6 March 2009

Dr John Tamblyn
Chairman
Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

(via e-mail to: aemc@aemc.gov.au)

Dear Dr Tamblyn

RE: REVIEW OF ENERGY MARKET FRAMEWORK IN LIGHT OF CLIMATE CHANGE POLICIES: APPEA COMMENTS

The Australian Petroleum Production & Exploration Association (APPEA) represents the collective interest of the upstream oil and gas industry in Australia. APPEA member companies produce around 98 per cent of Australia's oil and gas. Further details on APPEA and its members and on the industry in Australia can be found at www.appea.com.au.

APPEA welcomes the opportunity to provide comment on the 1st Interim Report of the *Review of Energy Market Frameworks in light of Climate Change Policies*. APPEA is a member of the Review's Stakeholder Advisory Committee and this submission supplements APPEA's involvement in that Committee.

In addition, a number of APPEA members have made individual submissions to you commenting on the issues under consideration by the Review. APPEA commends these submissions to you.

APPEA would welcome the opportunity to discuss our submission with you at any stage. In the meantime, if you have any queries, please contact Mr Damian Dwyer, Director –Energy Markets & Climate Change on 6267 0902 or via e-mail at ddwyer@appea.com.au.

Yours sincerely

[Original signed]

Mark McCallum
DEPUTY CHIEF EXECUTIVE –POLICY & EXTERNAL RELATIONS

AUSTRALIAN PETROLEUM PRODUCTION & EXPLORATION ASSOCIATION LIMITED

ABN 44 000 292 713

HEAD OFFICE

GPO BOX 2201
CANBERRA ACT 2601

LEVEL 10
60 MARCUS CLARKE STREET
CANBERRA ACT 2600
PHONE +61 2 6247 0960
FAX +61 2 6247 0548

BRISBANE OFFICE

GPO BOX 1151
BRISBANE QLD 4001

LEVEL 9
10 MARKET STREET
BRISBANE QLD 4000
PHONE +61 423 592 722
FAX +61 7 3220 2811

PERTH OFFICE

PO BOX 7039
CLOISTERS SQUARE
PERTH WA 6850

LEVEL 1
190 ST GEORGES TERRACE
PERTH WA 6000
PHONE +61 8 9321 9775
FAX +61 8 9321 9778

INTERNET
www.appea.com.au

EMAIL
appea@appea.com.au

REVIEW OF ENERGY MARKET FRAMEWORKS IN LIGHT OF CLIMATE CHANGE POLICIES

1ST INTERIM REPORT

APPEA Comments

MARCH 2009

TABLE OF CONTENTS

1. INTRODUCTION

APPEA welcomes the opportunity to provide comment on the 1st Interim Report of the *Review of Energy Market Frameworks in light of Climate Change Policies*. APPEA is a member of the Review's Stakeholder Advisory Committee and this submission supplements APPEA's involvement in that Committee.

In addition, a number of APPEA members have made individual submissions to you commenting on the issues under consideration by the Review. APPEA commends these submissions to you.

2. GENERAL COMMENTS

Reliable, secure and competitively priced energy is crucial to our everyday lives in Australia. Within this framework, oil and gas are playing a key role in meeting many of our energy needs. At present, petroleum (oil and gas) accounts for more than 50 per cent of Australia's primary energy needs – this is expected to increase into the foreseeable future.

Just as importantly, the industry is creating significant wealth for the country, including by employing 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 ongoing health of the Australian economy.

In this respect, APPEA endorses that one of the key objectives of the Review should be, as noted on page iii of the Report, that it consider

> *… whether the existing rules and regulations governing behaviour in energy markets are consistent with promoting efficient, reliable, safe and secure supplies in the long term …*

APPEA's more detailed comments on the Report are similarly framed against this objective and the role the Australian upstream oil and gas industry can and should play in providing efficient, reliable, safe and secure energy supplies in the long-term.

APPEA strongly supports the key preliminary conclusion from the 1st Interim Report that

> *The existing arrangements governing how wholesale electricity and gas are traded appear capable, without fundamental change, of promoting efficient, reliable and secure energy supplies in the context of the CPRS …*

The relationship between the supply and demand of energy should be enabled through market mechanisms. APPEA is therefore very supportive of the market based approach utilised in the electricity and gas markets today since overt government or regulatory intervention inevitably distorts the level playing field between market participants. This in-turn produces significant inefficiencies in the

system and in many cases discourages the entry of new, efficient participants into the market. APPEA accepts that minor changes to the arrangements may be advisable but these should always be kept to a minimum and/or temporary if possible.

3. THE AUSTRALIAN UPSTREAM OIL AND GAS INDUSTRY

It is important to place the APPEA's views on the issues raised by the Review's 1st Interim Report 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.

3.1 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 $23 billion while tax payments to the Australian and State and Northern Territory Governments totalled more than $8.1 billion;

- exports of petroleum, including crude oil, liquefied petroleum gas (LPG), liquefied natural gas (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;

- 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

    - CSG represents one of the strongest resources growth prospects in Australia. Queensland and New South Wales, in particular, have enormous quantities of natural gas in the form extensive CSG deposits. The vast potential of these resources is now starting to be realised. For example, CSG supplies 70 per cent of the Queensland's gas market and about 25 per cent of Eastern Australia's gas supply. Discovery of reserves continues to exceed current domestic supply and there are more than enough CSG reserves to meet the projected domestic and international demand for gas;

- Geoscience Australia estimated (in 2006) Australia's oil and condensate reserves are equivalent to around 10 years of production at current production

rates. Australia's natural gas reserves are equivalent to more than 100 years of current production. The inclusion of Australia's CSG assets adds substantially to this already significant gas resource base.

3.2 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[1].

Australia's natural gas reserves have the unique potential, in both the short-term and the long-term, to significantly reduce greenhouse gas emissions through the greater penetration of natural gas in the domestic market particularly in electricity generation. The industry can also help secure Australia's economic growth and job creation aspirations. The Review has an important role to play in helping ensure Australia's natural gas industry achieve its potential.

There is an opportunity for Australia to generate significant additional national economic, environmental and social benefits from its substantial natural gas reserves 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 800 to 1,300 kg of CO_2 per megawatt hour (MWh)of generation while a combined cycle gas turbine (CCGT) power station produces around 350 to 360 kg per MWh[2]
  - 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;
- 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

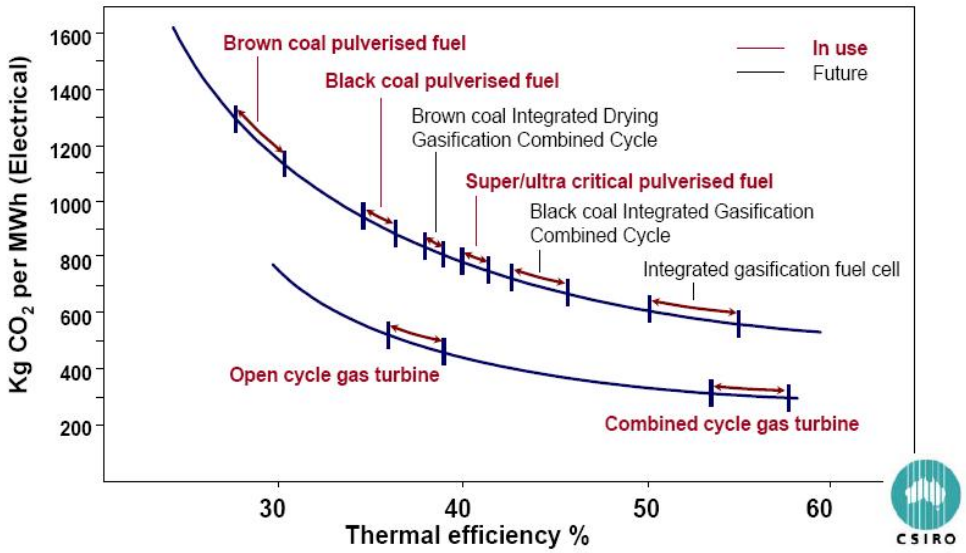
[1] See, for example, International Energy Agency (2008), *World Energy Outlook 2008* (available at www.worldenergyoutlook.org/2008.asp) and Energy Information Administration (2008), *International Energy Outlook 2008* (available at www.eia.doe.gov/oiaf/ieo/index.html).
[2] Energy Futures Forum (2006), *The Heat is on: the future of energy in Australia*, December (see www.csiro.au/science/EnergyFuturesForum.html for further details).

compared to coal. This allows for better staging of incremental development to meet demand requirements; and

- development of new chemical industries.

In the case of greenhouse gas emissions, Figure 1 below illustrates the greenhouse gas emission benefits of gas-fired generation. It shows that, unless carbon capture and storage (CCS) technology is commercially viable, CCGT generation will remain by far the fossil fuel generation technology with the lowest greenhouse gas emissions.

Figure 1: 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?*[3], 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
- approximately 4.3 Mt CO_2-e/year for a CCGT plant.

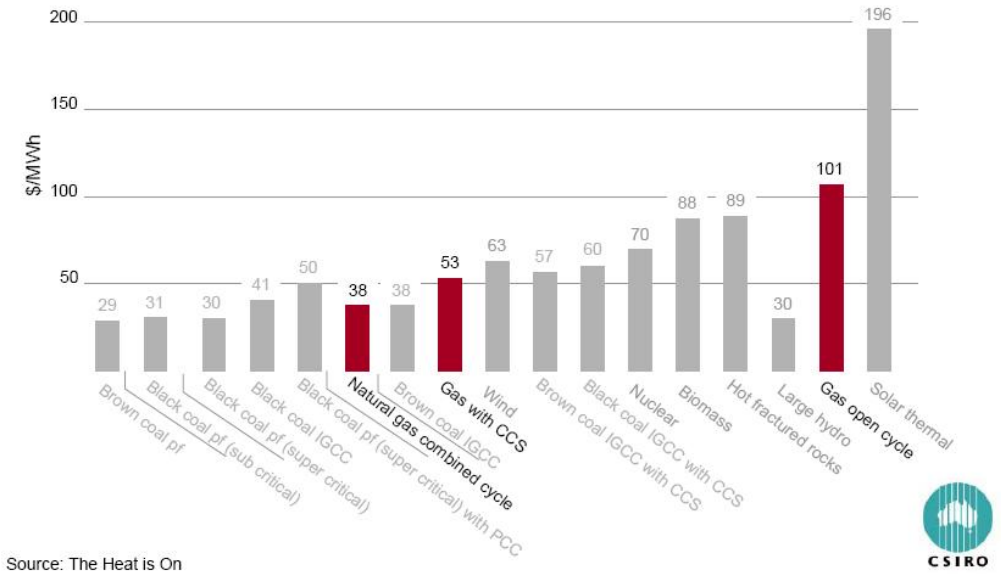
This means that over a lifetime of 40 years, the greenhouse gas emissions savings from a CCGT power plant would be 178 Mt CO_2-e relative to a brown coal plant and 85 Mt CO_2-e relative to a black coal plant. As a reference point, Australia's

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

total electricity sector greenhouse gas emissions in 2006 were around 205 Mt CO_2-e[4].

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, that shows (Figure 2) the cost differential between current energy sources is not significant.

Figure 2: Estimated electricity generation costs of selected centralised electricity generation technologies



Source: The Heat is On

4. SPECIFIC COMMENTS ON ISSUES RAISED IN THE 1ST INTERIM REPORT

With this background in mind, APPEA has indentified a number of key issues raised in the 1st Interim Report. These relate particularly to the role of natural gas identified in Section 3 above and the role the Review can play in ensuring that natural gas realises its full potential in Australia for achieving the objective of promoting efficient, reliable, safe and secure energy supplies in the long-term.

4.1 Resilience of existing frameworks to the CPRS

APPEA notes page v of the 1st Interim Report states:

> *The key impact of the CPRS will be increased costs for carbon-intensive generation. This will potentially affect how existing generators operate, and change the economics of new investment in favour of lower-carbon (e.g. gas) and zero carbon (i.e. wind) technologies. It will also increase prices in wholesale markets, and related contract markets.*

[4] 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).

> *If the CPRS results, over time, in increased use of existing gas-fired generation and significant investment in new gas-fired generation, then there will be a large increase in the volume of gas and pipeline capacity being contracted for and traded through existing gas markets.*

While theoretically this is correct, the situation is complicated by the presence of the expanded national Renewable Energy Target (RET) scheme.

As part of its desire to ensure that energy and greenhouse policy responses, particularly the emissions trading scheme due to commence in 2010, achieve their objectives at least cost to the Australian economy, APPEA has taken particular interest in the design of measures, such as the RET, that seek to 'complement' a domestic emissions trading scheme.

In late 2007 APPEA commissioned economic consultants, CRA International (CRAI), to examine the costs associated with the proposal to adopt an expanded target of 20 per cent of electricity generation from renewable sources by 2020. A copy of the CRAI report, *Implications of a 20 per cent renewable energy target for electricity generation*, can be found at **Attachment 1**.

A finding of concern to APPEA and other parts of Australian industry is that the analysis shows that the combination of an emissions trading scheme with a 20 per cent renewable energy target is significantly less efficient than an emissions trading scheme in achieving a given level of emissions abatement.

The report finds that to reach an emissions abatement target of 67 megatonnes of carbon dioxide equivalent in 2020, the combined emissions trading scheme plus a 20 per cent RET policy:

- costs $1.8 billion more in 2020 than an emissions trading scheme policy in terms of gross national product losses;
- costs $1.5 billion more in 2020 than the emissions trading scheme in output (gross domestic product, GDP) losses;
- results in the loss of an additional 3,600 full time equivalent jobs in 2020;
- causes substantial switching away from gas-fired generation compared with an emissions trading scheme in the order of 12,620 gigawatt hours per year by 2020;
- results in household electricity prices rising at least 6 percentage points more than would be the case under an emissions trading scheme.

In its submission to the Garnaut Climate Change Review[5], the Productivity Commission said:

[5] Available at www.pc.gov.au/__data/assets/pdf_file/0003/79716/garnaut.pdf.

> *An MRET operating in conjunction with an ETS would not encourage any additional abatement, but still impose additional administration and monitoring costs. To the extent that the MRET is binding (which is its purpose) it would constrain how emission reductions are achieved — electricity prices would be higher than otherwise and market coordination about the appropriate time to introduce low-emissions energy technologies would be overridden. If it was non-binding, it would simply increase administrative, compliance and monitoring costs. Moreover, it would also help to foster a perception that governments are amenable to interfering with the least cost abatement objective of the ETS. This could encourage other potential beneficiaries to seek special programs that neither increase abatement nor reduce its cost.*

The Commission's submission also included a critique of the economic modelling undertaken by McLennan Magasanik Associates (MMA) in 2007 for the Climate Institute and the Renewable Energy Generators of Australia, purporting to show that the the large upfront costs associated with higher cost renewable technology were offset over time by cost savings captured from accelerated 'learning-by-doing'.

In considering this modelling, the Commission found:

> *MMA's assumptions appear to overstate the benefits from learning-by-doing in low-emissions energy sources. For example, it assumes no learning-by-doing in fossil fuel generation which is inconsistent with evidence in the literature, particularly in relation to gas generation technologies. This inflates the estimated benefits because the switch to renewables is assumed not to crowd out any technology development in fossil fuel technologies. And, no consideration is given to the possibility that 'breakthrough' technologies for low-cost clean electricity might render learning-by-doing in existing technologies redundant. In addition, the study:*
>
> - *uses learning-by-doing rates that appear to be very optimistic*
> - *excludes the costs of forgoing learning-by-doing benefits associated with abatement activities displaced by the low-emissions target criteria*
> - *applies to a tax, rather than a quantity restriction, so part of the estimated benefit from additional abatement is unlikely to occur under an ETS.*
>
> *Also, given that additional generation under low-emissions energy targets might come mainly from relatively mature technologies, such as wind power, the potential for benefits from learning-by-doing is reduced. These considerations explain why MMA concludes that there are cost savings available from low-emissions energy targets, in contrast with other modelling work that shows that such targets impose net costs.*

These same critiques apply to more recent modelling conducted by MMA for the Department of Climate Change[6] and the MMA work quoted in the 1st Interim Report.

While APPEA notes the terms of reference for the Review preclude it from reviewing the design of the RET, APPEA recommends the Review examine the implications of the RET for gas-fired electricity generation, energy market frameworks and the delivery of efficient, reliable, safe and secure energy supplies in the long-term.

This issue is considered further in Section 4.2.1 below.

4.1.1 Wholesale markets and investment

APPEA's notes the 1st Interim Report's preliminary conclusion on page v that

> *In respect of gas markets, while traded volumes might well increase substantially, the existing frameworks based on bilateral trading and complemented by the new Bulletin Board (BB) and proposed Short-Term Trading Market (STTM) appear capable of facilitating efficient gas market trading and the required investment in new capacity.*

APPEA is a member of the Gas Market Leaders Group (GMLG), established by the Ministerial Council on Energy (MCE) Standing Committee of Officials in 2005 as an industry-led group to prepare a gas market development plan (the Plan) and oversee its implementation[7].

The Plan, published in June 2006[8], seeks to deliver on the MCE objectives for a competitive, reliable and secure natural gas market delivering increased transparency, promoting further efficient investment in gas infrastructure and providing efficient management of supply and demand interruptions.

APPEA is heavily involved in the GMLG's work, including in the implementation and ongoing operation of the BB[9] and the development of the STTM. The STTM is due to commence on 1 July 2010, the same day as the domestic emissions trading scheme is due to commence. It is, therefore, important that the groups overseeing the development of both policies work together to ensure the two operate effectively. This will help to ensure that the 1st Interim Report's expectation –that the BB and STTM can accommodate the emissions trading scheme –is actually realised.

[6] McLennan Magasanik Associates (2009), *Benefits and Costs of the Expanded Renewable Energy Target*, January (available at www.climatechange.gov.au/renewabletarget/publications/pubs/mma_ret_report.pdf).
[7] See www.ret.gov.au/energy/ministerial_council_on_energy/Pages/ministerial_council_on_energy.aspx for further information.
[8] Gas Market Leaders Group (2006), *National Gas Market Development Plan Gas Market Leaders Group Report to the Ministerial Council on Energy*, June (available at www.ret.gov.au/Documents/mce/_documents/FinalGMLGReport20060707135526.pdf).
[9] The BB commenced operation on 1 July 2008 and can be viewed at www.gasbb.com.au.

APPEA recommends the Review encourage formal engagement between the relevant MCE officials, the GMLG and Department of Climate Change officials overseeing the development of the domestic emissions trading scheme and expanded RET to ensure both policy focuses – greenhouse responses and gas market development – work together effectively.

4.2 Resilience of existing frameworks to the expanded RET

APPEA endorses the preliminary conclusions of the 1st Interim Report, as set out on page vi, that call into question the resilience of existing frameworks to the market distortions that will be caused by the implementation of the expanded RET.

4.2.1 Transmission investment for new connections

Increased penetration of renewable energy into the grid will impose a number of technical challenges for electricity transmission and infrastructure. Some renewable electricity generation (for example, wind power) is intermittent and less predictable than gas- or coal-fired power. It also typically has a lower capacity factor, meaning that more infrastructure is required per gigawatt hour of generation produced. This additional infrastructure is of course associated with higher costs of production using these technologies in order for them to be reliable sources of power to the grid.

For example, the CRAI report, *Implications of a 20 per cent renewable energy target for electricity generation,* found the developments required to meet the RET are substantial. Over and above the reference case used in the economic modelling underpinning the report, that already requires the addition by 2020 of 4.8 million solar panel modules, the expanded RET would require a further 16.1 million solar panel modules be installed. This equates to an additional 80.5 million solar cells. The policy would also see an additional 7,700 wind turbines installed, over and above the reference case addition of 2,340 wind turbines by 2020. To achieve 5 per cent of the RET from geothermal energy sources would require the successful implementation of the Cooper Basin geothermal resource to at least Phase II of the project.

It is unclear how existing energy market frameworks will cope with these developments.

While APPEA, as noted above, acknowledges the terms of reference for the Review preclude it from reviewing the design of the RET, the Review could note that one of the common criticisms of the renewable-based generators using, for example, wind and solar is that, on the margin, they cannot act in base load service and therefore require support from gas-fired generators. If one of the aims of the expanded RET is to make room for renewables in base load service, then an option is to consider amending the RET to provide opportunities for renewable energy proponents to enter into a commercial arrangement with a gas-fired generator to provide reliable base load capacity. Under such an approach a combined renewables/gas-based project would provide base load power generation and could possibly be eligible to a proportion of a Renewable Energy

Certificate (say, 50 per cent) to recognise the synergies the approach in facilitating the entry of renewables into base load service.

5. THE NEED FOR ONGOING CONSULTATION

APPEA looks forward to working with the Review, both directly and as part of its membership of the Review's Stakeholder Advisory Committee, to ensure that the Review meets its overarching objectives and that the role of Australia's natural gas industry is fully and appropriately recognised in the design of Australia's energy market frameworks.

The issues outlined above require further discussion and consideration. APPEA looks forward to playing an active and constructive role in these ongoing consultation processes.