



AUSTRALIAN PETROLEUM PRODUCTION & EXPLORATION
ASSOCIATION LIMITED

SUBMISSION TO THE HOUSE OF REPRESENTATIVES SCIENCE AND INNOVATION COMMITTEE

Inquiry into geosequestration technology

AUGUST 2006

ACN 44 000 292 713

HEAD OFFICE

GPO BOX 2201
CANBERRA ACT 2601

LEVEL 3

24 MARCUS CLARKE STREET
CANBERRA ACT 2600
PHONE 61 2 6247 0960
FAX 61 2 6247 0548

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

<http://www.appea.com.au>

EMAIL

appea@appea.com.au

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
2. THE SCIENCE UNDERPINNING GEOSEQUESTRATION TECHNOLOGY AND THE GLOBAL EXPERIENCE OF THE UPSTREAM OIL AND GAS INDUSTRY	2
2.1 Geosequestration science	2
2.2 Geosequestration-relevant experience in the upstream oil and gas industry	2
2.3 International geosequestration projects and policy developments ..	3
2.3 Australian geosequestration projects	4
3. THE POTENTIAL ENVIRONMENTAL AND ECONOMIC BENEFITS AND RISKS OF GEOSEQUESTRATION TECHNOLOGY	5
4. THE SKILL BASE IN AUSTRALIA TO ADVANCE THE SCIENCE OF GEOSEQUESTRATION TECHNOLOGY	6
5. REGULATORY AND APPROVAL ISSUES GOVERNING GEOSEQUESTRATION TECHNOLOGY AND TRIALS	6
5.1 Developing an appropriate legislative and regulatory framework for geosequestration technology and trials in Australia	6
5.2 Considerations underpinning the regulation of geosequestration in Australia.....	7
5.3 A key issue: managing long term liabilities and decommissioning	8
6. HOW TO BEST POSITION AUSTRALIAN INDUSTRY TO CAPTURE POSSIBLE MARKET APPLICATIONS.....	10
6.1 The importance of an appropriate and supportive domestic legislative and regulatory framework	10
6.2 Active involvement in international developments.....	12

EXECUTIVE SUMMARY

The Australian Petroleum Production & Exploration Association (APPEA) is the representative body of the upstream oil and gas industry in Australia.

Its membership encompasses the vast majority of oil and gas producers in Australia and many service companies who may be participants in geosequestration projects into the future.

The oil and gas industry has been a driving force behind research and development of geosequestration technologies in Australia and on the international stage.

Geosequestration science

APPEA does not intend in this submission comment in depth on the science underpinning geosequestration. There already exists substantial published literature and appropriate science-based organisations will be providing submissions to the inquiry.

Geosequestration-relevant experience in the upstream oil and gas industry

However, APPEA does note that while there remain areas for ongoing research, development and demonstration (R,D&D), the underlying technologies to enable geosequestration projects to proceed are well established within the oil and gas industry worldwide, many of them having been in use (including by APPEA members as part of their global operations) for a number of decades.

However, commercial-scale geosequestration developments continue to face important challenges. However, these challenges are not generally considered to be insurmountable.

International geosequestration projects and policy developments

The oil and gas industry has also been a driving force internationally, through projects such as Sleipner in the North Sea and Weyburn in Canada and involvement in international forums such as the Carbon Sequestration Leadership Forum (CSLF) and Asia-Pacific Partnership on Clean Development and Climate (AP6).

Australian geosequestration projects

There are no operating geosequestration projects currently underway in Australia. However, a number of projects are at various stages of consideration/development. These include the Gorgon Project and the Otway Basin Pilot Project.

Each of these Australian projects, and the technical and other issues associated with them, are discussed in further detail in submissions to the Committee from a number of APPEA members. APPEA would refer you to these submissions.

The potential environmental and economic benefits and risks of geosequestration technology

There are a range of potential environmental and economic benefits associated with geosequestration technology.

The clearest environmental benefit associated with geosequestration technology relates to the technology's potential to make a contribution to significantly lowering the greenhouse gas emissions associated with fossil fuel use, particularly its use in power generation.

Environmental issues associated with geosequestration relate to the fact that carbon dioxide storage presents technical and regulatory issues associated with ensuring safe operations and the integrity of the site over the long term.

Australia has the skill base and scientific infrastructure and expertise to assume a world leading position in the development of geosequestration technologies. This presents economic opportunities for the development of an Australian-based geosequestration services industry as well as the opportunity to develop further commercial-scale geosequestration projects in Australia.

The skill base in Australia to advance the science of geosequestration technology

Many of the skills required for the implementation of geosequestration projects are drawn from earth sciences and engineering disciplines and applied, for example, in the upstream oil and gas industry.

Australia, by virtue of its well established skill base in these disciplines, is potentially well placed to become a world leader in geosequestration.

Regulatory and approval issues governing geosequestration technology and trials

APPEA notes it is important that an appropriate legislative and regulatory framework for geosequestration be developed in Australia, to ensure that geosequestration projects are effectively and efficiently developed while at the same time ensuring the community interests are adequately served.

Each potential geosequestration project is likely to be unique. Project proponents will conduct their own

evaluations to determine whether a project is commercially viable. It is the approvals processes that will be critical in determining whether a project meets regulatory standards.

APPEA notes that the Department of Industry, Tourism and Resources is currently consulting with stakeholders on the possible development of the legislative and regulatory framework for geosequestration in Australia. APPEA is actively involved in these consultations.

APPEA notes that, where possible, existing regulatory regimes should provide appropriate models that can be applied to geosequestration. This does not necessarily mean that existing laws should be amended to apply to geosequestration (although this is an option), but rather that an entirely 'new' legislative and regulatory model does not need to be developed to regulate geosequestration activities in Australia.

When considering appropriate regulatory and approvals processes in Australia, such consideration should be underpinned by:

- an approach that protects the property rights of pre-existing petroleum title holders
- to do anything else, that is, to consider altering rights entered into in good faith after the event, would introduce an entirely inappropriate level of sovereign risk into the regulation of the upstream oil and gas industry in Australia, and risk jeopardising future exploration and investment in the Australian industry. In addition, it would run counter to a stated Australian Government principle of maintaining a stable political and regulatory regime, a principle long held out as a key

to attracting investment to Australia.

- a 'least cost' regulatory approach;
- an objectives-based regulatory approach, consistent with the findings of the Taskforce on Reducing the Regulatory Burden on Business;
- not distorting R,D&D
 - the regulation of commercial projects should be distinct from the regulation of R,D&D projects. R,D&D could, for example, be considered on a case-by-case basis and should not be subject to significant delays pending agreement on a national regulatory framework; and
- the ideal that the regulatory framework should be nationally and internationally consistent.

How to best position Australian industry to capture possible market applications

An appropriate and supportive domestic legislative and regulatory framework and active involvement in international developments represent the most effective way for policymakers to assist Australian industry to capture possible market applications for geosequestration technology.

Domestically, governments can continue to encourage the voluntary uptake of geosequestration by:

- putting in place a regulatory environment that encourages the uptake of geosequestration rather than acting as a disincentive;
- considering (on a case-by-case basis) targeted financial support for geosequestration projects;

- ensuring proponents of early geosequestration projects ('early movers') are not disadvantaged by any future greenhouse gas abatement measures; and
- adopting a policy where Government assumes the long term responsibility of a geosequestration site once certain site closure criteria have been met.

Internationally, APPEA is a member of the Australian CSLF delegation and the upstream oil and gas industry plays an active role in CSLF meetings. Australia can continue to support the development of geosequestration technology by playing an active and supportive role in CSLF deliberations and ensuring the CSLF evolves into a forum that promotes practical actions.

Australia can also continue to play a leading role in geosequestration-related developments as part of its involvement with AP6. AP6 represents a key initiative that recognises the importance of promoting the use of clean, efficient technologies to meet goals for energy security, national air pollution reduction, and climate change in ways that promote sustainable economic growth and poverty reduction.

1. INTRODUCTION

The Australian Petroleum Production & Exploration Association (APPEA) is the representative body of the upstream oil and gas industry in Australia. Its membership encompasses the vast majority of oil and gas producers and many service companies who may be participants in geosequestration projects into the future.

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. 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. As a part of this, APPEA recognises geosequestration of (principally) carbon dioxide (CO₂) as a technology that has the potential to contribute significantly to the global task of cutting greenhouse gas emissions associated with the use of fossil fuels.

APPEA was a member of the Ministerial Council on Mineral and Petroleum Resources (MCMPR) Carbon Dioxide Geosequestration Regulatory Working Group, has been involved in consultations on the development of the legislative and regulatory framework for geosequestration activities in Australia and has been an active participant in the Carbon Sequestration Leadership Forum (CSLF)¹ and the Asia-Pacific Partnership on Clean Development and Climate (AP6)².

The oil and gas industry has been a driving force behind research and development of geosequestration technologies in Australia (the former Australian Petroleum Cooperative Research Centre (GEODISC) and the current Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC)) and on the international stage.

APPEA's submission has been organised to directly address each of the terms of reference for the inquiry, namely:

- the science underpinning geosequestration technology;
- the potential environmental and economic benefits and risks of such technology;
- the skill base in Australia to advance the science of geosequestration technology;

¹ See www.csforum.org/index.htm for further details.

² See www.asiapacificpartnership.org for further details.

- regulatory and approval issues governing geosequestration technology and trials; and
- how to best position Australian industry to capture possible market applications.

2. THE SCIENCE UNDERPINNING GEOSEQUESTRATION TECHNOLOGY AND THE GLOBAL EXPERIENCE OF THE UPSTREAM OIL AND GAS INDUSTRY

2.1 Geosequestration science

APPEA does not intend in this submission comment in depth on the science underpinning geosequestration. There already exists substantial published literature³ on the topic and we understand that appropriate science-based organisations, such as the CO2CRC and CSIRO, will be providing submissions to the inquiry. Both the CSIRO and CO2CRC are internationally recognised for their leadership in this area.

2.2 Geosequestration-relevant experience in the upstream oil and gas industry

APPEA does note that while there remain areas for ongoing research, development and demonstration (R,D&D), the underlying technologies to enable geosequestration projects to proceed are well established within the oil and gas industry worldwide, many of them having been in use (including by APPEA members as part of their global operations) for a number of decades. Such technologies include:

- design, drilling and operation of injection and observation wells;
- reservoir modelling and simulation;
- understanding of fault/fracture seal and activation;
- compression and transportation of CO₂ by pipeline;
- reservoir management tools such as pressure maintenance;
- monitoring technologies; and

³ The publication Intergovernmental Panel on Climate Change (2005), *Carbon Dioxide Capture and Storage*, IPCC Special Report, Geneva, September (available at arch.rivm.nl/env/int/ipcc/pages_media/SRCCS-final/SRCCS_WholeReport.pdf) provides a useful discussion of the underlying science and technology development. Similarly, the publication International Energy Agency (2004), *Prospects for CO₂ Capture and Storage*, IEA Report, Paris (available at www.iea.org/textbase/nppdf/free/2004/prospects.pdf) provides an overview of geosequestration science. The CSLF Education Centre, available at www.cslforum.org/education.htm, provides a 'non-technical' overview of a range of geosequestration issues including the science underpinning geosequestration. A more detailed discussion is available in the CSLF *Technology Roadmap*, available at www.cslforum.org/documents/CSLF_Technology_Roadmap.pdf.

- risk assessment and mitigation.

In addition, and as part of their operations around the world, the upstream oil and gas industry has undertaken a number of activities that have relevance to geosequestration technology, including:

- injecting CO₂ for the purposes of extracting additional hydrocarbons (often referred to as enhanced oil recovery);
- injecting production water back into the reservoir from which it has been produced;
- storing “acid gas” (a mixture of hydrogen sulphide (H₂S) and CO₂) produced from “sour” gas reservoirs; and
- storing natural gas produced during ‘non-peak’ demand periods for use during ‘peak’ demand periods.

Commercial-scale geosequestration developments continue to face important challenges, including:

- CO₂ capture from large combustion facilities remains relatively costly; and
- CO₂ storage presents technical and regulatory issues associated with ensuring safe operations and the integrity of the site over the long term.

However, these challenges are not generally considered to be insurmountable, and, as noted above, the oil and gas industry has been a driving force behind R,D&D of geosequestration technologies in Australia.

2.3 International geosequestration projects and policy developments

The oil and gas industry has also been a driving force internationally, through projects such as Sleipner in the North Sea and Weyburn in Canada and involvement in international forums such as the CSLF and AP6.

Since 1996, the Norwegian oil company, Statoil, has been injecting approximately one million tons per year of recovered CO₂ into the Utsira Sand, a saline formation under the North Sea associated with the Sleipner West Heimdel gas reservoir. This is the only commercial CO₂

geological sequestration facility in the world using a saline reservoir to store CO₂⁴.

The IEA GHG Weyburn CO₂ Monitoring and Storage Project, located in mid-western Canada, has been injecting CO₂ into the Weyburn oil field since October 2000 as part of an enhanced oil recovery process to extend the life of the field. The project also demonstrates the feasibility of transportation of CO₂. The Dakota Gasification Company delivers the CO₂ to the Weyburn operation through a 320 kilometre long pipeline⁵.

The oil and gas industry is an active participant in the meetings of the CSLF, including through APPEA as part of the Australian delegation. The most recent meeting of the CSLF Policy and Technical Groups was held in New Delhi, India from 3 to 5 April 2006. Key outcomes from the India meeting included development of a CSLF Strategic Plan, recognition of international collaborative efforts, further efforts to enhance stakeholder participation (a key to the future of the CSLF) and updates on financial, capacity building and public outreach activities.

The industry is also an active participant in the AP6 process which is currently considering, particularly through the AP6 Cleaner Fossil Energy Task Force, possible geosequestration-related projects.

2.3 Australian geosequestration projects

There are no operating geosequestration projects currently underway in Australia. However, a number of projects are at various stages of consideration/development. These include the:

- *Gorgon Project*: operated by Chevron Australia in joint venture with ExxonMobil and Shell, the Gorgon Project plans to develop the Greater Gorgon gas fields, located between 130 kilometres and 200 kilometres off the north-west coast of Western Australia. The Greater Gorgon gas fields contain Australia's largest known undeveloped gas resource. The project proposal includes greenhouse gas management via injection of CO₂ into deep formations beneath Barrow Island⁶; and

⁴ Statoil (2006), CO₂ projects, (available at www.statoil.com/statoilcom/svg00990.nsf?opendatabase&lang=en&artid=70784c23d11b70acc125718d002e5786). The Sleipner project is one of four geosequestration projects listed by Statoil on their website.

⁵ See International Energy Agency Greenhouse Gas R&D Programme (2006), *Weyburn Enhanced Oil Recovery Project* (available at www.co2captureandstorage.info/project_specific.php4?project_id=70) and Petroleum Technology Research Centre, Canada (2006), *IEA GHG Weyburn CO₂ Monitoring and Storage Project*, (available at www.ptrc.ca/access/DesktopDefault.aspx?tabindex=0&tabid=111).

⁶ Gorgon Project (2006), *The Gorgon Project* (available at www.gorgon.com.au/index.html).

- *Otway Basin Pilot Project*: the CO2CRC⁷ has developed a research project which involves extracting CO₂ and methane gas from an existing well, separating these gases in a temporary surface separation plant and compressing the CO₂ to a supercritical state in a compressor/refrigeration unit. This condensed CO₂ will then be transported and injected into a depleted natural gas field where it will be monitored by the CO2CRC. A comprehensive monitoring program across the atmospheric, near surface and subsurface domains is being planned. It is estimated that 100,000 tones of CO₂ will be injected over 1 to 2 years and monitoring and modelling activities will continue post injection for several years.

Each of these Australian projects, and the technical and other issues associated with them, are discussed in further detail in submissions to the Committee from a number of APPEA members. APPEA would refer you to these submissions.

3. THE POTENTIAL ENVIRONMENTAL AND ECONOMIC BENEFITS AND RISKS OF GEOSEQUESTRATION TECHNOLOGY

There are a range of potential environmental and economic benefits associated with geosequestration technology.

The clearest environmental benefit associated with geosequestration technology relates to the technology's potential to make a contribution to significantly lowering the greenhouse gas emissions associated with fossil fuel use, particularly its use in power generation.

Australian Government estimates contained in the June 2004 Energy White Paper, *Securing Australia's Energy Future*, estimated geosequestration may lower greenhouse gas emissions associated with, for example, natural gas in power generation by over 80 per cent⁸.

As noted above, environmental considerations associated with geosequestration relate to the fact that CO₂ storage presents technical and regulatory issues associated with ensuring safe operations and the integrity of the site over the long term. These are considered further in Section 5.

As will be considered further in Section 4, Australia has the skill base and scientific infrastructure and expertise to assume a world leading position in the development of geosequestration technologies. This presents economic opportunities for the development of an Australian-based geosequestration services industry as well as the opportunity to develop

⁷ CO2CRC (2006), *Geosequestration Research Project*, (available at www.co2crc.com.au/pilot/OBPP.html).

⁸ See Australian Government (2004), *Securing Australia's Energy Future*, Energy White Paper, Canberra, June, p. 142 (available at www.pmc.gov.au/publications/energy_future/docs/energy.pdf).

further commercial-scale geosequestration projects in Australia. As noted above, however, current CO₂ capture technology remains relatively expensive and further R,D&D is required to reduce this cost.

4. THE SKILL BASE IN AUSTRALIA TO ADVANCE THE SCIENCE OF GEOSEQUESTRATION TECHNOLOGY

Many of the skills required for the implementation of geosequestration projects are drawn from earth sciences and engineering disciplines and applied, for example, in the upstream oil and gas industry.

Australia, by virtue of its well established skill base in these disciplines, is potentially well placed to become a world leader in geosequestration. The work of the CO₂CRC and the preceding GEODISC program has also helped position Australia as a world leader in this regard.

Continued support for earth sciences and engineering in tertiary education institutions and targeted support for R,D&D of geosequestration through organisations such as the CO₂CRC and existing general R&D support programs such as the R&D Start⁹ program and R&D Tax Concession¹⁰ are considered effective ways to ensure that Australia has the skill base to implement geosequestration projects.

In addition, the global operations of many of APPEA's members means that the Australian industry potentially has access to a global skills base to advance the science of geosequestration technology.

5. REGULATORY AND APPROVAL ISSUES GOVERNING GEOSEQUESTRATION TECHNOLOGY AND TRIALS

5.1 Developing an appropriate legislative and regulatory framework for geosequestration technology and trials in Australia

APPEA notes it is essential that an appropriate legislative and regulatory framework for geosequestration be developed in Australia, to ensure that geosequestration projects are effectively and efficiently developed while at the same time ensuring the community interests are adequately served.

Each potential geosequestration project is likely to be unique. Project proponents will conduct their own evaluations to determine whether a project is commercially viable. It is the approvals processes that will be critical in determining whether a project meets regulatory standards.

⁹ See www.ausindustry.gov.au/content/level3index.cfm?ObjectID=318B569B-C9AA-4FE2-A1C2DDF2272DB604&L2Parent=AEB901E5-7CB8-4143-A3BF33B2423F9DA6 for further information.

¹⁰ See www.ausindustry.gov.au/content/level3index.cfm?ObjectID=40CEE157-EC9F-4AE3-863FFB2EEFE79ED9&L2Parent=AEB901E5-7CB8-4143-A3BF33B2423F9DA6 for further information.

As noted above, APPEA contends that while the opportunity to reduce greenhouse gas emissions by geosequestration is new, it utilises technologies and operational practices that are well established in the upstream oil and gas industry.

APPEA also notes that the Department of Industry, Tourism and Resources (DITR) is currently consulting with stakeholders on the possible development of the legislative and regulatory framework for geosequestration in Australia. APPEA is actively involved in these consultations. As this process is ongoing, APPEA's submission to the Committee does not comment on the detail of the DITR proposals, but rather our views on the appropriate approach to regulation of geosequestration in Australia and some key issues for consideration.

5.2 Considerations underpinning the regulation of geosequestration in Australia

APPEA notes that, where possible, existing regulatory regimes should provide appropriate models that can be applied to geosequestration. APPEA supported this general approach as part of the consultation leading to the publication of the MCMPR *Regulatory Guiding Principles for Carbon Capture and Geological Storage*¹¹ in November 2005. This does not necessarily mean that existing laws should be amended to apply to geosequestration (although this is an option), but rather that an entirely 'new' legislative and regulatory model does not need to be developed to regulate geosequestration activities in Australia.

Many aspects of geosequestration projects are similar to routine oil and gas operations and existing laws, regulations and regulatory principles can be readily applied. Regulation needs to be low-cost, objectives-based and flexible to allow for the differing geological and infrastructural attributes of particular sites/projects. When considering appropriate regulatory and approvals processes in Australia, such consideration should be underpinned by:

- an approach that protects the property rights of pre-existing petroleum title holders
 - to do anything else, that is, to consider altering rights entered into in good faith after the event, would introduce an entirely inappropriate level of sovereign risk into the regulation of the upstream oil and gas industry in Australia, and risk jeopardising future exploration and investment in the Australian industry. In addition, it would run counter to a stated Australian Government principle of maintaining a stable political and regulatory regime,

¹¹ Ministerial Council on Mineral and Petroleum Resources (2005), *Regulatory Guiding Principles for Carbon Dioxide Capture and Geological Storage*, 25 November (available at www.industry.gov.au/assets/documents/itrinternet/Regulatory_Guiding_Principles_for_CCS20051124145652.pdf).

a principle long held out as a key to attracting investment to Australia¹².

- a 'least cost' regulatory approach;
- an objectives-based regulatory approach, consistent with the findings of the Taskforce on Reducing the Regulatory Burden on Business (the Banks Review)¹³;
- not distorting R,D&D
 - the regulation of commercial projects should be distinct from the regulation of R,D&D projects. R,D&D could, for example, be considered on a case-by-case basis and should not be subject to significant delays pending agreement on a national regulatory framework;
- the ideal that the regulatory framework should be nationally and internationally consistent.

5.3 A key issue: managing long term liabilities and decommissioning

Much of the ongoing debate around geosequestration centres on low probability events associated with a containment failure and release of CO₂. For example, there is a focus in many forums on the issue of how to manage long term liabilities. While these are important issues, the most effective way to mitigate risk of containment failure is through rigorous site selection and management of injection operations. It is important that this matter is given appropriate weight in discussing how geosequestration projects might be regulated.

Resolving the issue of long term responsibilities and liabilities is paramount. APPEA strongly endorses the view presented in the *MCMR Regulatory Guiding Principles for Carbon Dioxide Capture and Geological Storage* that responsibility and liability should rest with project proponents until such time as the relevant government is satisfied to a high degree of certainty that the conditions under approvals processes have been met, risks of leakage are low and that ongoing costs are acceptably low. Following closure, responsibility should rest with government. Current practices, such as those post closure in the upstream oil and gas industry, provide a suitable model.

Liability is intrinsically linked with risk but only exists when a project operator has failed to manage risk accordingly. The upstream oil and gas industry incurs a low cost of liabilities from its activities because the regulations that apply to the industry and the behaviour of companies

¹² See, for example, Invest Australia (2006), *Australia: Your Competitive Edge: The Facts*, page 5 (available at www.investaustralia.gov.au/media/Australia_The_Facts.pdf).

¹³ See www.regulationtaskforce.gov.au/index.html for further information.

within the industry have worked to ensure the inherent risks are well managed and do not create liabilities. This is a demonstration that, in this area, the approaches to managing operations in the upstream oil and gas industry are well suited to managing geosequestration projects.

Decommissioning and rehabilitation of geosequestration sites is comparable in many respects with decommissioning and rehabilitation activities related to oil and gas field operations. These relate to the removal of surface plant and equipment and the rehabilitation of the disturbed earth to the satisfaction of the government. There are well established policies and codes of conduct governing these activities in the Australian upstream oil and gas industry, including the:

- *APPEA Code of Environmental Practice*¹⁴: APPEA and its member companies are committed to sound resource conservation and environment protection practices as an integral part of industry operations. To ensure a high standard of industry operations within our unique environments, APPEA and its members have produced the *Code of Environmental Practice*. It contains substantial detail on all aspects of industry operations within the context of three basic recommendations (i.) environmental planning should be an integral part of the planning process; (ii.) the industry should ensure minimum impact on the environment, public health and safety by using the best practical technology; and (iii.) the industry should consult with communities about their concerns regarding industry activities; and
- *APPEA Principles of Conduct*¹⁵: APPEA and its member companies have agreed to a set of *Principles of Conduct* to communicate and explain shared core values to industry, regulators, and the communities in which they operate. The *Principles of Conduct* provide the basis for achieving the APPEA mission of a legislative, administrative, economic and social framework which efficiently and effectively facilitates safe, environmentally responsible, socially responsible and profitable oil and gas exploration, development and production.

There are also well established accounting provisions (under International Financial Reporting Standards) dealing with providing for decommissioning and rehabilitation expenditures in company accounts. Funds are provided for in the company accounts during the operational life of the project against the future costs of decommissioning and rehabilitation. The accounting principles require the costs (and therefore plans) of decommissioning and rehabilitation

¹⁴ See APPEA (1996), *APPEA Code of Environmental Practice* (available at www.appea.com.au/industryinformation/environment/initiatives/Docs/1996EnvCode.pdf).

¹⁵ See *APPEA Principles of Conduct*, available at www.appea.com.au/about/mission.asp.

to be reviewed and updated on a regular basis. These processes can be readily applied to geosequestration projects.

There are, however, a number of important fiscal-related issues (for example, the taxation treatment of circumstances where equipment is used for both petroleum and geosequestration-related activities) that will need to be considered in further detail before the legislative and regulatory framework for geosequestration can be further progressed in Australia. The underlying taxation framework will be an important driver towards the commerciality of geosequestration activities¹⁶.

6. HOW TO BEST POSITION AUSTRALIAN INDUSTRY TO CAPTURE POSSIBLE MARKET APPLICATIONS

An appropriate and supportive domestic legislative and regulatory framework and active involvement in international developments represent the most effective way for policymakers to assist Australian industry to capture possible market applications for geosequestration technology.

6.1 The importance of an appropriate and supportive domestic legislative and regulatory framework

Domestically, governments can continue to encourage the voluntary uptake of geosequestration by:

- putting in place a regulatory environment that encourages the uptake of geosequestration rather than acting as a disincentive;
- considering (on a case-by-case basis) targeted financial and/or technical support for geosequestration projects
 - as was noted in Section 3, geosequestration projects have the potential to realise significant abatement of greenhouse gas emissions. However, commercial-scale geosequestration projects entail large capital and operating costs. Government can, for example, assist industry in voluntarily implementing such projects through carefully targeted financial support. Such government support recognises that these projects do not directly produce income for the proponents but have a significant community benefit;

¹⁶ From an income taxation perspective, expenditures on geosequestration are currently treated the same as any other business expense (that is, capital costs are depreciated over the 'effective life' of the asset(s) in question), which means that, in many circumstances, these costs can take in excess of 20 years to be recovered for tax purposes. One way in which governments could facilitate the voluntary uptake of geosequestration projects would be to consider a taxation treatment of these expenses that more directly recognised the community benefit they provided (for example, by shortening the effective life over which depreciation can be claimed for taxation purposes).

- ensuring proponents of early geosequestration projects ('early movers') are not disadvantaged by any future greenhouse gas abatement measures; and
- adopting a policy where Government assumes the long term responsibility of a geosequestration site once certain site closure criteria have been met.

One of the disincentives to the early adoption of any greenhouse gas emissions reduction project – including geosequestration – is the risk that possible future greenhouse gas abatement measures would not recognise those early movers, thus placing them at a disadvantage compared to other project proponents.

The Australian Government has previously recognised the importance of this “no disadvantage” principle. For example, the report of the *Liquefied Natural Gas Action Agenda 2000* noted

... the Government will avoid greenhouse gas abatement policies and measures that discriminate against new entrants to Australian industry or disadvantage “early movers” in Australian industry who have previously implemented greenhouse gas abatement measures.¹⁷

The Australian Greenhouse Office (AGO) also worked with industry in 2000 and 2001 to develop an approach to providing 'credits' to recognise early greenhouse gas abatement action¹⁸.

In order to support the early and voluntary implementation of geosequestration projects, a clear guarantee is required from government that early proponents of geosequestration activities will not be disadvantaged under any future greenhouse gas abatement measures.

One of the primary areas of community concern around geosequestration projects is the view that it is unclear as to who will have long term responsibility for geosequestration sites.

Presently, project proponents have operational responsibility for sites up to the point of site closure and there is an acceptance that common law is appropriate to manage liabilities if any should arise.

¹⁷ Department of Industry, Science and Resources (2000), *Liquefied Natural Gas Action Agenda 2000*, Canberra, p. 31 (available at www.industry.gov.au/assets/documents/itrinternet/LNGAA.pdf).

¹⁸ See Australian Greenhouse Office (2000), *Encouraging Early Greenhouse Abatement Action: Public Consultation Paper*, Ministerial Council on Greenhouse, Commonwealth of Australia, November (available at www.greenhouse.gov.au/emissionstrading/earlycredits/pubs/early_credits.pdf).

In order to address community concerns in this area, government could consider as a matter of policy the assumption of liabilities from project proponents following the point of site closure.

Geosequestration proponents are investing significant resources in order to reduce greenhouse gas emissions. This reduction in greenhouse gas emissions represents a benefit to the wider community. Government agreeing to assume liability following site closure would effectively be a statement that government is also willing to share some burden in order to achieve the wider community benefit.

6.2 Active involvement in international developments

As noted above, APPEA is a member of the Australian CSLF delegation and the upstream oil and gas industry plays an active role in CSLF meetings through its involvement in various national delegations. Importantly, the CSLF is an international climate change initiative that is focused on development of improved cost-effective technologies for the separation and capture of carbon dioxide for its transport and long term safe storage. The purpose of the CSLF is to make these technologies broadly available internationally; and to identify and address wider issues relating to carbon capture and storage. This could include promoting the appropriate technical, political, and regulatory environments for the development of such technology.

Australia can continue to support the development of geosequestration technology by playing an active and supportive role in CSLF deliberations and ensuring the CSLF evolves into a forum that promotes practical actions.

Australia can also continue to play a leading role in geosequestration-related developments as part of its involvement with AP6. AP6 represents a key initiative that recognises the importance of promoting the use of clean, efficient technologies to meet goals for energy security, national air pollution reduction, and climate change in ways that promote sustainable economic growth and poverty reduction and is currently considering, particularly through the work of the AP6 Cleaner Fossil Energy Task Force, a number of potential geosequestration projects.