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SENATE SELECT COMMITTEE ON CLIMATE POLICY

APPEA Submission

APRIL 2009

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EXECUTIVE SUMMARY

Introduction

The Australian Petroleum Production & Exploration Association (APPEA) is the peak national body representing the Australian upstream oil and gas industry. APPEA member companies collectively produce around 98 per cent of Australia's oil and gas.

APPEA, and its members, are committed to working towards a profitable, safe, environmentally responsible and socially responsible oil and gas exploration, development and production industry.

The Australian Upstream Oil and Gas Industry

It is important to place the APPEA's views on the Inquiry's terms of reference 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.

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.

A strong, vibrant and growing industry is essential to the on-going health of the Australian economy.

The Case for Natural Gas

Governments around the world, including in Australia, have recognised that for the foreseeable future the world economy will remain dependent on fossil fuels.

Australia's natural gas resources have the unique potential, in both the short-term and the long-term, to significantly reduce greenhouse gas emissions both domestically, through the greater penetration of natural gas in the domestic market particularly in electricity generation, and in the Asia-Pacific region, through increased liquefied natural gas (LNG) exports.

This ability sets the industry apart from most industries that will be impacted by greenhouse policies responses.

With gas-fired power generation having between 30 and 50 per cent of the emissions associated with coal-fired power generation, greater penetration of natural gas into the domestic market and LNG into the export market would produce improved greenhouse outcomes.

It is vital, therefore, that Australia's greenhouse policy response encourages the further use of natural gas both domestically and in the region.

The choice of emissions trading as the central policy to reduce Australia's greenhouse gas emissions

Greenhouse policies will have far reaching implications for all energy producers and users.

In providing a signal that greenhouse gas emissions result in negative externalities, emissions of greenhouse gases are priced by an emissions trading scheme, and the cost of emitting activities rises.

An assessment of emissions trading schemes: key upstream oil and gas industry views

The basic principles for judging 'good' greenhouse policy advocated by APPEA as the basis for assessing greenhouse policy responses, such as an emissions trading scheme, are:

- economic efficiency;
- environmental effectiveness; and
- equity.

Emissions trading schemes (and potentially emissions taxes) are generally superior to regulatory standards in achieving cost-effective abatement insofar as they provide more flexibility to firms to achieve given reductions.

Environmental effectiveness refers to the effectiveness of the instrument in question in achieving the desired environmental outcome –in this particular case, a reduction in the level of greenhouse gas emissions.

Emissions trading schemes can have equity considerations that are difficult to overcome vis-à-vis taxes –for example, whether allocations are based on past emissions or population is a relevant question in an international context where developing countries are involved.

Emissions trading schemes are likely to involve relatively high (compared to an emissions tax, for example) administrative costs. Emissions trading schemes may be complex to establish and administer and initial permit allocation can prove contentious regardless of how they are allocated.

It is certainly the case in Australia at present that the proposed emissions trading scheme suffers from a number of shortcomings in respect to complexity and initial permit allocations.

A summary of the key design features of emissions trading schemes: key upstream oil and gas industry views

Emissions trading schemes can potentially take many forms and there is significant room for variation between schemes in terms of their design. The domestic emissions trading scheme proposed in Australia (referred to by the Australian Government as the Carbon Pollution Reduction Scheme) is one, but not the only, example.

Whatever the proposed form, scheme design is crucial.

The treatment of trade-exposed industries under a domestic greenhouse policy response: the role of LNG as a cleaner global contributor

As has been considered and accepted by every major credible analysis of an emissions trading scheme undertaken in Australia and internationally, if policies and measures such as emissions trading schemes 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.

APPEA has long recommended that measures to deal with this international policy distortion impacting on trade exposed industries must be a central feature of any emissions trading scheme introduced in Australia.

In doing so, it is important to recall why the trade-exposed industries issue arises at all –that is, the failure of Governments to reach a global agreement on carbon pricing and the consequent implications for industry competitiveness that arise from unilateral actions by any one Government.

APPEA agrees with Professor Ross Garnaut that a fundamental principle in designing a domestic emissions

trading scheme in the absence of a global scheme must be to ensure that it produces similar production and investment outcomes to those reasonably expected under a global scheme.

Subjected to a global price of carbon, the international natural gas industry will expand, as a consequence of having 50 to 70 per cent fewer emissions when used in electricity generation compared to the coal alternative. Yet, the domestic scheme, as proposed, would see the industry's growth, growth that is both economically efficient and environmentally effective, constrained.

With that in mind, the industry's key objective in considering this issue is to ensure that the Australian LNG industry, as one of Australia's key trade-exposed industries, does not bear an additional cost impact for as long as our competitors and customers are not subject to a similar impost.

The importance of this issue cannot be underestimated: a domestic emissions trading scheme would be highly prejudicial to Australia's economic performance without a provision to preserve industry's international competitiveness.

The proposed Australian scheme (as outlined in the package of legislation released on 10 March 2009) fails to achieve this outcome and requires significant amendment.

APPEA acknowledges that the Government, through the White Paper, has taken steps to clarify the impact of the proposed emissions trading scheme on Australia's LNG industry. This means that provided it meets the criteria set out in the legislative package, LNG may qualify for an administrative allocation of permits to cover up to nominally 60 per cent of emissions in the first year of the scheme's operation.

It remains the case, however, that the industry will be subject to a significant cost burden that is not borne by its LNG competitors or customers. Reducing the international competitiveness of Australia's LNG industry will lead to growth prospects being constrained and a likely commensurate increase in global emissions as developing countries continue to expand their use of more carbon intensive fuels.

LNG has been characterised as an 'anomaly' within the design of a domestic emissions trading scheme. Although producing LNG is energy and emissions intensive and adds to greenhouse gas emissions in Australia, as was considered above, natural gas makes a substantial net contribution to reducing global greenhouse gas emissions.

As the world inevitably shifts to a preference for cleaner burning fuels, the substantial strategic value of Australia's natural gas assets can only increase.

Subjected to a global price of carbon, the international natural gas industry will expand, as a consequence of having 50 to 70 per cent fewer emissions when used in electricity generation compared to the coal alternative. Yet, the domestic scheme, as proposed, would see the industry's growth, growth that is both economically efficient and environmentally effective, constrained.

The LNG industry can think of no explanation for a design that results in a cost burden for an Australian industry that is poised for growth precisely because of the world's desire for less greenhouse gas emitting sources of energy.

Inadvertently, it could send a message that Australia is unconcerned that this growth, and all the environmental, economic and social benefits associated with it, will occur, instead, in those LNG producing countries with which we compete. It is certainly inconsistent with the objectives implied by the Inquiry's terms of reference.

The case for the industry not to be exposed to any cost associated with a domestic emissions trading scheme while ever our competitors and customers (with cheaper, higher emitting energy choices available) are not subject to similar imposts is compelling.

Clearly, significant amendments to the proposed scheme are required to provide an efficient and effective greenhouse policy response that appropriately recognises the domestic contribution of natural gas and the global contribution of LNG exports.

APPEA recommends that any greenhouse policy response introduced in Australia, such as that contained in the draft *Carbon Pollution Reduction Scheme Bill 2009*, ensure the LNG industry does not face any cost associated with a domestic emissions trading scheme while ever our competitors and customers (with cheaper, higher emitting energy choices available) are not subject to similar imposts.

- This could be achieved, for example, by ensuring an administrative allocation of permits of 100 per cent of direct ('scope 1') emissions and 100 per cent of permits needed to fully offset costs passed-through by non-trade exposed industry (typically in electricity prices, gas prices and feedstock prices).
- This allocation should be maintained until Australia's LNG customers and competitors face similar imposts.
- Permit allocation should be made to existing operations based on fixed relationships between output and direct emissions and non-trade exposed cost pass-through measured in a typical recent year or average of years.

A summary of the key design features of alternative greenhouse policy responses, other than an emissions trading scheme

Alternative greenhouse policies and measures can be categorised into three broad groups:

- market-based mechanisms, including taxes on greenhouse gas emissions, and carbon and/or energy subsidies;
- regulations (including standards, bans and non-tradable permits); and
- voluntary agreements.

Key amongst the alternatives considered are:

- an emissions tax (carbon tax);
- a hybrid scheme (the McKibbin-Wilcoxen Blueprint);
- a consumption-based approach (as proposed by Carmody & Associates); and
- an output-based allocation cap and trade scheme (as proposed by Frontier Economics).

The relative contributions to overall emission reduction targets from complementary measures

APPEA recognises that a comprehensive greenhouse policy framework requires a portfolio of measures, some of which may complement an emissions trading scheme and others of which are justified in their own right.

The key programs/policy areas for APPEA include:

- removal of regulatory impediments to the greater use of gas in the national energy market; and

- appropriate investment incentives, such as those to support low emissions technologies.

The growth of separate Australian Government and State and Territory Government measures 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 sovereign risk, misallocation of resources and deadweight losses to the economy associated with the hotchpotch of climate change mitigation measures in Australia is significant and is growing. A single, nationally coordinated approach by all Australian governments is urgently required.

APPEA notes and supports the work underway through the Council of Australian Governments (COAG) to attempt to address some aspects of the need for a national approach. The COAG Principles announced in November 2008 are an important step forward. It is vital that the rigorous application of these principles to an assessment and rationalisation of the separate Australian Government and State and Territory Government policies and greenhouse initiatives must be undertaken as a matter of urgency and involve independent assessment processes and stakeholder engagement.

Any introduction of an emissions trading scheme (or alternative policy) must be accompanied by a significant rationalisation of greenhouse measures across all Australian jurisdictions. 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. Indeed, such a rationalisation should be regarded as a necessary but not sufficient condition for the introduction of an emissions trading scheme. Under no circumstances should such a scheme merely be added to the hotchpotch of existing measures.

1. INTRODUCTION

The Australian Petroleum Production & Exploration Association (APPEA) is the peak national body representing the Australian upstream oil and gas industry. APPEA member companies collectively produce around 98 per cent of Australia's oil and gas. A full list of APPEA's members 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, for example, participated in every major consideration of emissions trading schemes in Australia, most recently the work of the Australian Government in developing its emissions trading scheme Green Paper and White Paper in 2008 and the Exposure Draft Legislation released in March 2009. APPEA has most recently made a submission to the Senate Standing Committee on Economics as part of its *Inquiry into the Exposure Drafts of the Legislation to implement the Carbon Pollution Reduction Scheme*[1].

With that in mind, APPEA welcomes the opportunity to provide a submission to the Senate Select Committee on Climate Policy.

As part of its commitment to addressing greenhouse issues, APPEA was an original signatory to the Greenhouse Challenge Program in 1996[2]. Greenhouse Challenge (now Greenhouse Challenge Plus) members from the upstream oil and gas industry have abated over 22 million tonnes (Mt) of carbon dioxide equivalent (CO_2-e) since that time. Overall, emissions from the upstream oil and gas industry account for less than 4 per cent of Australia's total emissions.

APPEA is also a member of the Australian Industry Greenhouse Network (AIGN), a network of industry associations and individual businesses which 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[3]. APPEA has contributed to the AIGN submission to the Committee. The AIGN submission covers some areas of the Committee's terms of reference not addressed in APPEA's submission.

In addition to the APPEA submission, a number of APPEA members have made individual submissions to the Committee. APPEA's members have a range of views on greenhouse policy, and on emissions trading schemes in particular, and this response should be

[1] A copy of the APPEA submission (submission 111) is available at www.aph.gov.au/Senate/committee/economics_ctte/cprs_09/submissions/sublist.htm).
[2] Greenhouse Challenge Plus is designed to reduce greenhouse gas emissions, accelerate the uptake of energy efficiency, integrate greenhouse issues into business decision-making and provide more consistent reporting of greenhouse gas emissions levels. The APPEA Chief Executive is currently the Industry co-Chair of the Industry-Government Greenhouse Partnership Committee, that provides a forum for consultation on the key issues impacting on Greenhouse Challenge Plus and to ensure the effective development and operation of the program. (see www.environment.gov.au/settlements/challenge/members/iggpc.html) for further information.
[3] See www.aign.net.au for further information.

read in conjunction submissions from individual APPEA members. APPEA commends these submissions to you.

APPEA, and its members, are committed to working towards a profitable, safe, environmentally responsible and socially responsible oil and gas exploration, development and production industry.

Governments need to continue to recognise that greenhouse policies, including any consideration of an emissions trading scheme, must allow Australian industry to maintain its international competitiveness.

APPEA works with governments and other stakeholders to achieve credible industry actions and governmental greenhouse policies that address greenhouse concerns in an economically and commercially viable way, including ways to maintain international competitiveness. As part of this, the upstream oil and gas industry's *Greenhouse Response Strategy* is a public statement, released in November 2003, of the industry's approach to greenhouse policy. A copy of the APPEA *Greenhouse Response Strategy* can be found at **Attachment 1**[4].

In addition, the industry, in 2006, embarked on the development of an Upstream Oil and Gas Industry Strategy. Lead by APPEA in consultation with State, Territory and Australian Governments, the objective of the Strategy is:

> *... to ensure the value of Australia's oil and gas resources to the Australian people is maximised, petroleum energy security delivered and long-term sustainability of an Australian oil and gas industry assured.*

The Strategic Leaders' Report, *Platform for Prosperity*, was released in April 2007[5] and provides an overview of the opportunities and challenges facing the Australian upstream oil and gas industry, the issues that could prevent the opportunities from being fully realised, and the options for addressing those issues.

APPEA's submission has been generally organised to address the Committee's terms of reference. However, the submission does not directly address every aspect of the terms of reference. Rather, it focuses on those areas that are particularly important for Australia's upstream oil and gas industry.

[4] The *Greenhouse Response Strategy* can also be downloaded from the APPEA website, at www.appea.com.au/content/pdfs_docs_xls/PolicyIndustryIssues/APPEAGreenhouseResponseStrategyNov03.pdf.

[5] See www.appea.com.au/index.php?option=com_content&task=blogcategory&id=79&Itemid=81 for further information about the Industry Strategy process and www.appea.com.au/content/pdfs_docs_xls/IndustryStrategy/Strategic%20Leaders%20Report.pdf for a copy of the *Platform for Prosperity* report.

2. THE AUSTRALIAN UPSTREAM OIL AND GAS INDUSTRY

It is important to place the APPEA's views on the Inquiry's terms of reference 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.

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.

A strong, vibrant and growing industry is essential to the on-going health of the Australian economy.

In addition, as will be considered further below, the upstream oil and gas industry is responsible for:

- Australia's largest resource project – the North West Shelf Project[6];
- Australia's largest ever export contract – the contract to supply liquefied natural gas (LNG) from the North West Shelf Joint Venture to the Guangdong Dapeng LNG project in southern China; and
- contemplating Australia's single largest greenhouse gas mitigation investment – the geosequestration project as part of the Gorgon LNG Project[7] – amongst a range of other significant and important greenhouse gas mitigation investments.

2.1 An overview of the Australian upstream oil and gas industry

An overview of the industry's economic contribution, structure, the global context within which the Australian industry operates and Australia's competitive position, reveals that:

- oil and gas account for 33 per cent and 21 per cent respectively of Australia's primary energy consumption. In 2007-08, the estimated value of oil and gas production in Australia was over $22 billion while tax payments to the Australian and State and Northern Territory Governments totalled around $6 billion;

[6] For more information about the North West Shelf Project and the contract to supply LNG to the Guangdong Dapeng LNG project, see www.woodside.com.au/Our+Business/Production/Australia/North+West+Shelf.
[7] For more information about the Gorgon LNG Project's greenhouse gas mitigation plans, see www.gorgon.com.au/03moe_greenhouse.html.

- exports of petroleum, including crude oil, liquefied petroleum gas (LPG), LNG and refined petroleum products, totalled $19.7 billion in 2007-08 and are Australia's third largest commodity income earner;

- the industry directly employs more than 21,000 Australians and through companies providing goods and services to the industry – suppliers, contractors and support companies –indirectly employs more than 30,000 people; and

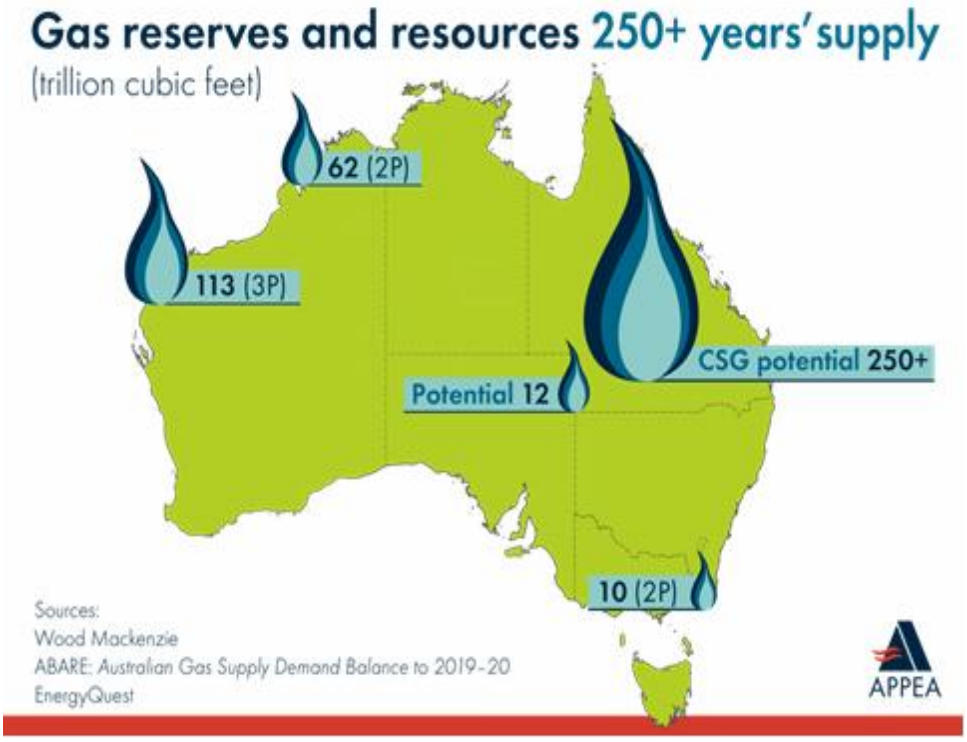
- historically, gas supplies in the east of the country have focussed exclusively on servicing the domestic market. Recent years have seen major coal seam gas (CSG) developments in Queensland and New South Wales add significantly to east coast natural gas supplies

    - significantly, this has resulted in recent proposals concerning the establishment of an LNG export industry on the east coast of Australia, exporting LNG from Queensland

    - were these projects to proceed, they would be unique in using CSG, sourced from Queensland's extensive coal deposits, as the fuel source.

The following map[8] shows the location and size of Australia's major natural gas deposits and associated reserves and resources.

Figure 1: Australian Gas Reserves and Resources, 2009



[8] Australian Government (2008), *Australian Liquefied Natural Gas (LNG) – Clean Energy for a Secure Future*, prepared by the Department of Resources, Energy and Tourism, July (see www.ret.gov.au/resources/upstream_petroleum/australian_liquefied_natural_gas/Pages/Home.aspx for further information).

2.2 Australia's competitive position

The Australian upstream oil and gas industry operates within a globally competitive environment. It competes for international investment funding and resources, and sells oil and natural gas within Australia and in competitive international markets.

Australia is generally perceived to offer relatively low prospectivity for oil with relatively low discovery rates and small average field sizes. Gas prospectivity is good but Australia already has many large undeveloped gas fields and new gas discoveries are often remote from markets and difficult to commercialise.

The upstream oil and gas industry is highly capital intensive and tens of billions of dollars of capital will be needed over the next two decades if frontier exploration is to expand and new oil and gas projects are to be developed.

Australia has offered a reasonably attractive petroleum investment environment (with some exceptions, for example, the tax depreciation arrangements for long-lived assets is not internationally competitive – this is an issue further considered by APPEA through the Upstream Oil and Gas Industry Strategy process) in the past and developed a reputation as being a generally "sound place to do business".

Its relatively low sovereign risk, transparent legal and regulatory processes, stable political and economic environment, competitive markets and solid investment in pre-competitive geoscience research are significant advantages which encourage global oil companies to direct a part of their activity and investment to Australia.

Most companies will seek to have a spread of investments across the risk/return spectrum and Australia fits into that part of the spectrum offering lower risk than many other parts of the world.

In recent years Australia's perceived exploration risk for oil has increased due to the lack of oil exploration success. Australia has therefore moved up the oil exploration risk curve. This perception of higher risk needs to be offset by a commensurate increase in expected returns, particularly for exploration in high-risk frontier areas.

Development risk in Australia is also increasing. Oil project developments have tended to be in deeper water and more technically challenging. The large capital requirements, long construction periods and long payback periods associated with remote LNG projects also increase Australia's risk profile.

To optimise the value of its petroleum industry, Australia also needs to constantly monitor its overall competitive position for investment.

Clearly, this includes the impact of Australia's greenhouse policies, including any consideration of an emissions trading scheme.

It is vital, therefore, that the introduction of any greenhouse gas policy response is sensitive to the competitive position of the Australian upstream oil and gas industry.

3. THE CASE FOR NATURAL GAS

3.1 Background: the importance of natural gas as a low greenhouse gas emissions energy source

Governments around the world, including in Australia, have recognised that for the foreseeable future the world economy will remain dependent on fossil fuels[9].

As will be considered in Sections 3.1.1 and 3.1.2, Australia's natural gas resources have the unique potential, in both the short-term and the long-term, to significantly reduce greenhouse gas emissions both domestically, through the greater penetration of natural gas in the domestic market particularly in electricity generation, and in the Asia-Pacific region, through increased LNG exports. This ability sets the industry apart from most industries that will be impacted by greenhouse policies responses.

The case for natural gas as a strategic national asset was presented in detail in a 25 March 209 address to the National Press Club in Canberra by Ms Belinda Robinson APPEA's Chief Executive[10].

3.1.1 The importance of natural gas as a low greenhouse gas emissions energy source in Australia

There is an opportunity for Australia to generate significant additional national economic, environmental and social benefits from its substantial natural gas resources including via:

- the creation of a less carbon intensive national electricity market. In contrast to longer-term possibilities around 'low emission' electricity generation technologies, natural gas technologies available today 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 800 and 1,300 kg of CO_2 per megawatt hour (MWh)of generation while a combined cycle

[9] See, for example, International Energy Agency (2008), *World Energy Outlook 2008* (available at www.worldenergyoutlook.org/2008.asp) and Energy Information Administration (2008), *International Energy Outlook 2008* (available at www.eia.doe.gov/oiaf/ieo/index.html).
[10] A copy of the address is available at www.appea.com.au/content/pdfs_docs_xls/press_club_presentation_final_250309.pdf.

gas turbine (CCGT) power station produces around 350 to 360 kg/MWh[11]

- by using more natural gas in power generation, from today, Australia could significantly enhance its ability as a nation to meet our increasing energy needs but at the same time minimising greenhouse gas emissions

- put another way, gas-fired power generation can reliably and affordably deliver 80 per cent of the emissions reductions that would be achieved by retro-fitting an existing coal-fired power plant with carbon capture and storage technology – an option not available in the foreseeable future;

- gas-fired power generation uses very little water – as little as half to $^{1}/_{2000^{th}}$ of the water used per Mwh of that used by an existing coal-fired power station[12];

- it has a very small environmental footprint – 20 hectares for an average 1,000MW plant[13], and low impact and low visibility infrastructure requirements (this compares to about 6,000 to 8,000 hectares for solar and 8,000 to 14,000 hectares for wind);

- it is a complementary partner for intermittent renewable energy sources

  - modelling for South Australia's Electricity Supply Planning Council shows 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];

- an expansion of the use of gas in resource processing, with consequent reduction in the carbon intensity of the resource processing sector;

- development of alternative transport fuels to enhance supply reliability and lower carbon intensity;

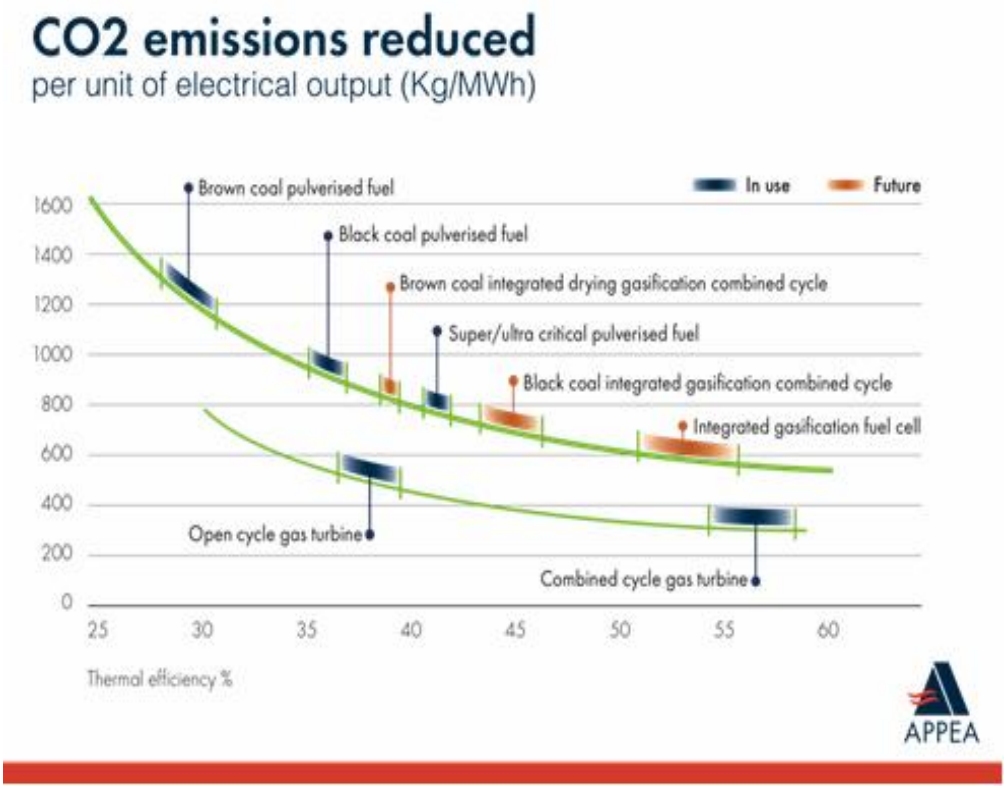
- improvements in energy market security and efficiency, for example, CCGT power station lead times and capital costs are lower for gas developments compared to coal. This allows for better staging of incremental development to meet demand requirements; and

[11] 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).
[12] ACIL Tasman, Company websites/reports, MMA, ROAM Consulting (2007).
[13] Origin Energy (2006), *Mortlake Power Station Project Fact Sheet*, March (available at www.originenergy.com.au/files/Mortlakefactsheet2.pdf).
[14] South Australia's 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/electricity.php?r=20081215.162945).

- development of new chemical industries.

In the case of greenhouse gas emissions, Figure 2 below graphically illustrates the greenhouse gas emission benefits of gas-fired generation. It shows that, unless carbon capture and storage (CCS) technology is viable, CCGT generation will remain by far the fossil fuel generation technology with the lowest greenhouse gas emissions.

Figure 2: CO_2 emissions reduced per unit electrical output



Source: Wright, Dr J (2007), CSIRO –Energy Transformed Flagship

Similarly, work commissioned for the Uranium Mining, Processing and Nuclear Energy Review, and presented its in report *Uranium Mining, Processing and Nuclear Energy – Opportunities for Australia?*[15] released in December 2006, found that greenhouse gas emissions from a 1,000 MW power plant operating at an average 85 per cent capacity utilisation would be approximately 8.7 Mt CO_2-e/year for a subcritical brown coal fired power plant, approximately 6.4 Mt CO_2-e/year for a supercritical black coal fired plant and 4.3 Mt CO_2-e/year for a CCGT plant.

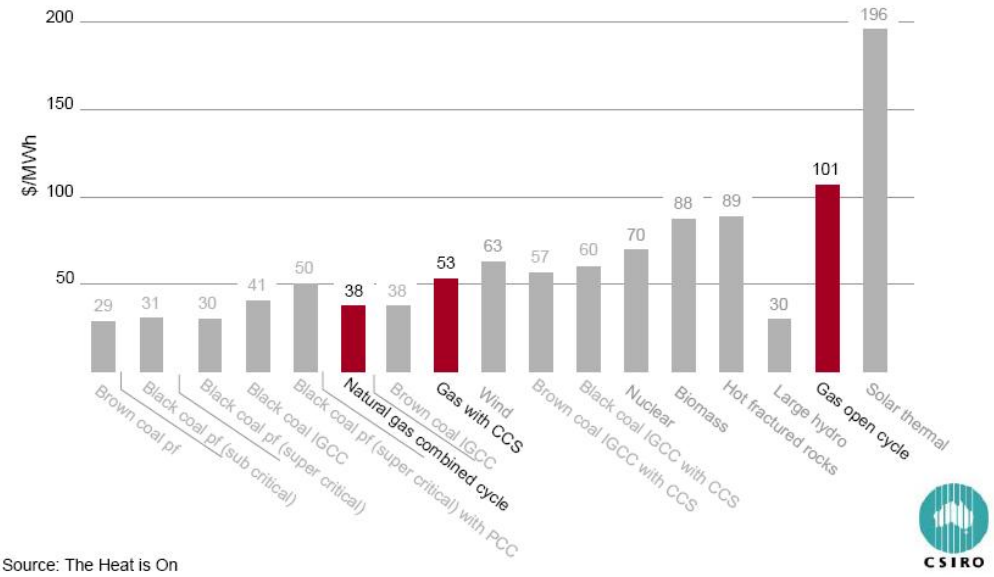
This means that over a lifetime of 40 years, the greenhouse gas emissions savings from a CCGT power plant would be 178 Mt CO_2-e relative to a brown coal plant and 85 Mt CO_2-e relative to a black

[15] See pandora.nla.gov.au/pan/66043/20070301-0000/www.pmc.gov.au/umpner/docs/nuclear_report.pdf for further information.

coal plant. As a reference point, Australia's total electricity sector greenhouse gas emissions in 2006 were around 205 Mt CO_2-e[16].

In addition to its greenhouse friendly nature, natural gas represents a cost competitive energy source. This is particularly so when you consider the generation costs of natural gas compared to other energy generation technologies, particularly coal, which shows (Figure 3) the cost differential between current energy sources is not significant.

Figure 3: Estimated electricity generation costs of selected centralised electricity generation technologies



Source: The Heat is On

3.2.2 The importance of natural gas as a low greenhouse gas emissions energy source in the Asia-Pacific region

Australia's LNG[17] industry is in a unique position not only to contribute substantially to the economic development of the nation but also to help minimise the growth of greenhouse gas emissions in the Asia-Pacific region. The vast reserves of natural gas located in close proximity to growing Asia-Pacific markets make Australia well-placed to positively assist in meeting the global climate change challenge while substantially contributing to Australia's economic growth.

The greenhouse benefits of LNG as a cleaner burning fuel source are well established and have long been recognised, including by the Australian Government. For example, in the report, *Australian*

[16] Australian Government (2008), *Australia's National Greenhouse Gas Accounts: National Inventory by Economic Sector 2006*, (available at www.climatechange.gov.au/inventory/2006/pubs/inventory2006-economic.pdf).

[17] LNG is natural gas that has been cooled to the point that it condenses to a liquid, which occurs at a temperature of approximately -161°C and at atmospheric pressure. Liquefaction reduces the volume by approximately 600 times, making it more economical to transport between continents in specially designed ocean vessels. LNG technology makes natural gas available throughout the world (for more information, see www.gorgon.com.au/06-news/factsheets/Gorgon%20Fact%20Sheet%20-%20What%20is%20LNG.pdf).

Liquefied Natural Gas (LNG) – Clean Energy for a Secure Future[18] (a copy of which can be found at **Attachment 2**), the Minister for Resources, Energy and Tourism, the Hon Martin Ferguson AM MP, noted:

> *The technical, economic and environmental advantages of liquefied natural gas (LNG) have made a global fuel of choice.*
>
> *The Australia, Western Australia and Northern Territory Governments, and the industry, share a vision for a strong, internationally competitive LNG industry.*

The Prime Minister, the Hon Kevin Rudd MP, has also put on record his support for the industry. At a media conference in Darwin on 24 July 2008, the Prime Minister noted[19]:

> *... the Australian Government is a big believer in the long-term of LNG and in the expansion of LNG in the future.*

For now, and for a considerable time into the future, LNG offers a greenhouse advantage in that it is low in emissions compared to other fossil fuels.

On a global lifecycle basis[20] the production, transport and use of LNG generates significantly lower emissions per unit of delivered energy than alternative fossil fuels:

- a 1996 study by the CSIRO[21] found that North West Shelf LNG, when used for electricity generation in Japan, produced lifecycle emissions of approximately 470 kilograms of carbon dioxide equivalent per megawatt hour equivalent (kg CO_2-e/MWh-e)
  - this was far lower than emissions generated from oil produced from the Middle East (around 700 kg CO_2-e/MWh-e) or coal from the east coast of Australia (around 830 kg CO_2-e/MWh-e)
  - these figures show that natural gas (from LNG) used in electricity generation has 43 per cent lower lifecycle emissions than coal

[18] Australian Government (2008), *Australian Liquefied Natural Gas (LNG) – Clean Energy for a Secure Future*, prepared by the Department of Resources, Energy and Tourism, July (see www.ret.gov.au/resources/upstream_petroleum/australian_liquefied_natural_gas/Pages/Home.aspx for further information).
[19] Rudd MP, the Hon Kevin (2008), *Joint Press Conference with the Chief Minister of the Northern Territory, Paul Henderson*, Darwin, 24 July (available at www.pm.gov.au/media/Interview/2008/interview_0378.cfm).
[20] For LNG, this lifecycle includes extraction in Australia, processing/liquefaction in Australia, transport/shipping to the export customer, regasification in customer country, combustion/power generation in that country while for black coal, this includes mining and processing in Australia, transport/shipping to the export customer, combustion/power generation in the customer country.
[21] CSIRO (1996), *Lifecycle emissions and energy analysis of LNG, oil and coal*, December.

- in summary, the CSIRO study shows that for every tonne of CO_2-e emitted in LNG production within Australia, 4 tonnes of emissions from the coal alternative can be avoided globally

- this work has been updated and validated in 2008 through a report commissioned from WorleyParsons[22]. The study provides a comparison of Australian LNG exports from the North West Shelf Project with Australian east coast coal exports in terms of lifecycle greenhouse gas emissions

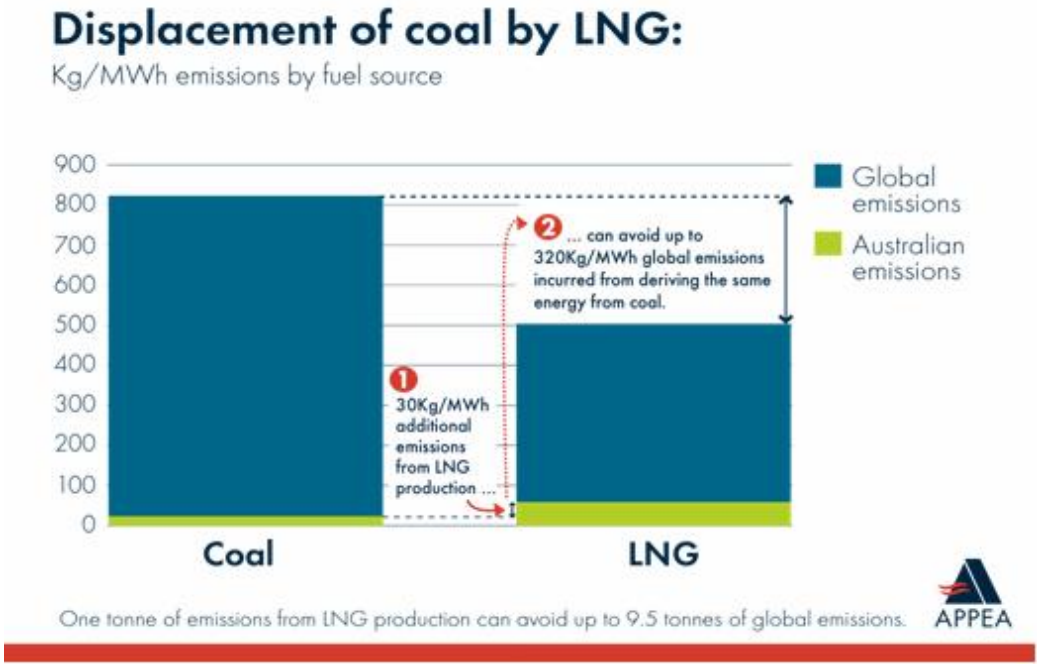
  - it shows that for every tonne of CO_2-e emitted in LNG production within Australia, between 5½ and 9½ tonnes of emissions from the coal alternative can be avoided globally

  - it is clear from the data shown in the report that LNG has a substantially lower greenhouse footprint associated with it compared to coal –not just in reference to the combustion emissions, but throughout its lifecycle

  - the study shows that the lifecycle greenhouse intensity for LNG is approximately 40 per cent lower than that of coal.

This information has also been confirmed recently in unrelated work carried out in the United States[23]. The following figure (Figure 4) demonstrates clearly the greenhouse opportunity provided by LNG.

Figure 4: Greenhouse emissions benefits associated with Australia's LNG exports



Sources: CSIRO, WorleyParsons

[22] WorleyParsons (2008), *Greenhouse Gas Emissions Study of Australian LNG*, July.
[23] Center for Liquefied Natural Gas (2009), *Life Cycle Assessment of GHG Emissions from LNG and Coal Fired Generation Scenarios: Assumptions and Results*, PACE, Fairfax, Virginia, US, February (available at www.lngfacts.org/LNG-Research).

This means that the benefits to Australia and internationally from, in particular, the greater use of gas as a lower greenhouse gas emitting energy source, are considerable.

3.2.3 *The broader economic and social benefits of a strong, vibrant and growing upstream oil and gas industry*

As was considered above, the upstream oil and gas industry, through the Upstream Oil and Gas Industry Strategy, has –in consultation with State, Territory and Australian Governments –set itself a number of growth targets over the next decade, including that by 2017:

- exports of LNG will reach 50-60 million tonnes per year (Mtpa), up from around 15½ Mtpa currently;
- natural gas used in resources processing will double; and
- in a competitive electricity market, 70 per cent of all new electricity generation capacity installed in Australia over the next decade is gas-fired.

If these targets are met, global emissions avoided could total at least 180 Mt CO_2-e a year by 2017 compared with an alternative of coal being used to meet the energy requirements of Australia's LNG customers (at least 120 Mt) and the growth in energy demand in Australia's industrial and electricity generation sectors (around 60 Mt).

This is equivalent to more than one quarter of Australia's projected greenhouse gas emissions in 2017.

Reaching the targets established through the *Platform for Prosperity* report would also have significant economic and social benefits for Australia.

Economic modelling commissioned from economic consultants CRA International[24] and conducted by Access Economics utilising their Access Economics General Equilibrium Model (AE-GEM) shows that if Australia achieves the targets set out in the *Platform for Prosperity* report over the period to 2017, then we can expect:

- an increase of between $13 billion and $55 billion in GDP in net present value terms which is equivalent to adding between 0.24 and 0.31 percentage points to Australian GDP growth in 2017;
- an increase in real consumption of between $500 million and $21 billion in net present value terms over the period to 2017;

[24] CRA International (2007), *Implications of achieving the Upstream Oil and Gas Industry Strategy Targets*, April (available at www.appea.com.au).

- an increase in Australian exports leading to an improvement in our trade balance of $1.6 billion by 2017;

- the generation of new jobs in the oil and gas and construction industries – in 2012 at the height of the construction boom expected to be associated with the strategy 52,000 new jobs will be generated;

- the diversification of Australia's energy economy with increased penetration of gas in the domestic manufacturing industry; and

- a major boost to remote regional economies particularly in Western Australia, Queensland and the Northern Territory.

Given the significant and sustained greenhouse, broader environmental and economics benefits that flow directly from a strong, vibrant and growing Australian upstream oil and gas industry, it is vital, that Australia's greenhouse policy response, including the design and implementation of an Australian emissions trading scheme, encourages the further use of natural gas both domestically and in the region.

4. THE CHOICE OF EMISSIONS TRADING AS THE CENTRAL POLICY TO REDUCE AUSTRALIA'S GREENHOUSE GAS EMISSIONS

This section provides an overview of the issues associated with the choice of an emissions trading scheme as the central policy instrument to reduce Australia's greenhouse gas emissions. The section also provides an overview of alternative greenhouse policy instruments. This is important to address Item 1(a) of the Inquiry's terms of reference and also to provide analysis relevant to Items 1(b), (c) and (e).

With that in mind, the analysis set out in this section includes the following:

- a summary of the key design features of emissions trading schemes, and keys issues from an upstream oil and gas industry perspective; and

- an assessment of the advantages and disadvantages of an emissions trading scheme from an upstream oil and gas industry perspective.

4.1 Background

Global population and economic activity are projected to expand in coming decades, particularly in developing countries, as they aspire to meet a variety of economic and social development goals. Although uncertainty exists around the projected future level of emissions, in the absence of emissions constraints, projections indicate

atmospheric greenhouse gas concentrations will rise significantly. There are several noteworthy publications that examine the science and economics of climate change, including the Intergovernmental Panel on Climate Change's (IPCC)[25] various assessment reports, the International Energy Agency (IEA) *Energy Technology Perspectives*[26] and numerous other energy reports, the *Stern Review of the Economics of Climate Change*[27] and the *Final Report of the Garnaut Climate Change Review*[28].

Greenhouse policies will have far reaching implications for all energy producers and users. Some governments have already imposed some form of policy designed to mitigate the growth in greenhouse gas emissions.

As is well understood by the upstream oil and gas industry, measures introduced to date by the Australian Government and state/territory governments are already imposing a net carbon cost on the Australian economy, even before the proposed domestic emissions trading scheme is introduced.

In providing a signal that greenhouse gas emissions result in negative externalities, emissions of greenhouse gases are priced either explicitly or implicitly, and the cost of emitting activities rises. The policy instruments used for this purpose can be both efficient and inefficient.

For example, the current and proposed to be expanded mandatory renewable energy target (RET) represents an inefficient approach that leads to the imposition of a higher implicit price on carbon than would result if the same level of abatement were to be achieved using a more efficient instrument.

Regardless of the instrument used the end result is an increase in production costs (to a greater or lesser extent depending on whether or not the scheme accounts for the impacts on trade-exposed industry in Australia, an issue considered in further detail below) for emissions intensive industries, part of which will be passed through to consumers as higher prices for final products, and part of which will be borne by the producers themselves (subject to the relative elasticities of supply and demand, of which, for upstream oil and gas industry, the degree of trade exposure is a key determinant). Higher costs typically translate to lower demand, unless cleaner, less expensive methods of production can be found.

Substantial changes in technology will be required to stabilise atmospheric greenhouse gas emissions at a level that, consistent with the United Nations Convention on Climate Change (UNFCCC)[29], "would prevent dangerous anthropogenic interference with the

[25] See www.ipcc.ch for further information.
[26] See www.iea.org/Textbase/techno/etp/index.asp for further information.
[27] See www.sternreview.org.uk for further information.
[28] See www.garnautreview.org.au for further information.
[29] See www.unfccc.int for further information.

climate system ", while still allowing countries to meet their development goals.

A strategy of technology development will be necessary but will need to placed within a broader framework including end-use energy conservation, emissions limitation from non-energy sources and adaptation to climate change[30].

The degree of technological change that will be required over the timeframe involved is significant. A mix of policies will be required to assist this process and policy stringency will likely need to increase over time to meet the challenge of stabilising greenhouse gas concentrations in the atmosphere. A requirement for large reductions in emissions and relatively rapid change in technology would necessitate a fundamental shift in the global energy system.

To mitigate the cost to society of greenhouse policies, a steady transition to cleaner production methods should be facilitated, to prevent the bulk early retirement of existing capital stock. As such, climate change is a global, long-term, problem that requires a global solution, but one with clear implications for current investment and policy decisions.

As has been noted[31], it is unlikely that a comprehensive international agreement to support a global emissions trading scheme will emerge in the near future. It seems likely, however, that individual countries, or groups of countries, could implement emissions trading schemes. The result of this would be a 'constellation' or 'patchwork' of different national and regional schemes, with hopefully an open-door policy for new countries and regions to 'opt-in'.

It remains the case, however, that the lack of overall global agreement must be accommodated within domestic policy design.

4.2 An assessment of emissions trading schemes: key upstream oil and gas industry views

Many possible criteria may be used to assess the greenhouse policy instruments, including their environmental effectiveness, cost effectiveness, administrative and political feasibility, distribution considerations, government revenues, wider economic effects and effects on technical progress.

The basic principles for judging 'good' greenhouse policy advocated by APPEA as the basis for assessing greenhouse policy responses, such as an emissions trading scheme, are:

[30] The role of each of these measures is considered in more detail in the APPEA *Greenhouse Response Strategy*.
[31] The Australian Government has itself recognised that *"... reaching a comprehensive and ambitious global agreement will be tough ..."* (see www.climatechange.gov.au/whitepaper/foreword.html)

- economic efficiency;
- environmental effectiveness; and
- equity.

The following considers how these principles apply from an upstream oil and gas industry perspective.

Economic efficiency

- competitive and economic distortions should be minimised through comprehensive sectoral and geographic coverage at a global level and by allowing temporal flexibility in policy design. In particular, distortions between energy sources (particularly those that disadvantage gas) should be removed;
- any revenue raised from greenhouse policies should be recycled with a preference for measures that promote economic efficiency and investment in low emissions technology;
- market-based solutions should be preferred over 'command and control' mechanisms;
- the evolution of greenhouse policy should depend on what is learned over time about the magnitude and impacts of climate change and be capable of adjustment in line with evolving scientific evidence;
- administrative costs should be minimised by avoidance of complex policy design;
- emissions mitigation and CCS can have equivalent effects on the climate and therefore should be encouraged; and
- greenhouse policy should incorporate both mitigation and adaptation components.

Environmental effectiveness

- a well-defined process is required to ensure that emission abatement is undertaken in all countries, including developing countries, if the aim is to stabilise the concentrations of greenhouse gases in the atmosphere;
- greenhouse policies should recognise the unique nature of natural gas as a competitive low emissions technology source able to provide a significant and immediate greenhouse benefit to Australia and the region; and

- policies should not encourage the leakage of emission intensive production to regions with less stringent emission abatement policies.

Equity

- policy settings should avoid net windfall gains accruing to countries or within countries. Efforts should also be made to avoid unintended outcomes; and

- policies should facilitate the application and deployment of best practice and cleaner technologies, particularly gas-related technologies, across countries or sectors within countries.

In this section, an overview is provided of the relative strengths and weaknesses of emissions trading schemes, based on these main principles (without any attempt at prescribing the weighting that should be placed on each).

4.2.1 Economic efficiency

Emissions trading schemes (and potentially emissions taxes) are generally superior to regulatory standards in achieving cost-effective abatement insofar as they provide more flexibility to firms to achieve given reductions.

Most publicly discussed proposals for emission abatement schemes, including in Australia, are cap-and-trade emissions trading schemes. A cap-and-trade scheme is, however, not the only form an emissions trading scheme can take. These alternatives are considered further below.

4.2.2 Environmental effectiveness

Environmental effectiveness refers to the effectiveness of the instrument in question in achieving the desired environmental outcome – in this particular case, a reduction in the level of greenhouse gas emissions.

As this criterion is in part also dependent on the ability of the instrument to promote technical progress and diffusion of technology that leads to greater abatement, the effectiveness of the instruments in promoting such technological developments is also important (this is noted in Item 1(e) of the Inquiry's terms of reference). In this respect, it is worth distinguishing between impacts of the instrument in promoting:

- behaviour that can lead to immediate cuts in emissions, for example by drawing existing technologies "off the shelf";

- innovation and investment in technology that leads to ongoing further abatement; and

- diffusion of innovations that lead to further abatement.

Depending on design, an emissions trading scheme may provide price signals to induce changes in current behaviour as well as future innovation and technology diffusion resulting in ongoing abatement. Any revenue generated by the scheme could potentially be hypothecated to fund R&D expenditure on and deployment of emissions reducing technology.

From a dynamic efficiency perspective, emissions trading scheme may be superior to other instruments in encouraging investment in R&D for new technologies. This is because, as is considered further below, the necessary innovation incentives may be absent if sovereign risk is sufficient an issue that investors believe that the tax may eventually be withdrawn or lowered.

Scope and coverage are important elements of environmental effectiveness. The wider the scope in terms of regional coverage of emissions and coverage in terms of sectors and gases, the more effective the instrument. If international coverage were achieved under an emissions trading scheme, this would facilitate emissions reductions taking place wherever abatement costs were lowest, regardless of international borders. A well designed emissions trading scheme with universal coverage would have the benefit of 'when', 'where' and 'how' flexibilities and emission reductions would potentially be supplied from lowest cost sources.

4.2.3 Equity

Emissions trading schemes can have equity considerations that are difficult to overcome vis-à-vis taxes – for example, whether allocations are based on past emissions or population is a relevant question in an international context where developing countries are involved.

4.2.4 Other considerations

Emissions trading schemes are likely to involve relatively high (compared to an emissions tax, for example) administrative costs. Emissions trading schemes may be complex to establish and administer and initial permit allocation can prove contentious regardless of how they are allocated. This is certainly the case in Australia at present, with the proposed emissions trading scheme suffering from a number of shortcomings in this respect. These will be considered further below.

They are also typically time-consuming in the negotiation phase, to settle on arrangements agreed by all parties to the scheme. Emissions trading schemes will also involve wealth transfers to service providers

associated with the scheme (legal advisers, market operators, verifiers, and so on).

Hybrid schemes (such as the McKibbin-Wilcoxen Blueprint, considered below) may partially address this by minimising the level of international agreement with respect to individual caps. However, under this type of scheme, the international 'safety valve' must still be agreed.

In addition, emissions trading schemes may, depending on the design parameters, entail transaction costs including search, negotiating, approval and insurance costs compared with an emissions tax that would be integrated into existing tax collection systems.

4.3 A summary of the key design features of emissions trading schemes: key upstream oil and gas industry views

Emissions trading schemes can potentially take many forms and there is significant room for variation between schemes in terms of their design. The domestic emissions trading scheme proposed in Australia (referred to by the Australian Government as the Carbon Pollution Reduction Scheme) is one, but not the only, example. There are a number of emissions trading schemes operating around the world[32]. For example, the European Union Emissions Trading Scheme (EU ETS)[33] came into effect on January 1 2005. The EU ETS represents the world's first large scale emissions trading scheme. Transactions under the EU ETS currently dominate the global carbon market. In addition, a number of schemes, most importantly including in the United States, are under consideration.

Economic theory suggests that emissions trading schemes (and for that matter, emissions taxes) will impose less 'cost' than regulation. Since emitters have the option to decide under an emissions trading scheme their least cost method of abatement, direct regulation (in the absence of perfect information on the part of governments) that seeks to achieve the same emission reduction will always be more costly. The greater the difference in marginal abatement costs between firms, the greater the potential cost saving associated with emissions trading vis-à-vis regulation.

Given that capital assets in the upstream oil and gas industry typically have very long lives, to credibly influence technology pathways any trading scheme needs to signal a long-term goal for emission reductions and possibly a proposed emissions reduction pathway.

While an emissions trading scheme may offer some stability to guide investment decisions and assist in bringing forward the uptake of near

[32] See PricewaterhouseCoopers (2007), *Building Trust in Emissions Reporting Global Trends in Emissions Trading Schemes*, February, (available at www.pwc.com/extweb/pwcpublications.nsf/docid/8df4237f6b2f7fcf8525728300503b70) for an overview of a number of these schemes.
[33] See ec.europa.eu/environment/climat/emission.htm for further information.

commercial technologies, the degree to which it might encourage investment in R&D in new technologies and deployment of next generation low emissions technologies is the subject of debate. It has been argued, for example, that the scheme may fail to provide the necessary innovation incentives if it fails to send a credible, effective and durable signal to innovators.[34] This is a standard issue of sovereign risk, but compounded by the long lead times associated with technology innovation, development and deployment.

In addition, the scheme design needs to maintain enough flexibility to allow for the emissions reduction pathway to be adjusted in light of new scientific information about climate change as it becomes available.

4.3.1 The treatment of trade-exposed industries under a domestic greenhouse policy response: the role of LNG as a cleaner global contributor

As has been considered and accepted by every major credible analysis of an emissions trading scheme undertaken in Australia and internationally, if policies and measures such as emissions trading schemes are implemented in some countries and not in others, there are distortions that can occur as a result of the escalation in production costs in the countries that have implemented greenhouse policies relative to those that have not.

APPEA has long recommended measure(s) to deal with this international policy distortion impacting on trade exposed industries must be a central feature of any emissions trading scheme introduced in Australia.

In doing so, it is important to recall why the trade-exposed industries issue arises at all –that is, the failure of Governments to reach a global agreement on carbon pricing and the consequent implications for industry competitiveness that arise from unilateral actions by any one Government.

With that in mind, the industry's key objective in considering this issue is to ensure that the Australian LNG industry, as one of Australia's key trade-exposed industries, does not bear an additional cost impact for as long as our competitors and customers are not subject to a similar impost.

The importance of this issue cannot be underestimated: a domestic emissions trading scheme would be highly prejudicial to Australia's economic performance without a provision to preserve industry's international competitiveness.

[34] Montgomery, W D and Smith, A E (2005), *Price, Quantity, and Technology Strategies for Climate Change Policy*, CRA International, 11 October (available at www.crai.com).

For a number of reasons that will be considered further below, the proposed Australian scheme (as outlined in the package of legislation released on 10 March 2009) fails to achieve this outcome and requires significant amendment.

APPEA acknowledges that the Government, through the White Paper, has taken steps to clarify the impact of the proposed emissions trading scheme on Australia's LNG industry. This means that provided it meets the criteria set out in the legislative package released in March 2009, LNG may qualify for an administrative allocation of permits to cover up to nominally 60 per cent of emissions in the first year of the scheme's operation.

It remains the case, however, that the industry will be subject to a significant cost burden that is not borne by its LNG competitors[35] or customers. Reducing the international competitiveness of Australia's LNG industry will lead to growth prospects being constrained and a likely commensurate increase in global emissions as developing countries continue to expand their use of more carbon intensive fuels.

In this context, arguments that the industry can "afford to pay" that have been raised by some[36] are economically naïve and fail to recognise the range of factors that influence investment decisions in the Australian LNG industry. Discussions around a perceived capacity to pay convey an unfounded confidence that companies with multiple global investment choices will invest in new Australian LNG projects. Carbon costs of the kind illustrated implied by the Scheme would represent a substantial addition to operating costs and a substantial reduction in profit margin.

Most importantly, with competitors not facing comparable costs, the decision about which project proceeds next and whether a particular project proceeds at all, may be affected. The omitted or deferred investment funds would be spent elsewhere in the world, and no global emissions benefit would have been achieved.

Good policy design, whether it is an emissions trading scheme or any other greenhouse policy response, is not about profitability. Proposals that treat firms or industries differently based on profitability undermine the integrity of the overall scheme design. Designing an effective and efficient scheme is not reliant on and should not be reflective of industry profitability. Design of the scheme or of any relevant greenhouse policy response should be focused on the long-term viability of industries that would expand if a global emissions trading scheme were in place, not on the short-term profits over the course of a business cycle.

[35] Australia's LNG industry faces fierce global competition. Australia's major LNG competitors include Qatar, Algeria, Nigeria, Trinidad & Tobago, Egypt, Brunei, Indonesia, Malaysia, Oman and the United Arab Emirates.

[36] A recent example of this poorly considered argument can be found at www.climateinstitute.org.au/images/TCIeconomicscommitteesub.pdf.

APPEA noted in its submissions to the Carbon Pollution Reduction Scheme Green Paper[37], the Senate Select Committee on Fuel and Energy[38] and the Senate Standing Committee on Economics that it would be unfortunate if, by unnecessarily constraining Australia's LNG industry, the design of the emissions trading scheme were inadvertently to undermine the Scheme's ultimate objective of helping the world to reduce greenhouse gas emissions.

LNG has been characterised as an 'anomaly' within the design of a domestic emissions trading scheme. Although producing LNG is energy and emissions intensive and adds to greenhouse gas emissions in Australia, as was considered above, natural gas makes a substantial net contribution to reducing global greenhouse gas emissions. As the world inevitably shifts to a preference for cleaner burning fuels, the substantial strategic value of Australia's natural gas assets can only increase.

Realising the full economic and environmental potential of Australia's natural gas requires a commitment from both Government and industry to identifying and removing impediments to its development. LNG is a proven industry with significant and imminent growth prospects in Australia. The impact of this industry's growth on regional development and employment, as well as Government earnings is set to be substantial.

APPEA agrees with Professor Ross Garnaut[39] that a fundamental principle in designing a domestic emissions trading scheme in the absence of a global scheme must be to ensure that it produces similar production and investment outcomes to those reasonably expected under a global scheme.

APPEA was therefore disappointed that an important rationale for permit allocation to trade-exposed activities outlined in the Green Paper was subsequently removed in the White Paper and is not reflected in the objects of the recently released legislation. The third rationale for recognising these activities in the Green Paper was *"to support production and investment decisions that would be consistent with a global carbon constraint"*. This has been removed as a principle and transformed into a vague statement of expectation that this may be a partial consequence of treatment proposed in the White Paper. It is not reflected at all in the draft legislation.

Subjected to a global price of carbon, the international natural gas industry will expand, as a consequence of having 50 to 70 per cent

[37] APPEA's submission to the Carbon Pollution Reduction Scheme Green Paper can be found at www.climatechange.gov.au/greenpaper/consultation/pubs/0834-appea.pdf.
[38] APPEA's submissions to the Senate Select Committee on Fuel and Energy can be found at www.aph.gov.au/Senate/committee/fuelenergy_ctte/submissions/Sub0018.pdf, www.aph.gov.au/Senate/committee/fuelenergy_ctte/submissions/sub0018a.pdf and www.aph.gov.au/Senate/committee/fuelenergy_ctte/submissions/sub0018b.pdf.
[39] Garnaut, Professor Ross (2008), *The Garnaut Climate Change Review: Final Report*, 30 September (available at www.garnautreview.org.au).

fewer emissions when used in electricity generation compared to the coal alternative. Yet, the domestic scheme, as proposed, would see the industry's growth, growth that is both economically efficient and environmentally effective, constrained[40].

The LNG industry can think of no explanation for a design that results in a cost burden for an Australian industry that is poised for growth precisely because of the world's desire for less greenhouse gas emitting sources of energy. Inadvertently, it could send a message that Australia is unconcerned that this growth, and all the environmental, economic and social benefits associated with it, will occur, instead, in those LNG producing countries with which we compete. It is certainly inconsistent with the objectives implied by the Inquiry's terms of reference.

The case for the industry not to be exposed to any cost associated with a domestic emissions trading scheme while ever our competitors and customers (with cheaper, higher emitting energy choices available) are not subject to similar imposts is compelling.

Clearly, significant amendments to the proposed scheme are required to provide an efficient and effective greenhouse policy response that appropriately recognises the domestic contribution of natural gas and the global contribution of LNG exports.

APPEA recommends that any greenhouse policy response introduced in Australia, such as that contained in the draft *Carbon Pollution Reduction Scheme Bill 2009*, ensure the LNG industry does not face any cost associated with a domestic emissions trading scheme while ever our competitors and customers (with cheaper, higher emitting energy choices available) are not subject to similar imposts.

- This could be achieved, for example, by ensuring an administrative allocation of permits of 100 per cent of direct ('scope 1') emissions and 100 per cent of permits needed to fully offset costs passed-through by non-trade exposed industry (typically in electricity prices, gas prices and feedstock prices).

- This allocation should be maintained until Australia's LNG customers and competitors face similar imposts.

- Permit allocation should be made to existing operations based on fixed relationships between output and direct emissions and non-trade exposed cost pass-through measured in a typical recent year or average of years.

[40] Arguments have been made that a lack of investment in LNG would be made up by investments in other parts of the economy and that permit allocations to LNG would "crowd out" this other investment. Such a view is misinformed. As noted above, it is economically efficient and environmentally effective for LNG to grow under a global carbon constraint. The lack of appropriate treatment for LNG under the Bill will result, in fact, in less efficient investment "crowding out" LNG investment, to the detriment of both the Australian economy and the global environment.

Analysis prepared for APPEA by Access Economics[41], shows that providing a 100 per cent permit allocation will result in the continued growth of the LNG industry in Australia and a reduction in the growth in global emissions. It shows that, in all cases analysed[42], the economic growth benefits of an expanding LNG industry outweigh any costs associated with the permit allocation.

In addition, providing permits to the LNG industry does not 'shift the burden' onto other sectors of the Australian economy, as has been argued by some. The LNG industry is unique in that it exports *100 per cent of its relevant production*. This makes LNG unique in an economic sense, in that all relevant production takes place domestically but is consumed in foreign markets. As such, the LNG industry does not fit with standard economic analysis that has been applied to this issue in the public debate.

There are two elements to 'burden shifting':

- firstly, when the carbon price of the good is passed onto consumers and downstream industries (without compensation); and

- secondly, the incentives of the industry in question – LNG, in this case – to undertake abatement measures.

On the first point, the North West Shelf and Darwin LNG facilities and the other export facilities under consideration have no domestic consumers, either industry or households. If you have no domestic consumers higher costs are not passed to domestic consumers. No other sector will be asked to carry a heavier burden in terms of paying a higher price should permits be administratively allocated to LNG.

On the second point, whether or not permits are administratively allocated or through auctioning the LNG industry has the same incentive to reduce emissions. As will be considered further below, a permit that is administratively allocated has an opportunity cost – this means that the firm will make a decision on whether to acquit the permit or undertake abatement and sell the permit in the market. As the Government itself has noted in its Commentary to the draft legislation at paragraph 4.6 *"... the opportunity cost of each Australian emissions unit to a firm is the same ..."* regardless of whether they are allocated or purchased at auction or on the secondary market.

As APPEA noted above, it is important to recall why the trade-exposed industry issue arises at all – that is, the failure of Governments to reach

[41] Access Economics (2009), *Indicative costs and benefits of a LNG emissions costs offset*, January.
[42] The scenarios modelled were those used in the Treasury modelling report, *Australia's Low Pollution Future: The Economics of Climate Change Mitigation*, included the four scenarios modelled by the Treasury (known as "CPRS-5", "CPRS-15", "Garnaut-10" and "Garnaut-25").

a global agreement on carbon pricing and the consequent implications for industry competitiveness that arise from unilateral actions by any one Government.

It follows that an appropriate agreement that resulted in a comparable carbon cost facing Australia's LNG customers and competitors, would provide the solution to this issue. At that point, any treatment is rendered unnecessary. With that in mind, the Australian LNG industry has played an active role – since the early 1990s – in international forums to advance such an outcome. These include:

- providing, through APPEA's membership of AIGN, representation at each of the fourteen Conference of the Parties (COP) meetings held under the UNFCCC. With the exception of 2008, this has been as a member of the Australian delegation;

- participates in consultations, run by the Department of Climate Change, on the international negotiations and provides input, as appropriate, to the Australian Government's submissions to the UNFCCC[43];

- APPEA also participates directly in a range of climate change related international forums. For example, APPEA is a member of the Australian delegations to the Cleaner Fossil Energy Task Force of the Asia-Pacific Partnership on Clean Development and Climate (APP)[44] and to the Carbon Sequestration Leadership Forum (CSLF)[45]; and

- APPEA has participated in APEC Energy Working Group (EWG) considerations of international responses to climate change, including the December 2008 EWG meeting in Manila, The Philippines, that recommended, cognisant of international efforts such as the UNFCCC, the EWG conduct a survey of member economies' climate change policies and approaches to reducing greenhouse gas emissions including carbon pricing. Subsequently, the EWG should convene a follow-up workshop to share information on such policies and approaches and to report on the potential role of agreements on the reduction of greenhouse gas emissions in the energy sector within APEC[46].

4.4 A summary of the key design features of alternative greenhouse policy responses, other than an emissions trading scheme

This section provides an overview of greenhouse policy instruments, other than an emissions trading scheme. For the purposes of this

[43] See www.climatechange.gov.au/international/unfccc-submissions.html for more information.
[44] See www.asiapacificpartnership.org/english/tf_fossil_energy.aspx for further information.
[45] See www.cslforum.org for further information.
[46] See www.apec.org/apec/apec_groups/som_committee_on_economic/working_groups/energy.html for further information.

section, policies and measures are categorised into three broad groups:

- market-based mechanisms, including taxes on greenhouse gas emissions, and carbon and/or energy subsidies;
- regulations (including standards, bans and non-tradable permits); and
- voluntary agreements.

4.4.1 Emissions taxes

An emissions tax on greenhouse gases or CO_2 requires emitters to pay a specified tax, on each tonne of emissions released. Such a tax could be levied on CO_2 emissions only or on a weighted basket of gases using, for example, global warming potentials as the weights. A tax on greenhouse gas emissions will have a different impact from an energy tax.

While APPEA does not necessarily advocate the introduction an emissions tax, such a tax does provide a point of reference for the consideration of an emissions trading scheme and with that in mind, there are several important design features that need to be considered in the implementation of an emissions tax including the following:

- the choice of tax base is crucial because, among other things, a tax levied on the energy content of fuels will have very different and potentially much more costly implications than an emissions tax for the equivalent emissions reduction, since an energy tax raises the price of all forms of energy regardless of their contribution to emissions. An energy tax implemented in an attempt to reduce greenhouse gas emissions would be detrimental to the oil and gas industry because oil and gas have higher heat contents for a given level of CO_2 emissions compared with coal. Such a tax is likely to cause a serious distortion in energy markets if the aim is to reduce greenhouse gas emissions;
- any tax should be applied uniformly across sectors and regions. If such a tax is applied on one country but not in its major trading partners then, similarly to an emissions trading scheme that does not have universal coverage, it would be expected that there will be distortions in resource allocation between countries and that emissions intensive industries will tend to migrate to the countries with the lowest or no tax;
- government revenues from an emissions tax could be used to cut other taxes or to fund appropriate polices to fund low emissions technologies and associated R&D; and

- a tax system would need to be complemented by policies to support the sequestration of carbon to ensure the most efficient allocation of resources.

In theory, the efficient tax rate is the one equal to the marginal cost of "damage" avoided. Given that greenhouse gases are a stock measure, the efficient tax rate would equal the discounted stream of marginal impacts over time, taking into account the user cost of foregone future opportunities.

However, the numerous uncertainties associated with calculating such impacts make it practically impossible to accurately estimate the optimal tax rate. Even so, emissions taxes provide a mechanism for attempting to reflect the externalities associated with emissions, and provide a direct incentive for producers to reduce their emissions. The mechanism may have lower administrative costs than an emissions trading scheme.

The impact of the tax on emissions will depend in the short- to medium-term on the elasticity of demand for fuels and the elasticities of substitution between fuel sources. The higher the price elasticity and the higher the substitution elasticities, the more significant the impact on emissions. Given uncertainty about the marginal cost of abatement, an emissions tax is unlikely to guarantee a specified amount of abatement or achievement of a given environmental goal. A tax specifies the price of carbon with certainty but leaves the quantity of abatement to be determined by the market. If the goal is to achieve a specified reduction in emissions then it would be necessary to 'experiment' with the tax rate until the desired level of emissions reduction was achieved. This is clearly not a practical approach to taxation policy.

Emissions taxes may make existing low emissions technologies more cost competitive with conventional technologies, which in turn may increase their uptake. In this way, emission taxes may encourage demand for such low emissions technologies and 'pull' them into the market at an accelerated rate.

In a similar way to an emissions trading scheme considered above, while emissions taxes may offer some stability to guide investment decisions and assist in bringing forward the uptake of near commercial technologies, the degree to which emission taxes might encourage investment in R&D in new technologies is the subject of some debate.

In summary, an emissions tax is an instrument that could potentially be used to reduce greenhouse gas emissions but its use faces practical problems. In particular, to avoid international resource allocation distortions such a tax aimed at assisting with the mitigation of climate change should be internationally harmonised. Agreement to such

arrangements at the international level in the immediate future is highly unlikely.

4.4.2 Other market-based mechanisms to reduce greenhouse gas emissions

These mechanisms may take the form of direct payments or tax reductions, in return for each unit of CO_2 or other greenhouse gas reduced or sequestered. Such a measure provides a direct incentive to curb emissions producing activities or to implement technologies to reduce or sequester emissions.

A range of policies designed to improve the uptake of cleaner technologies may fall into this category. Rebates, price guarantees and tax credits are all ways in which governments could provide incentives to increase the supply of, or demand for, certain technologies. The government may reimburse or otherwise reduce the upfront costs, risk, ongoing maintenance or fuel costs of a particular investment.

There are several issues of interest in relation to use of such mechanisms:

- generally, they cannot guarantee that a particular level of emissions will be met because the cost of abatement is not known with certainty;

- if the government is to maintain budget neutrality, the expenditure on these mechanisms would need to be offset by increased taxation elsewhere in the economy or cuts in government expenditure, or both. Such changes may have both (negative and positive) efficiency and equity consequences;

- it would be most efficient to first remove subsidies (including preferential fiscal treatment) that produce distortionary effects and perverse outcomes, such as subsidies on energy sources. Removal of such distortions would have an immediate effect of altering the relative prices of different energy sources and is more economically efficient

    - in particular, Australia has a number of different tax regimes facing the various energy sources in Australia, with offshore gas taxed more heavily than competing sources, particularly coal[47]

[47] APPEA (2004), *NatGas: generating economic and social wealth for the nation now and in the future*, Canberra, February (see www.appea.com.au/content/pdfs_docs_xls/Publications/greenhouse/natgasfullreportfinal.pdf) and Nolan, M (2006), 'Energy Outlook: Challenges and Opportunities for Australia', Speech by Mr Mark Nolan, Chairman, ExxonMobil Australia to American Chamber of Commerce in Australia (AMCHAM), 6 April (see www.exxonmobil.com.au/Australia-English/PA/news_releases_20060406.aspx).

- this implies offshore gas could compete more effectively into domestic power generation on price if it was treated equally from a resource taxation standpoint

- the current system of fiscal arrangements between the State and Australian governments is therefore restricting competitive market forces and effectively pricing offshore gas out of competition for, in particular, base-load power generation

- APPEA acknowledges that there are some incentives for the use of gas in various parts of Australia. The Queensland Gas Scheme, for example, gives support to the exploration and development of gas within the State and this flows through to direct investment in gas-fired power stations in Queensland. This measure has also been successful in promoting coal seam gas in Queensland[48]; and

- renewable energy sources in Australia are the recipients of various forms of subsidies not available to gas

  - the key subsidy is the expanded national Renewable Energy Target (RET) scheme[49], that will aim to ensure 20 per cent of Australia's electricity supply comes from renewable energy by 2020. It will do this by increasing the existing Mandatory Renewable Energy Target (MRET) by more than four times to 45,000 gigawatt-hours in 2020. The scheme is currently under development

  - in addition, there is the presence, in a number of individual jurisdictions of forms of renewable energy related "feed in tariffs", that provide an above market rate for renewable energy producers and thus subsidise renewable energy generation and raise electricity prices for all consumers[50]

  - there are also, at an Australian Government level, numerous additional programs exist to subsidise renewable energy[51]. Each State and Territory similarly has numerous grant and other schemes to subsidise renewable energy production

  - the schemes are variously justified by their purported greenhouse and industry development benefits. However, the schemes also act to provide a significant disadvantage to gas as a competitive fuel source for electricity generation, artificially distorting the electricity market and inappropriately penalising gas, and inefficiently reducing the contribution it can

[48] See www.dme.qld.gov.au/Energy/gasscheme.cfm for further information.
[49] See www.climatechange.gov.au/renewabletarget/index.html for further information.
[50] All Australian jurisdictions have, or are examining, feed-in tariffs. See www.coag.gov.au/coag_meeting_outcomes/2008-11-29/docs/20081129_national_principles_fits.pdf for further information.
[51] See, for example, www.climatechange.gov.au/renewabletarget/index.html and www.ret.gov.au/energy/energy%20programs/Pages/EnergyPrograms.aspx for further information.

make to lowering the carbon signature of power generation in Australia.

4.4.3 R&D expenditure

Direct expenditure on R&D may be used to enhance incentives for innovation in cleaner energy technologies. The primary objective of higher R&D expenditure is to increase the supply and development of new low emissions technologies and reduce supply prices.

Governments may have an important role in providing R&D funding if the level or scope of private R&D expenditure is socially suboptimal. Government funding for R&D can support both basic and applied R&D through budget allocations and project funding for both private and public research institutions. Current Australian Government arrangements include the R&D Tax Concession and similar programs, funding for the CSIRO and funding of the Cooperative Research Centre (CRC) program.

There are many forms that additional R&D expenditure may take, including cash prize(s) (prizes awarded for significant R&D progress in the private sector), grants (funds awarded for research and development as either a single payment or distributed over time) and demonstration (where government provides monetary support or facilities for the demonstration of new technologies).

4.4.4 Tax depreciation rates

Changes to tax depreciation rates may represent a cost effective way to encourage the development of low emissions projects and technologies, such as major gas projects and CCS technologies.

4.4.5 Regulations

Regulations are typically prescribed to help overcome institutional deficiencies, to address market failures or deal with informational barriers. Regulations may be used to set targets or emission limits for specific technologies, specific sectors, or for the economy as a whole. They may also be used to ban certain products or processes that are considered to generate too many emissions.

Regulations are one way of addressing environmental thresholds (subject to the ability to enforce the regulation) where it is believed that emissions must not exceed a given level. Of course the same outcome could be achieved by using an emissions trading scheme, subject to the government's ability to enforce the cap.

There are numerous examples of international regulatory agreements that attempt to address environmental issues. Several types of regulations are available to reduce greenhouse gas emissions. The

most widely used are: technology or performance standards, targets, product bans, and non-tradable permits.

Standards

Standards may apply to specific technologies, sectors, or the economy as a whole. They may set a limit on total emissions permissible from certain activities or sectors, mandate the use of a specific technology type within a certain timeframe, or lay out a time horizon in which firms must achieve industry best practice.

By implementing a limit on emissions from certain activities, or requiring the use of particular technologies with specified characteristics, the government imposes additional costs on the economy. The marginal cost of a standard typically increases with the stringency of the standard imposed. The costs associated with standards will depend directly on the cost of the technology and/or process modifications that are required to meet the standard, and on the timeframe in which the regulation must be met. The longer the lead time in enforcing the standard, the lower the likely adjustment cost. This is because the long life time of capital stocks implies that the least costly way to affect emissions is when new investment decisions are being made.

Bans

Bans may be placed by government on products, technologies or production processes considered to be harmful. Product bans are typically exemplified by an outright prohibition on harmful substances, phased in over a specified period of time, with penalties in place for breaches.

The imposition of product bans may have competition distorting effects if one region or nation imposes such regulations unilaterally and/or if several nations implement bans while their international competitors do not. This may lead to shifts in competitive advantage if there are no ready substitutes for the banned product in some production processes and/or if the substitutes result in higher production costs. Distortionary effects may also occur if some activities or firms are exempted from the ban while others are not.

Non-tradable permits

Non-tradable permits can be used to establish limits on carbon or greenhouse gas emissions, typically at the firm level. Permits are allocated to emitters to keep their individual emissions below the allocated level. Penalties are imposed for emissions beyond the allocated level.

A major downside of non-tradable permit schemes is that they are inflexible with respect to where and how emissions are abated and are therefore inefficient.

4.4.6 Voluntary agreements

Voluntary agreements are typically arrangements between the government and a private firm, group of firms, or industry, to commit to environmental controls, best practice technologies or technology R&D in excess of legal requirements. They may also take the form of a unilateral commitment recognised by the government to achieve a certain environmental target. Voluntary agreements involve voluntary participation but may or may not involve enforceable commitments.

Voluntary agreements are potentially more politically palatable than many other instruments due to their non-coercive, consensus based nature.

Technology agreements

Voluntary agreements with respect to technology warrant specific mention. This type of agreement relates specifically to technology research and development, demonstration, deployment, diffusion and/or transfer.

The best example of an existing voluntary technology agreement applicable to climate change policy is the Asia-Pacific Partnership on Clean Development and Climate (APP). APPEA supports the APP and is working with the Australian Government on priorities for action for natural gas through its involvement in the APP Cleaner Fossil Energy Task Force[52]. This work has focussed on the market conditions for natural gas supply in APP Partner countries and the market and regulatory reforms that could allow natural gas to play its full role in achieving the APP's objectives of lowering greenhouse gas emissions, lowering pollution and enhancing energy security and economic growth[53].

Technology agreements could become a key mechanism for international cooperation in the future because they provide a means to engage key developing country emitters in discussions with respect to emissions control within a context that accounts for growth and development goals.

4.4.7 Hybrid proposals and safety valves

The McKibbin-Wilcoxen Blueprint[54] is an example of a 'hybrid' scheme that proposes an internationally coordinated system of national

[52] See www.asiapacificpartnership.org for further information.
[53] See and for further information on CFE-06-08, the *Asia-Pacific Gas Market Growth Project*.
[54] For example, McKibbin, W. and Wilcoxen, P. (2006), *A credible foundation for long term international cooperation on climate change*, Lowy Institute for International Policy. See www.wjmckibbin.com/publications.htm for a full list of papers detailing the Blueprint.

emissions permits and fees. Under this proposal, all emitters are required to own permits equal to their total emissions. Countries participating in the scheme may distribute a specified number of perpetual permits to their domestic users in any way. These perpetual permits are distributed once only and are limited in supply to achieve a certain level of emissions. They can only be used in the country of issue and cannot be traded internationally. Domestically however they may be bought, sold or leased without restriction. Additional, unlimited annual permits may be purchased from the government for a stipulated international price.

This 'safety valve' approach to emissions trading is a way of preventing the permit price from exceeding a pre-determined benchmark. A safety valve can be implemented by allowing the issuing authority to sell as many permits as demanded at the benchmark price. That is, the supply of permits at the benchmark price is unlimited, which means that the market price cannot exceed the predetermined benchmark price.

The attractiveness of the safety valve is that – theoretically – the benchmark price can be set equal to the marginal benefits of abatement (provided that the level of marginal benefits can be established). If the marginal benefit of reducing emissions remains constant but the marginal abatement costs increase, then allowing more emissions than those implied by the initial cap would be efficient, because marginal costs of abatement exceed the marginal benefits from abatement (meaning that less abatement is desirable, which in turn means that the allowed level of emissions should be increased).

A safety valve converts a cap-and-trade system into a hybrid quantity-price control scheme, because the safety valve, when activated, works like a price cap (in the sense that the price of emissions becomes fixed, while the quantity of emissions is allowed to vary). To make the safety valve operational, a benchmark price needs to be determined. The concept thus requires the possibility of releasing an unspecified number of permits if the permit price approaches the safety valve. Such a requirement may encounter international negotiating challenges because of the uncertainty this introduces in terms of meeting a specified emissions reduction trajectory.

Overall, the proposal provides a building block for a hybrid policy designed to deal with both international and domestic issues. It provides:

- potentially greater investment certainty by capping through the safety valve the cost of abatement;

- a source of revenue which could be used to fund R&D into low emission technologies; and

- a way to deal with trade competitiveness impacts by establishing a consistent international benchmark price.

4.4.8 Consumption-based trading or tax approaches

Most cap-and-trade proposals, including the Australian proposal, focus on pricing emissions associated with the production of goods and services. Geoff Carmody, Director, Geoff Carmody & Associates[55] has proposed as an alternative a consumption-based scheme that, for the period of transition to a comprehensive global agreement (and beyond), would ensure trade neutrality for countries that take on emission reduction commitments earlier than others. China has also noted recently the potential for a consumption-based approach[56].

In essence, the scheme ensures that:

- all exports are rebated emission costs, both direct costs and emission costs embodied in inputs. An importing country would be free to impose an emissions charge at the same rate as it imposes on a domestic equivalent; and

- all imports are assigned an emissions cost at the same *ad valorem* rate as the equivalent domestic product. That is, at least initially, imports are assumed to have the same emission intensity as domestic production.

The key to the proposal is that it is trade neutral in the same way as is the goods and services tax (GST) and it can piggy-back on existing GST systems for implementation.

4.4.9 Intensity-based approaches (an output based allocation cap-and-trade scheme)

An intensity-based approach to emissions reductions are under consideration in a number of countries, including Canada, Japan and South Korea.

A proposal for an Australian intensity-based approach has been outlined by Frontier Economics[57]. Under this approach, the Government would set an emissions intensity target – a 'benchmark' for each sector/ industry/ activity. These benchmarks can be set to achieve any given emissions abatement target.

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[55] Geoff Carmody, *On Line Opinion* (available at www.onlineopinion.com.au/author.asp?id=5613).
[56] See www.spiegel.de/international/world/0,1518,611818,00.html for further information.
[57] See, for example, Frontier Economics submission to the Garnaut Climate Change Review (available at www.garnautreview.org.au/CA25734E0016A131/WebObj/D0850872ETSSubmission-FrontierEconomicsPtyLTD/$File/D08%2050872%20%20ETS%20Submission%20-%20Frontier%20Economics%20Pty%20LTD.pdf) and to the Green Paper (available at www.climatechange.gov.au/greenpaper/consultation/pubs/0531-frontier-economics.pdf).

In essence, this approach would mean that:

- if liable entities have emissions intensity levels above the benchmark they have to acquit permits to account for 'excess' emissions; and

- if liable entities have emissions intensity levels below the benchmark they are 'rewarded', by having permits available to sell.

Permit allocations under this approach are contingent upon production is much the same way as is proposed in the domestic emissions trading scheme.

Claimed benefits from this approach include:

- the absolute price effect is smaller;

- the amount of revenue 'churning' inherent in the current domestic emissions trading scheme is greatly reduced;

- moving to such an approach involves relatively minor changes to the proposed domestic emissions trading scheme; and

- such an approach is compatible with other international trading schemes.

5. THE RELATIVE CONTRIBUTIONS TO OVERALL EMISSION REDUCTION TARGETS FROM COMPLEMENTARY MEASURES

The Inquiry's terms of reference at Item 1(b) includes consideration of the relative contributions to overall emission reduction targets from complementary measures.

This section sets out the APPEA's view on aspects of these issues, noting number of relevant views have already been set out in Section 4.

In addition, it does not comment on a domestic emissions trading scheme (relevant issues have already been considered above) but rather on other measures that might exist and the potential for rationalising the myriad of costly greenhouse measures that exist across all Australian jurisdictions.

5.1 Complementary measures

As was noted, APPEA recognises that a comprehensive greenhouse policy framework requires a portfolio of measures, some of which may complement an emissions trading scheme and others of which are justified in their own right.

The key programs/policy areas for APPEA include:

- removal of regulatory impediments to the greater use of gas in the national energy market –including via cogeneration and distributed energy uses; and

- appropriate investment incentives, such as those to support low emissions technologies. A national medium to long term technology strategy for the development and adoption of commercially viable low emission or greenhouse mitigation technologies is a critical element of the approach industry proposes. Such a strategy should take account of R&D activities being pursued by Australian operating companies in a global context. Research funded by industry and government might include:

  - CCS;

  - development of distributed energy technologies based on gas and also the development of technologies to allow their effective incorporation into the national grid;

  - use of high efficiency combined cycle turbines;

  - developing efficient end-use gas based technologies (for example, gas fuelled air conditioning); and

  - research into more efficient and cost effective pipeline construction technologies, gas processing and industrial processes.

  Australia should not seek to be the world leader in all of these areas. Rather, it should pursue a series of specific international bilateral and multilateral technology agreements where there are discernible benefits to all parties. Government needs to be careful to avoid trying to "pick winners" and should instead concentrate on setting the right policy framework to facilitate scientific and technological innovation and eliminate barriers to the adoption of suitable, commercially viable technologies.

  R&D into abatement technologies should be encouraged through funding and fiscal incentives and supported through policy. The pursuit of global corporate partnerships also potentially offers benefits in this regard.

5.2 The urgent need to rationalise existing climate change measures

The growth of separate Australian Government and State and Territory Government measures 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 sovereign risk, misallocation of resources and deadweight losses to the economy associated with the hotchpotch of climate change mitigation 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.

APPEA notes and supports the work underway through the Council of Australian Governments (COAG) to attempt to address some aspects of the need for a national approach. The COAG Principles[58] announced in November 2008 are an important step forward. It is vital that the rigorous application of these principles to an assessment and rationalisation of the separate Australian Government and State and Territory Government policies and greenhouse initiatives must be undertaken as a matter of urgency and involve independent assessment processes and stakeholder engagement.

Any introduction of an emissions trading scheme (or alternative policy) must be accompanied by a significant rationalisation of greenhouse measures across all Australian jurisdictions. 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. Indeed, such a rationalisation should be regarded as a necessary but not sufficient condition for the introduction of an emissions trading scheme. Under no circumstances should such a scheme merely be added to the hotchpotch of existing measures.

[58] Council of Australian Governments (2008), *COAG Principles for Jurisdictions to Review and Streamline their Existing Climate Change Mitigation Measures*, November (available at www.coag.gov.au/coag_meeting_outcomes/2008-11-29/docs/20081129_complementarity_principles.pdf).

ATTACHMENT 1: APPEA GREENHOUSE RESPONSE STRATEGY (AS AT NOVEMBER 2003)

APPEA
AUSTRALIAN PETROLEUM PRODUCTION & EXPLORATION ASSOCIATION LIMITED

GREENHOUSE RESPONSE STRATEGY

COMMITMENTS OF THE UPSTREAM OIL AND GAS INDUSTRY

PUBLIC POLICY RESPONSE: A GOVERNMENT/INDUSTRY PARTNERSHIP

(AS AT NOVEMBER 2003)

APPEA GREENHOUSE RESPONSE STRATEGY

APPEA, and its members, are committed to working towards a profitable, safe, environmentally responsible and socially responsible oil and gas exploration, development and production industry. As a part of this, APPEA wants to work with governments to achieve credible industry actions and governmental greenhouse policies that address greenhouse concerns in an economically and commercially viable way.

The Council of Australian Governments (COAG) recognises in its energy policy of 8 June 2001 that Australia will be dependent on fossil fuels to meet its energy needs for the foreseeable future.

It should be noted that gas as a fuel, particularly in power generation, can create improved emissions outcomes in Australia and that LNG exports can contribute to an improved global outcome. In that context, APPEA supports the removal of regulatory impediments to the increased use of gas.

In addition to commitments by the upstream oil and gas industry, APPEA is seeking to develop a public policy response that meets the needs of State and Commonwealth governments and fits within the following three components:

- immediate actions;
- medium term responses; and
- longer term policy principles.

COMMITMENTS OF THE UPSTREAM OIL AND GAS INDUSTRY

APPEA members:

- will continue to create and take opportunities for economic emission abatement and sequestration;
- are committed to continuous improvement in relation to both emission abatement and sequestration as new technology becomes commercial;
- support the Greenhouse Challenge Program to promote further emission abatement;
- will examine all commercially practicable options for improved energy efficiency;
- continue to work with customers to promote the efficient use of products; and
- are financing and participating in R&D into the geological disposal of CO_2 and will consider other opportunities for R&D into sequestration and emission abatement.

APPEA is ready to input into modelling work on greenhouse projections and to participate in dialogue as government develops policy to ensure that APPEA is part of the debate process and can help influence a least cost outcome for the industry and its major customers.

APPEA will take opportunities to brief all stakeholders, including environmental NGOs, on APPEA's position on greenhouse abatement.

PUBLIC POLICY RESPONSE: A GOVERNMENT/INDUSTRY PARTNERSHIP

Immediate Actions

APPEA believes all governments in Australia should adopt a nationally coordinated approach to greenhouse policies. State governments should not introduce policies and mechanisms inconsistent with a national approach. APPEA welcomes the commitment by State and Territory government leaders on 29 August 2003 to working with the Federal Government to achieve a national approach to this important issue.

Governments need to continue to recognise that greenhouse policies must allow Australian industry to maintain its international competitiveness. APPEA will work with government to develop ways to maintain international competitiveness in keeping with the Commonwealth Government's commitments to industry, including the *2000 LNG Action Agenda*. In this regard, the Government should take into consideration international developments and their implications for Australia in its policy formulation.

The impact of greenhouse policies on the industry's customers needs to be recognised as a critical test of the appropriateness of greenhouse policies. In addition, the commitment by the Commonwealth Government on No Disadvantage for Early Movers is essential in maintaining Australia's international competitiveness and keeping Australia attractive to investment.

Medium Term Responses

In the policy framework formulated by the Australian government, APPEA supports and advocates a four-point program for joint government/industry action to deliver a national approach to greenhouse gas emissions management which extends into the next decade and beyond. Technology alone will not provide the solution to long term reductions in emissions levels. APPEA will work with governments on other initiatives which reduce emissions cost effectively and maintain Australia's export competitiveness.

- The Association would argue that all initiatives proposed for inclusion in such a program must be exposed to a robust, independent assessment of their costs, community impacts and benefits before they are pursued.

APPEA supports the following 'foundation set' of four policy thrusts to facilitate the current and forward strategies for greenhouse gas management in Australia. The four key strategies are:

1) support for continued pursuit by Australia of an *international negotiation process* that meets the needs of Australia and also sets a path forward for comprehensive global action;

2) implementation of an *enhanced greenhouse impacts modeling program* directed at giving better information on climate impacts (variable, intensity, variability, timing, location);
3) implementation of a *mandatory national emissions reporting and verification system*;
4) development by Australia of a flexible portfolio of *emission abatement actions* incorporating:
   a. the retention and enhancement of some existing programs;
   b. a national end-use efficiency program;
   c. consideration of the development of appropriate administrative mechanisms or processes directed at giving industry greater certainty about greenhouse outcomes; and
   d. a strategy for the development and adoption of commercially viable low emission technologies.

Effectively:
- strategy 1 sets the long term policy context within which a flexible national approach will need to evolve. This would be progressively refined over time, e.g. as the role of the Kyoto Protocol became clearer and a better understanding is gained on (but to clarify this context we need to know whether Russia will ratify Kyoto and know how the post 2012 treaty negotiations, which commence in 2005, might evolve);
- strategies 2 and 3 will deliver an adequate factual data base to allow company and national responses to be properly formulated; and
- strategy 4 is an actions package.

An alternative way of viewing the strategies 2-4 is that:
- strategy 2 is about adaptation; and
- strategy 3 and 4 are about emission abatement.

Strategy 1: The International Commitment

Climate change is a global issue and requires comprehensive global agreement if it is to be effectively addressed. Development of effective international arrangements (whether multilateral or of another kind) must be a central part of any national policy approach. Where appropriate, Australia should continue to pursue bi-lateral and pluri-lateral agreements, particularly in relation to RD&D. APPEA (and/or its member companies) will participate in activities under international agreements, including:
- geo-sequestration work under the Bilateral Agreement with the USA;
- policy and technical work as part of the Carbon Sequestration Leadership Forum (for example a substantial body of work will be done over the next six to twelve months on global regulation of geo-sequestration);
- the promotion of natural gas as apart of the APEC energy work (helping us to develop LNG market opportunities); and
- promotion of zero emission technologies by international agencies such as the International Energy Agency and the World Bank.

- The development of effective international arrangements should be aimed at achieving the least-cost outcome for Australia and the global community. Above all, it is the reduction in net global emissions of greenhouse gases that is important and international agreements should reflect this.

Strategy 2: The Adaptation Commitment - Enhanced Greenhouse Impacts Modeling Program

Once adequate location specific data on potential impacts of climate variability are available, APPEA member companies will, as appropriate, review (and if necessary adapt) their risk management strategies (encompassing engineering design, safety and environmental assessments) to reflect new learnings on the likely impacts of climate variability). Government will also need to complement industry action by developing risk management strategies in areas such as health care, water supply, emergency services and suitable developments in coastal areas and on flood plains. This sort of action planning should give the community greater confidence about how the greenhouse issue is being addressed.

Strategy 3: Mandatory Emissions Reporting

A mandatory national emissions reporting and verification system should be developed. The methodologies and tools for this should be consistent with the Greenhouse Challenge Program objectives and internationally recognised emission estimation methodologies. This would be applicable to all organisations/facilities emitting over an agreed threshold. A lower threshold could potentially be phased in over time.

Without an adequate emissions database/emissions inventory, companies cannot calculate the likely impact of particular policies on their bottom line and government can't adequately develop well targeted and effective policies. Both government and industry get better information on the cost and difficulties of assembling credible data that will meet commercial and policy integrity requirements.

Strategy 4: The Development of a National Portfolio of Emission Abatement Actions

(a): The Australian Government must act to ensure efficient continuation of a number of existing programs to encourage industry and government instrumentalities to continue to take all commercially practicable measures to abate emissions. The continuation of these programs is essential, particularly in meeting the 108 percent objective, but also in laying the foundation for two of the other vital elements of the Abatement Package proposed by APPEA, namely administrative mechanisms or processes and a comprehensive national end-use efficiency program designed to achieve a cost-effective, world-class approach to efficient energy use.

The key programs/policy areas for APPEA include:

- the Greenhouse Challenge Program – APPEA is committed to continuing to be an active participant in this program;
- removal of regulatory impediments to the greater use of gas in the national energy market – including via cogeneration and distributed energy uses; and
- investment incentives, such as an enhanced version of the Greenhouse Gas Abatement Program (GGAP).

It must also be recognised that there must be an equitable share of the abatement across the economy and not merely targeted at any particular industry. As such, continuation of programs targeted at end-use efficiency and land use measures, including cessation of land clearance, constraint of urban sprawl and re-vegetation programs, are an integral component of the portfolio of abatement actions.

(b): An end-use efficiency program would focus on efficiency on both the demand and supply side. In particular, it would require a strong focus on use at the household and small business level. Further, it would need to look at appropriate cogeneration and distributed energy technologies. In many instances, outcomes may best be achieved through investment incentives. While there is a requirement for new programs to address end-use efficiency, there are a number of programs that are already in operation, but these would need to be expanded. These include:

- enhanced building codes; and
- an energy efficiency labeling programs.

(c): Taking into account relevant global experience, consider a range of appropriate and flexible administrative mechanisms or processes to encourage additional cost effective reductions in greenhouse gas emissions. Such programs should be consistent with commitments given to industry in the *2000 LNG Action Agenda*. They should give both industry and government greater certainty about greenhouse outcomes and allow governments to commit to 'no disadvantage' for early movers in greenhouse emission abatement. The mechanisms or processes should be designed to encourage industry to employ new approaches, both technical and commercial, which result in reduced emissions.

(d): A national medium to long term technology strategy for the development and adoption of commercially viable low emission or greenhouse mitigation technologies is a critical element of the approach industry proposes. Such a strategy should take account of research and development activities being pursued by Australian operating companies in a global context. Research funded by industry and government might include:

- geo-sequestration of carbon dioxide (underway via CO2CRC);

- development of distributed energy technologies based on gas and also the development of technologies to allow their effective incorporation into the national grid;
- use of high efficiency combined cycle turbines;
- developing efficient end-use gas based technologies (e.g. gas fueled air conditioning);
- further development of fuel cell technology;
- implementing outcomes of the national hydrogen study;
- research into more efficient and cost effective pipeline construction technologies, gas processing and industrial processes; and
- testing by industry of the commercial practicality of developing electricity generation based on hot dry rocks, which depend on petroleum industry related technology.

APPEA would argue that Australia should not seek to be the world leader in all of these areas. Rather, it should pursue a series of specific international bilateral and multilateral technology agreements where there are discernible benefits to all parties. Government needs to be careful to avoid trying to "pick winners" and should instead concentrate on setting the right policy framework to facilitate scientific and technological innovation and eliminate barriers to the adoption of suitable, commercially viable technologies. Research and development into abatement technologies should be encouraged through funding and fiscal incentives and supported through policy. The pursuit of global corporate partnerships potentially offers benefits in this regard (for example, to allow Australian researchers to tap into the development of components for hybrid cars or fuel cell technology).

Longer Term Policy Principles

APPEA believes that immediate and medium term responses should be flexible, least cost and consistent with development in the longer term of policies and measures which:

- will ensure efficient and effective market operations nationally and globally; and
- maintain the international competitiveness of trade exposed industries.

ATTACHMENT 2: AUSTRALIAN GOVERNMENT REPORT: *AUSTRALIAN LIQUEFIED NATURAL GAS (LNG) – CLEAN ENERGY FOR A SECURE FUTURE, JUNE 2008*