economist/Publications/Pages/Resources-and-energy-major-projects.aspx).

[5] PwC (2014), *Value-adding: Australian Oil and Gas Industry, September 2014,* pages 28-29 (available at www.appea.com.au/wp-content/uploads/2014/11/PwC-Report-Oil-and-Gas-Industry-Sept-2014-FINAL.pdf).

Figure 1: Australian LNG projects: by liquefaction status

Source: Department of Industry (2014).

By 2020, the sector's economic contribution to the national economy will more than double to $65 billion and taxation paid will rise from $8.8 billion in 2012 ($4.9 billion in corporate taxes and $3.8 billion in production taxes) to reach almost $13 billion.

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

COMMENTS ON SPECIFIC ISSUES RELEVANT TO THE REVIEW

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 risks faced as a result of climate change. The key role natural gas plays in reducing global greenhouse gas emissions is considered in more detail at Attachment 2.

EMISSIONS REDUCTION GOALS FOR AUSTRALIA

The Authority's 2014 *Targets and Progress Review Final Report* (the 2014 *Final Report*) asserts that Australia should aim to achieve more than the current unconditional 2020 target of a 5 per cent reduction in emissions. The Authority recommended a minimum 2020 target of 15 per cent below 2000 levels (and using Australia's carryover under the Kyoto Protocol to raise the 2020 target by 4 percentage points, giving an effective target of 19 per cent) and a trajectory range for emissions reductions of between 40 and 60 per cent below 2000 levels by 2030.

APPEA notes the Australian Government has made no such commitment, but has committed to the existing target of a 5 per cent reduction on 2000 levels with commitments beyond 2020 to be announced later in 2015.

In setting Australia's emission reduction goals, 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.

As a resource rich export focussed economy, Australia has a relatively emissions-intensive resource endowment and comparative advantage that is largely based on our ability to develop this extensive resource base. Combined with Australia's relatively small and widely dispersed population base, it is little surprise that Australia has, for example, a relatively high level of per capita emissions.

Climate change is a global issue. It is the relevant level of absolute concentration of greenhouse gases in the atmosphere that matters to global climate outcomes. Therefore, it is inappropriate for the Authority to focus, as it did in preparing its 2014 *Final Report*, on per capita emissions levels as a comparator for Australia's emissions level.

APPEA continues oppose the reliance the Authority has previously placed on per capita emission levels in assessing Australia's emissions and emission reduction goals. In this review, the Authority should instead focus on using a more appropriate measure of Australia's emissions levels – absolute emissions levels, emissions as a proportion of GDP or similar. These issues are considered further on pages 9-10.

INTERNATIONAL ACTION: THE ACTION OF TRADE COMPETITORS A KEY AREA OF FOCUS

As noted above, Australia should with 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 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 2014 *Final Report* paid inadequate attention to this issue, choosing to focus instead on "major emitters" and "trading partners". While important, major emitters and trading partners are only part of the story, with the actions of trade competitors forming the key issue for LNG exporters. This shortcoming should be rectified in the current review.

The growth in LNG demand has been driven by the economic and industrial transformation of key economies in the Asia-Pacific 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 including the most basic indicator of policy action – whether the country has made a pledge under the Cancun Agreements[6] – and data from the *BP Statistical Review of World Energy, June 2014*[7]. Table 1 includes the United States, which is a potential future competitor, given the export potential of development of its enormous shale gas resources.

[6] See cancun.unfccc.int/mitigation for further information.
[7] See www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy.html for further information.

Table 1: LNG Exports

Country	LNG exports (bcm)	LNG exports (%)	Cancun Agreement pledge
US	0.1	0.0	Yes
Trinidad & Tobago	19.8	6.1	No
Peru	5.6	1.7	Yes
Norway	3.8	1.2	Yes
Other Europe	5.1	1.6	Yes
Russian Federation	14.2	4.4	Yes
Oman	11.5	3.6	No
Qatar	105.6	32.5	No
United Arab Emirates	7.4	2.3	No
Yemen	9.6	3.0	No
Algeria	14.9	4.6	No
Angola	0.4	0.1	No
Egypt	3.7	1.1	No
Equatorial Guinea	5.1	1.6	No
Nigeria	22.4	6.9	No
Brunei	9.5	2.9	No
Indonesia	22.4	6.9	Yes
Malaysia	33.8	10.4	No
Australia	**30.2**	**9.5**	**Yes**

Source: UNFCCC (2013); BP (2014).

Table 1 shows that of the 19 countries/regions listed, 12 have not made pledges under Cancun Agreements. Those 12 countries accounted for over 75 per cent of global LNG exports in 2012. This includes Qatar, one of Australia's major LNG competitors and the world's largest exporter of LNG (with over 32 per cent of global exports).

Of the remaining seven countries, only Indonesia and Russia (and potentially the United States) could be regarded as directly competing with Australia for LNG market share in the Asia-Pacific. In reality, greenhouse policy initiatives that do apply in practice in Indonesia and Russia are unlikely to have a material impact on their LNG industries.

Future competition (along with that from the US) is likely to come from PNG and East Africa – neither of which could 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. Indeed, none have policies in place that impose an "effective" carbon price on their LNG exporters. Further, the prospect of our competitors taking meaningful action in the foreseeable future is 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 exporters (or, in countries like China, 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.

The upstream oil and gas industry is currently investing around $180 billion in oil and gas projects under construction. These projects will have an enormous positive influence on economic activity in Australia and represent some of the biggest projects ever undertaken in Australia.

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.

The Authority's current review, in contrast to its 2014 *Targets and Progress Review Final Report*, needs to better recognise that the situation facing many individual trade-exposed industries differs from broad economy-wide aggregate comparisons:

- It is the competitive position facing individual industries; not just broad action or intention to act at the economy-wide level that counts.
- The actions of key competitor countries are key; not just the actions of so-called "major economies/emitters" or "trading partners".

ECONOMIC IMPLICATIONS OF AUSTRALIA'S EMISSIONS REDUCTION GOALS

While the 2014 *Final Report* provided discussion and economic modeling to support its recommendations to move beyond Australia's existing emission reduction goal, the2014 *Final Report's* focus on per capita emissions and a 'contraction and convergence' approach to examine whether Australia should move beyond its existing emissions reduction goal does not provide an appropriate basis to assess the economic and social implications of its recommendations.

The level of economic 'effort' required to meet Australia's commitments and how that level of effort/commitment compares to other countries (comparable effort) is critical. It is difficult to determine, on face value, the level of emissions reduction effort involved in meeting these climate change commitments. Much depends on the particular economic structure of countries and the choice of a historical base year in which to measure future emissions reduction.

A useful means of assessing comparable effort, and one that should be examined in the current review, can be made from examining how a country's commitments diverge from its 'no commitment' emissions baseline, adjusting for chosen base years and whether targets are prescribed as a reduction in absolute emissions or the emissions intensity of Gross Domestic Product (GDP).

A report by Deloitte Access Economics (DAE)[8], *The Clean Energy Future: Cancun commitments and comparable effort*, commissioned by AIGN and the Business Council of Australia (BCA), and published in December 2011, shows that such a comparison of lower bound abatement pledges shows that Australia shoulders its fair share of emissions reduction. Australia's 5 per cent unconditional commitment implies a 40 per cent reduction in net emissions from a 'no pledge' baseline. This commitment is comparable with key economies such as Japan, the European Union, North America and China.

[8] See www.aign.net.au/file_download/967/CEF+-+Cancun+and+comparable+effort.pdf and www.aign.net.au/publications/australian-international-negotiations for further information. This report stands alongside similar previous studies undertaken by Access Economics for AIGN, *Road to Copenhagen: Negotiating Australia's 'comparable effort'* and *Road to Copenhagen: Economic 'comparable effort' modelling of Australia's national allocation*. Both are available at www.aign.net.au/publications/reports.

Importantly, however, DAE finds the economic impact of Australia's current abatement commitment is far more significant than these other economies, reflecting Australia's generally higher cost domestic abatement opportunities (and therefore higher marginal abatement costs).

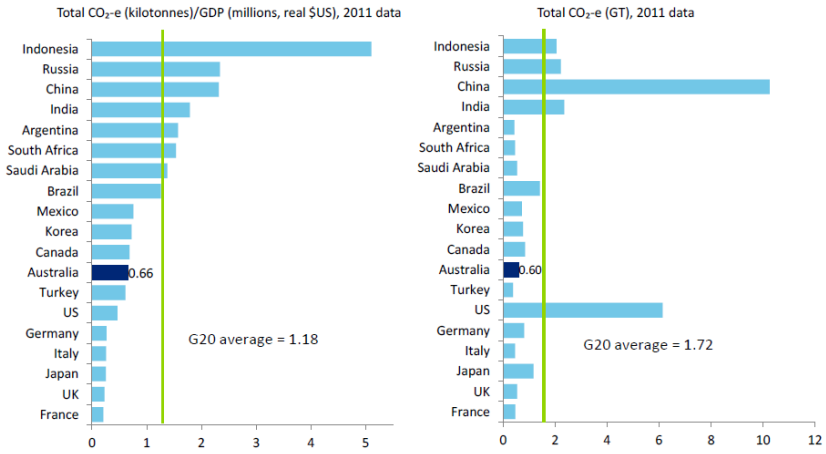
Analysis of these impacts indicates that Australia's 5 per cent commitment leads to a loss in Gross National Income (GNI), a comprehensive indicator of economic welfare, of around 2 and 2½ times the global average at 2020 with trading and without trading respectively. Estimated impact on GNI is able to incorporate many different national circumstances of each country, including population, population growth, economic structure, economic growth, resource endowment and abatement opportunities.

In a similar way, a November 2014 report[9] by Deloitte Access Economics (DAE), *Emissions metrics – Australia's carbon footprint in the G20*, found that the popular measure of carbon emissions per capita fails to simply communicate the ongoing need to grow economic prosperity and improve world living standards. A better measure is carbon emissions per unit of production (expressed as GDP).

The DAE report shows that Australia's performance as measured in carbon emissions per unit of GDP is better than the average of the Group of 20 (G20) nations (which together are responsible for 76 per cent of global carbon emissions and 85 per cent of global GDP). Over time, Australia's emissions intensity has reduced, and at a faster rate than the G20 average.

Figure 2, taken from the DAE report, shows Australia's total equivalent carbon emissions (kilotonnes) per million dollars of GDP and total emissions. It shows Australia's emissions are below the average of the G20 countries and are similar to Canada. This result differs markedly from per capita emissions, in which Australia is often shown to have the highest level of emissions per capita.

Figure 2: Total kilotonnes of equivalent carbon emissions per million dollars of GDP (real $US) and total emissions (Gigatonnes (GT)) – where Australia sits in the G20



Source: Source: World Resources Institute data, IEA data, Deloitte analysis
Note: Includes emissions from land use and land use change and forestry

[9] Deloitte Access Economics (2014), *Emissions metrics – Australia's carbon footprint in the G20*, 12 November (available at www.originenergy.com.au/news/files/Emissions_Metrics_Australias_carbon_footprint_in_the_G20.pdf).

APPEA recommends the review provide a more complete analysis than did the 2014 *Targets and Progress Review Final Report* of the implications of the existing target for Australia's economic and social conditions. Such an analysis will show that many other advanced countries have to significantly increase their pledges if a future international agreement is to reflect a fair distribution of comparable effort from Australia's point of view.

APPEA also notes that one of the key ways the costs of meeting emissions reduction targets can be kept low is to allow access to all bona fide permits, including international permits. This is consistent with APPEA's *Climate Change Policy Principles*, which advocates that any national approach to regulating greenhouse gas emissions should recognise the widest possible range of credible offsets. This would include those sourced overseas.

AUSTRALIA'S EMISSIONS OUTLOOK

As the 2014 *Final Report* found, the level of future covered and uncovered emissions is uncertain. It is the case however, as noted in various sections of the 2014 *Final Report*, that Australia's LNG industry will in coming years see its contribution to Australia's emissions profile increase.

However, in considering Australia's emission reduction targets and indeed Australia's 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 reduce greenhouse gas emissions. Australia's vast 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.

The 2014 *Final Report* on page 146 claims:

> *Even with incentives to reduce emissions, growth in export-oriented activity, such as liquefied natural gas (LNG) production and agriculture, is projected to increase emissions in those areas.* [EMPHASIS ADDED]

The statement does not accurately reflect the full range of drivers of demand for LNG. While the demand for energy as part of the industrialisation of key Asian economies is a key driver, the cleaner properties of natural gas as a lower emitting and cleaner burning fuel is also driving much of the foreign demand for LNG.

This should be recognised in the current review. Action on climate change is entirely consistent with strong demand for LNG.

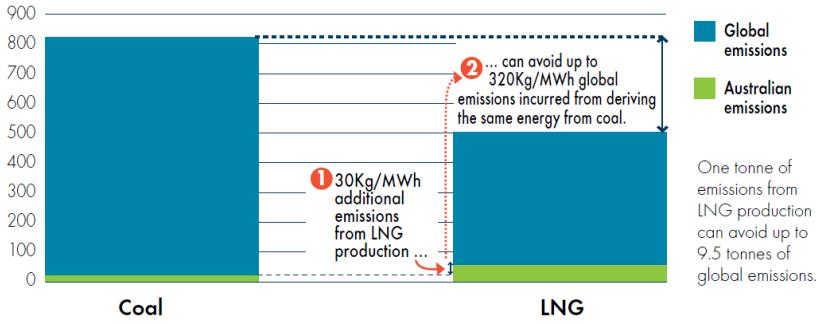
A 2008 study by WorleyParsons[10], for example, compares lifecycle greenhouse gas emissions of Australian LNG exports from the North West Shelf Project with Australian east coast black coal exports in terms of lifecycle greenhouse gas emissions: from extraction and processing in Australia through to

[10] WorleyParsons (2008; 2011), *Greenhouse Gas Emissions Study of Australian LNG*, originally prepared August 2008; updated for public release, March 2011 (available at www.woodside.com.au/Our-Approach/Climate-Change/Pages/Benefits-of-LNG.aspx).

an end use of combustion (using different power generation technologies) in China for power generation. Figure 3 below is derived from data within the study, and shows that:

- For every tonne of CO_2-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 3: Displacement of coal by LNG (kg/MWh CO_2-e by fuel source)



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

A similar 2011 WorleyParsons study[11] 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 CO_2-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 CO_2-e per year, the annual savings 37.2 Mt CO_2-e and the project life savings 1,114 Mt CO_2-e[12]. For combustion in a CCGT plant instead of a supercritical coal plant the annual savings and project life savings are 21.7 Mt CO_2-e and 652 Mt CO_2-e respectively.
- The lifecycle greenhouse intensity for LNG is about 40 per cent lower than that of coal.

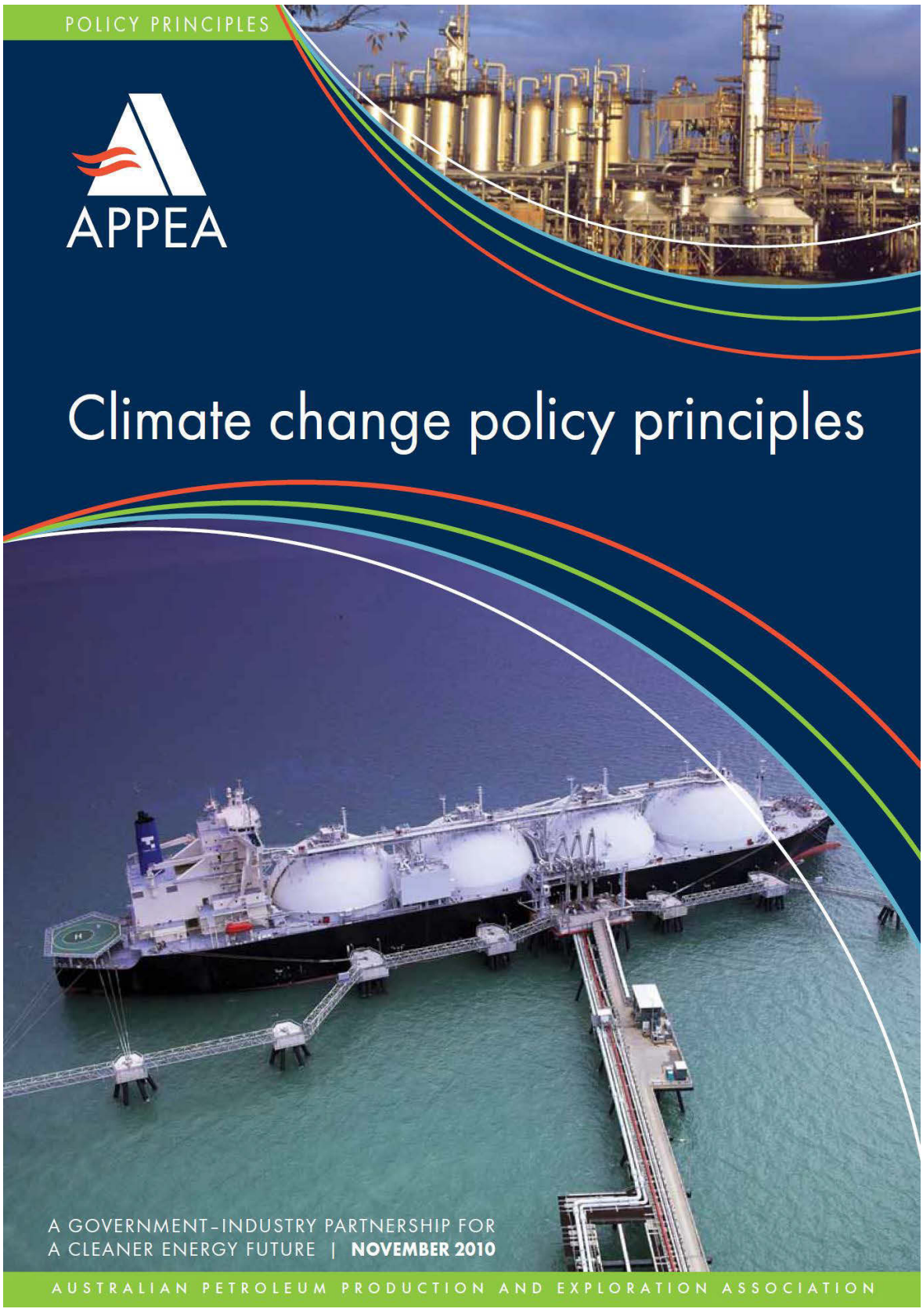
There are significant benefits to Australia and internationally from the greater use of gas as a lower greenhouse gas emitting energy source.

[11] WorleyParsons (2011), *Greenhouse Gas Emissions Study of Australian CSG to LNG*, April.
[12] This compares to total Australian annual emissions (over the year ended June 2014) of 542.6 Mt CO_2-e (see www.environment.gov.au/climate-change/greenhouse-gas-measurement/publications#quarterly).

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 current review better recognise the global role LNG can play in global greenhouse emissions reductions.

ATTACHMENT 1. APPEA'S CLIMATE CHANGE POLICY PRINCIPLES



INTRODUCTION

APPEA supports a national climate change policy that delivers abatement at least cost and facilitates investment decisions consistent with there being an international price on carbon.

What is APPEA's position on climate change?

Reducing greenhouse gas emissions is a global priority.

Our abundant natural gas resources place Australia in an enviable position to maintain long-term, clean 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.

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

1. to maintain and expand energy supplies to meet growing consumer demand
2. to address the social and ecological risks posed by rising greenhouse gas emissions and the potential for human-induced climate change.

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

Given the importance of competitively priced and reliable energy to global economies and improved living standards, it is essential that policies aimed at reducing greenhouse gas emissions do so at the lowest possible cost. This requires using an appropriately designed carbon pricing mechanism to impose economy-wide, predictable and transparent costs to shape business and consumer plans and investments. In addition, global participation is critical to reducing costs and risks.

Adaptation is also an important element of climate change policy response. Adaptation strategies must be used to mitigate the risks that a changing climate may pose.

APPEA has developed policy principles to underpin Australia's policy response to climate change.

A PLAN FOR ACTION

Developing Australia's gas resources can deliver significant national economic, environmental and social benefits. APPEA works with all Australian governments to realise these benefits.

The development of Australia's natural gas resources can deliver significant national economic, environmental and social benefits. APPEA will continue to work with all Australian governments to realise these benefits.

Australia has substantial natural gas resources. Developing these resources can provide significant national economic and social benefits. The relatively low-cost emissions abatement opportunity offered by increased use of natural gas means developing these resources can also deliver significant environmental benefits.

In order to realise these benefits, APPEA will continue working with all Australian governments to:

- support a national climate change policy response consistent with the policy principles outlined in this paper
- work to increase the supply of natural gas for electrical power generation thereby lowering the emissions intensity of Australia's electricity supply sector
- work to expand the use of natural gas in the domestic economy, for example in resource processing, with consequent reduction in the emissions intensity of resource processing
- increase the export of Australian LNG to help Australia's Asian trading partners lower their greenhouse gas emissions, thereby contributing to a potential significant reduction in global emission compared to the use of higher emitting fuels.

GUIDING PRINCIPLES FOR CLIMATE

The Climate Change Policy Principles are provided to assist policy makers in developing responses to the risks posed by global climate change.

Throughout the world, national and regional policymakers are considering a variety of legislative and regulatory options to mitigate greenhouse gas emissions. APPEA believes assessing these options requires an understanding of their likely effectiveness, scale, and cost, as well as their implications for economic growth and quality of life.

As part of this, other national policies that can facilitate the delivery of climate change policy objectives in taxation, economic growth, population growth, energy supply and and security, international trade, and environmental and social responsibility must be considered. A consistent policy approach must be developed.

Australia should make an equitable contribution, in accordance with its differentiated responsibilities and respective capability[1] to global action, to reduce greenhouse gas emissions.

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 (see unfccc.int/essential_background/convention/background/items/1349.php). 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.

CHANGE POLICY DEVELOPMENT

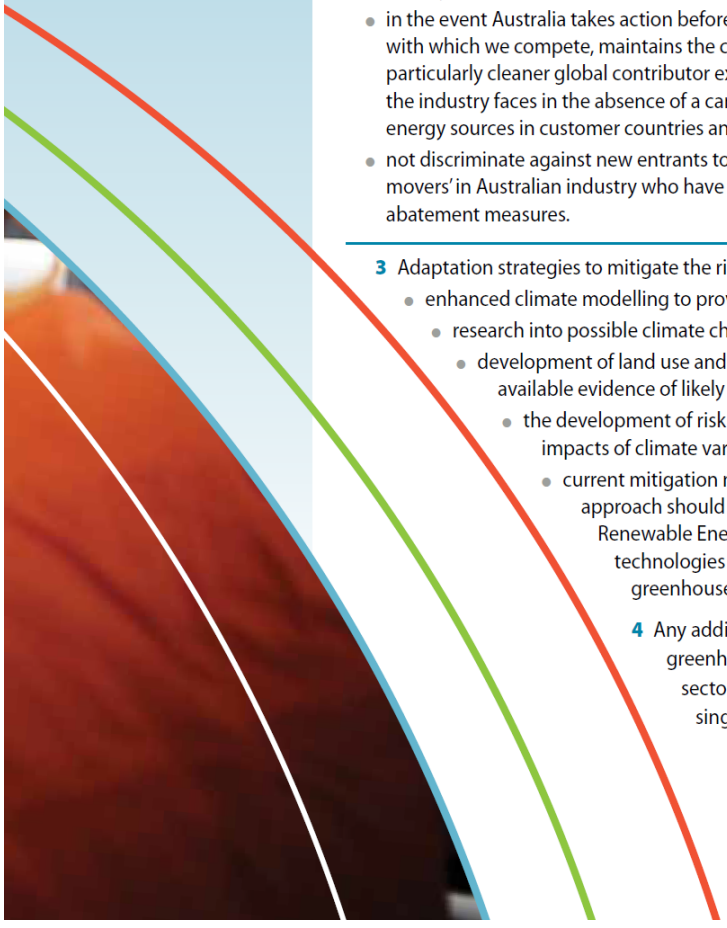
Australia needs a single national approach to regulating greenhouse gas emissions that encourages sensible, broad-based investment.

1 Australia should engage the international community in pursuing identified and beneficial environmental outcomes through greenhouse gas emissions reduction action that:

- allows for differentiated national approaches
- promotes international participation
- minimises the costs and distributes the burden equitably across the international community
- is comprehensive in its coverage
- allows for the unrestricted flow of credible emissions units between international jurisdictions
- is underpinned by streamlined, efficient and effective administrative, reporting and compliance arrangements.

2 In this global context, Australia should develop a single national approach to regulating greenhouse gas emissions. This national approach should be developed and implemented transparently to maximise community support. It must provide stability and send clear signals to encourage sensible and broad-based investment and it must not be overly complex. This approach should:

- deliver emissions reductions at the lowest possible cost to the Australian economy — this is best achieved through a price on emissions imposed on the widest possible coverage of emissions
- address all greenhouse gases, emission sources and sinks
- recognise the widest possible range of credible offsets
- be fully integrated with Australia's energy policy
- in the event Australia takes action before comparable action is taken by the nations with which we compete, maintains the competitiveness of Australian export industries, particularly cleaner global contributor exports (such as LNG), by minimising the costs the industry faces in the absence of a carbon price being imposed on higher-emitting energy sources in customer countries and competitors
- not discriminate against new entrants to Australian industry nor disadvantage 'early movers' in Australian industry who have previously implemented greenhouse gas abatement measures.



3 Adaptation strategies to mitigate the risks posed by a changing climate should include:

- enhanced climate modelling to provide location specific climate change forecasts
- research into possible climate change impacts on the Australian environment
- development of land use and planning guidelines consistent with the available evidence of likely climate change impacts
- the development of risk management strategies to reflect likely impacts of climate variability
- current mitigation measures inconsistent with this national approach should be removed. An example of this is the Renewable Energy Target, which subsidises specific technologies and is a high-cost approach to reducing greenhouse gas emissions.

4 Any additional measures targeted at reducing greenhouse gas emissions should only apply to sectors of the economy that are not covered by single national approach.

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

2 Energy Futures Forum (2006), The heat is on: the future of energy in Australia, December (see www.csiro.au/science/energyfuturesforum.html for further details).

3 See ClimateWorks Australia (2010), Low Carbon Growth Plan for Australia: March 2010 (available at www.climateworks.com.au/low_carbon_growth_plan.html) for more information.

Gas as a low-emissions energy source in Australia

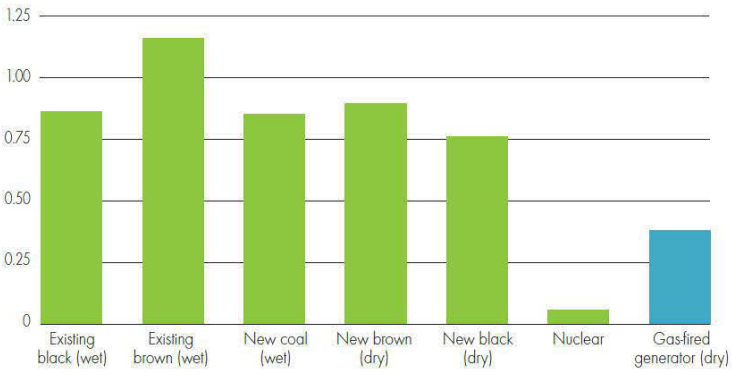
Australia could generate significant additional national economic, environmental and social benefits through greater utilisation of its substantial natural gas reserves. Using more natural gas in Australia's power generation and resource processing would significantly enhance the nation's ability to meet increasing energy needs while at the same time reducing greenhouse gas emissions.

If Australia's ongoing energy demand is met — as coal-fired power generation retires — with a combination of natural gas and renewable energy (in line with the government's renewable energy target), greenhouse gas emissions would drop by as much as 20 per cent from 2000 levels while delivering twice as much power generation. This equates to a saving of nearly 1.5 billion tonnes of carbon dioxide emissions compared with maintaining the current level of coal-fired power generation.

It also achieves a doubling of electricity production whilst delivering almost 10 per cent of the Australian Government's 2050 goal to reduce greenhouse gas emissions by 60 per cent.

These outcomes are possible because currently available natural gas technologies produce only 30 to 50 per cent of the emissions produced by current coal technologies in generating electricity. According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO), current generation coal fired power stations produce between 0.8 and 1.2 tonnes of carbon dioxide equivalent greenhouse gas emissions (CO_2-e) per megawatt hour (MWh) of generation while a combined cycle gas turbine power station produces only around 0.35 to 0.36 tonnes CO_2-e/MWh[2]. Figure 1 shows that, in electrical power generation, gas produces significantly lower greenhouse gas emissions than other fossil fuels.

Figure 1: Emission intensity by technology (CO_2-e tonnes/MWh)



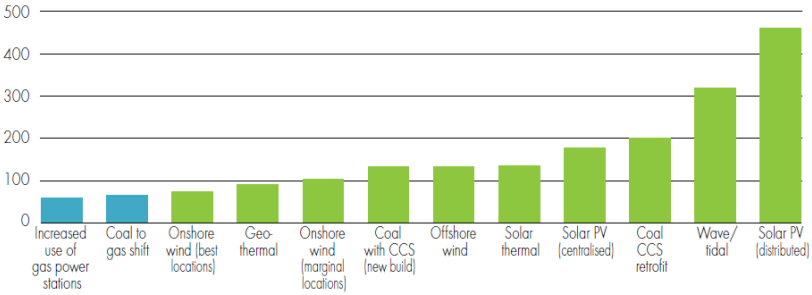
Sources: ACIL Tasman, company websites/reports, McLennan Magasanik Associates, ROAM Consulting (2009).

Natural gas is the lowest-cost means to reduce greenhouse gas emissions in electrical power generation, both through increased use of existing gas-fired power plants and a 'coal to gas shift' (ensuring new power stations are gas-fired). Figure 2 shows the cost of reducing emissions in electrical power generation[3].

Increased use of natural gas also offers other environmental benefits, such as: reduced particulates emissions; reduced emissions of sulphur dioxide (an important contributor to smog and acid rain); and 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 lowest possible cost whilst enhancing Australia's economic and export performance.

Figure 2: Cost of abatement for alternative electrical power generation technologies ($A/tonnes CO_2-e abated)



Source: ClimateWorks Australia (2010). Note: The ClimateWorks Australia report does not consider the cost of nuclear power in Australia.

Gas as a low-emissions energy source in Asia

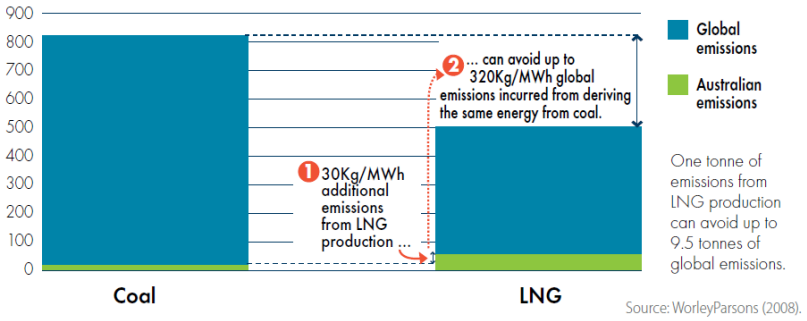
Australia's LNG industry is in a unique position to contribute substantially to the economic development of the nation and reduce greenhouse gas emissions. Australia's vast reserves of natural gas and proximity to growing markets make us well-placed to meet the global climate change challenge while substantially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

A 2008 study by WorleyParsons[4], for example, compares lifecycle greenhouse gas emissions of Australian LNG exports from the North West Shelf Project with Australian east 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 3 below is derived from data within the study, and shows that:

- for every tonne of CO_2-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 40 per cent lower than that of coal.

Figure 3: Displacement of coal by LNG (kg/MWh CO_2-e by fuel source)



Source: WorleyParsons (2008).

There are significant global benefits from increased use of Australian gas in export markets.

4 WorleyParsons (2008), *Greenhouse Gas Emissions Study of Australian LNG*, July.

APPEA

APPEA: The voice of Australia's upstream oil and natural gas industry

APPEA assists its members by working with federal, state and territory governments to ensure Australia's regulatory and commercial framework promotes investment and maximises the return to the Australian community from the nation's oil and gas resources.

Since 1959, APPEA has been the peak national body representing the collective interests of the upstream oil and gas exploration and production industry. APPEA's full member companies, those that explore for and produce Australia's oil and gas resources, account for an estimated 98 per cent of the nation's petroleum production. In addition, APPEA also represents associate member companies that provide a wide range of goods and services to the industry.

APPEA aims to secure the right conditions so that member companies can operate safely, sustainably, and profitably. The association also conducts several forums for exchanging ideas and contributing to the development of the industry's policy positions.

APPEA wants to work with governments to achieve credible industry actions and governmental climate change policies. Such policies must address climate change concerns in an economically and commercially viable way and contribute to a regulatory and commercial framework that promotes investment and maximises the return to the Australian community from the nation's oil and gas resources.

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AUSTRALIAN PETROLEUM PRODUCTION AND EXPLORATION ASSOCIATION

ATTACHMENT 2. 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.

THE IMPORTANCE OF NATURAL GAS AS A LOW GREENHOUSE GAS EMISSIONS ENERGY SOURCE IN AUSTRALIA

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

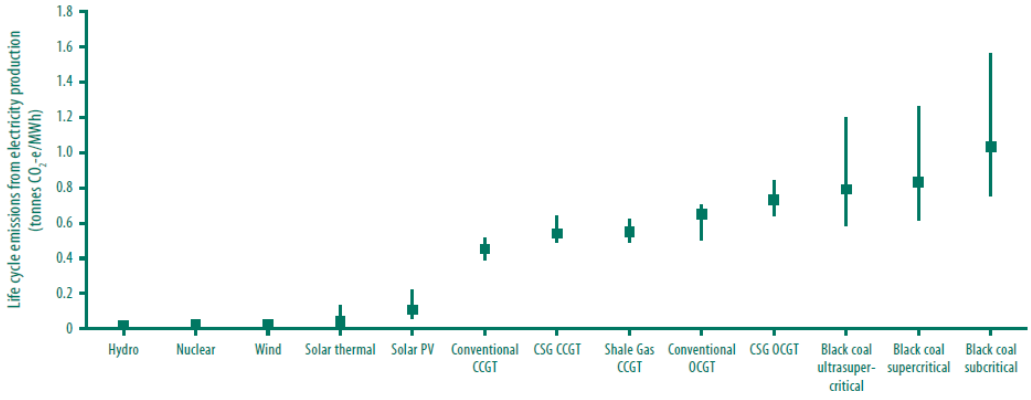
Using more natural gas in Australia's power generation and resource processing would significantly enhance the nation's ability to meet increasing energy needs while at the same time reducing greenhouse gas emissions.

These outcomes are possible because currently available natural gas technologies produce only 30 to 50 per cent of the emissions produced by current coal technologies in generating electricity.

According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (and a range of energy industry analysts), current generation coal-fired power stations produce between 0.8 and 1.2 tonnes of carbon dioxide equivalent greenhouse gas emissions (CO_2-e) per megawatt hour (MWh) of generation while a combined cycle gas turbine power station produces only around 0.35 to 0.36 tonnes CO_2-e/MWh[13].

This is illustrated in Figure 4, which shows the significantly lower greenhouse gas emission associated with the gas-fired electrical power generation compared to the use of other conventional fuels.

Figure 4: Emissions intensity of various fuel types for electricity generation (tonnes CO_2-e/MWh)



Source: ACOLA (2013).

[13] Australian Council of Learned Academies (2013), *Engineering Energy: Unconventional Gas Production, a study of shale gas in Australia Final Report*, 4 June (available at www.acola.org.au/index.php/projects/securing-australia-s-future/project-6).

Natural gas provides the one of the lowest cost means by which Australia can reduce greenhouse gas emissions in the electrical power generation sector, both through increased use of existing gas-fired power stations and a 'coal to gas shift' (that is, new gas-fired power stations).

Natural gas is also an important safeguard for intermittent renewable energy sources. For example, modelling done by South Australia's Electricity Supply Planning Council notes that every 5,000MW of wind power generation requires around 2,100MW of gas-fired power generation to ensure that a reliable supply of electricity is available to the grid[14].

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

- Reduced emissions of particulates.
- Reduced emissions of sulphur dioxide (an important contributor to smog and acid rain).
- 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 lowest possible cost whilst enhancing Australia's economic and export performance.

THE IMPORTANCE OF NATURAL GAS AS A LOW GREENHOUSE GAS EMISSIONS ENERGY SOURCE IN ASIA

The unique role Australia's LNG industry can play in contributing substantially to the economic development of the nation and reduce greenhouse gas emissions is considered on page 10 of this submission in the context of Australia's future emissions outlook.

SYNTHESIS REPORT OF THE FIFTH ASSESSMENT REPORT (AR5) BY THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC): HIGHLIGHTING THE ROLE OF NATURAL GAS

The key role natural gas can play in reducing global emissions was highlighted in the Synthesis Report of the Fifth Assessment Report (AR5), released by the Intergovernmental Panel on Climate Change (IPCC) in November 2014[15].

In considering the role of natural gas, the AR5 Synthesis Report found (on page SYR-51):

> *GHG emissions from energy supply can be reduced significantly by replacing current world average coal-fired power plants with modern,* ***highly efficient natural gas combined-cycle power plants*** *or combined heat and power plants … {WGIII SPM.4.2}* [EMPHASIS ADDED]

[14] Electricity Supply Industry Planning Council (2008), *Submission to AEMC Review of Energy Market Frameworks in Light of Climate Change Policies*, November (available at www.aemc.gov.au/Media/docs/Electricity%20Supply%20Industry%20Planning%20Council-51706fed-d681-4e3a-ba64-de54e8de7176-0.PDF).

[15] See www.ipcc.ch/report/ar5/index.shtml and www.ipcc.ch/report/ar5/syr/ for further information.