



# australian network of environmental defender's offices

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*Submission to the Inquiry into the Offshore  
Petroleum Amendment (Greenhouse Gas  
Storage) Bill 2008 & 3 related Bills*

15<sup>th</sup> August 2008

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The Australian Network of Environmental Defender's Offices (ANEDO) consists of nine independently constituted and managed community environmental law centres located in each State and Territory of Australia.

Each EDO is dedicated to protecting the environment in the public interest. EDOs provide legal representation and advice, take an active role in environmental law reform and policy formulation, and offer a significant education program designed to facilitate public participation in environmental decision making.

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## **Executive Summary**

The Australian Network of Environmental Defender's Offices Inc (ANEDO) is a network of 9 community legal centres in each state and territory, specialising in public interest environmental law and policy. ANEDO welcomes the opportunity to provide comment to the Senate Standing Committee on Economics on the *Petroleum Amendment (Greenhouse Gas Storage) Bill*.

ANEDO previously made a submission on the proposed legislation to the House of Representatives Primary Industries and Resources Committee (30<sup>th</sup> June 2008) and appeared before a hearing of that Committee on 16<sup>th</sup> July 2008. Our previous submission is available at [http://www.edo.org.au/policy/080630greenhouse\\_gas\\_storage.pdf](http://www.edo.org.au/policy/080630greenhouse_gas_storage.pdf); and a Hansard transcript of our evidence at the Committee hearing is available at: <http://www.aph.gov.au/house/committee/pir/exposedraft/hearings.htm>. This submission reiterates our previous recommendations.

Whilst the carbon capture and storage (CCS) of greenhouse gases (GHG) may provide short term assistance for Australia in obtaining its emission reduction targets under the Kyoto Protocol, it is by no means a silver bullet for addressing GHG emissions nor should it be a primary element of the Federal Government's energy policy. CCS encourages a "business as usual" approach for the energy industry with the ongoing environmental consequences likely to be passed on to future generations. It is assumed that the storage of GHGs will be incorporated in the Government's Emissions Trading Scheme, and ANEDO is concerned industry will potentially benefit from the "storage" of emissions despite the fact there is no guarantee of permanency.

ANEDO submits that injection and storage of GHG's is an investment in an end of pipe response that attempts to manage the effects of a system reliant on fossil fuel consumption. The focus instead should be on the allocation of greater funds into research and development of renewable sources of energy, such as solar, wind and tidal energy that will significantly assist in addressing the source of GHG emissions as opposed to directing funds at dealing with the consequences.

The *Petroleum Amendment (Greenhouse Gas Storage) Bill* (the Bill) places an enormous amount of emphasis on clarifying the rights of those parties wanting to store carbon emissions in relation to the existing and potential rights of those parties involved in the extraction and exploitation of fossil fuels. ANEDO submits that whilst such rights should clearly be defined by the Bill, they should not be its focus. The theory of the CCS process revolves around the permanent retention of GHG emissions that are prevented from entering the atmosphere and contributing

to deleterious anthropogenic impacts such as global warming and climate change. ANEDO therefore submits that the environmental safeguards around testing of permanent GHG retention in an ecologically sustainable manner should be the key focus of the Bill. This focus can be encouraged through the incorporation of a rigorous independent assessment process, an ongoing monitoring regime, and strict adherence to the principles of ecologically sustainable development.

The Bill provides very limited scope for public participation throughout the entire CCS process, from the Greenhouse Gas Acreage Releases<sup>1</sup> to the granting of a Site Closing Certificate<sup>2</sup>. The decision making process is dictated by Ministerial discretion, and as such ANEDO submits that the inclusion of an independent panel of accredited scientific experts would greatly assist in ensuring the CCS process in Australia operates in an environmentally responsible manner. ANEDO additionally supports the establishment of a trust fund to ensure financial provisions are made available for ongoing monitoring and remediation work for the extensive time periods envisaged in the CCS process.

CCS, being an end of pipe response, should form only a minor element of Australia's national climate change strategy, with investment prioritised for renewable energy projects. However, for CCS to play an appropriate limited role in Australia's climate change response, a more comprehensive, rigorous and transparent legislative regime is needed.

Our key recommendations are that the Bill should:

- include a defined set of objects consistent with the principles of Ecologically Sustainable Development (ESD);
- require extensive Environmental Impact Assessment prior to the issuing of any CCS operations;
- establish an independent committee to assess the site specific monitoring program required before a Site Closing Certificate is granted;
- designate “no-go zones” and extensive marine buffers for CCS operations and associated infrastructure around protected and vulnerable marine areas and islands;
- afford the States an opportunity for imposing a moratorium on environmental grounds;
- establish a Commonwealth held trust funded by those conducting GHG injection and storage operations for the purpose of funding ongoing MMV and remediation activities;
- set out guidelines for regarding the appropriate method to conduct injection and storage of GHGs on an “appraisal basis”;
- clarify the responsibilities and liabilities of those parties already conducting pilot CCS projects;
- include a mandatory publicly accessible CCS register;

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<sup>1</sup> See sections 249AJ and 249AP.

<sup>2</sup> See section 249CZF.

- establish rigid site criteria to ensure only optimal sites are declared “identified greenhouse gas storage formations”;
- include increased reporting requirements;
- include definitions for “permanent storage” and “public interest”;
- more clearly define the long term liability of operators and the Commonwealth;
- identify property rights in the CO<sub>2</sub> sequestered;
- provide more rigorous criteria to define what matters need to be considered by the Minister when granting access rights;
- set out a mandatory reporting period and structure following a Site Closing Certificate being issued; and
- require that the accompanying regulations and environmental guidelines should be released for public exhibition and comment prior to the Bill being finalised.

## **Contents**

This submission addresses the following key concerns with the legislation and makes recommendations to address the inadequacies:

1. Lack of certainty around long-term rights and responsibilities
  - a. Potential effects
  - b. Liability
2. Absence of objects and fundamental environmental principles
3. Insufficient monitoring, measurement and verification following the cessation of CCS operations
4. The lack of site criteria for an “eligible” and “identified” greenhouse gas storage formation
5. The emphasis on Ministerial discretion, and lack of appropriate mandatory criteria to be adhered to throughout the decision making process
6. The absence of an independent expert committee to evaluate and respond to community, scientific and environmental concerns
7. Transparency and accountability
8. “No go” zones
9. Consideration of international obligations
10. Review of state based regimes and existing pilot projects

### **1. Lack of certainty around long-term rights and responsibilities**

Due to the potential adverse effects if CCS fails to effectively and safely store greenhouse gases in the long-term, it is essential to have a comprehensive legislative scheme in place, with appropriate environmental safeguards. An inadequate regulatory regime, which operates primarily on Ministerial discretion, greatly enhances the likelihood of inappropriate decisions being made with consequential

impacts on environmental, social and economic matters. It is essential therefore to recognise a) the potential effects of leakage, and b) clarify long-term responsibilities and liabilities.

### **a. Potential effects**

Of primary concern to the community is – what happens if a CCS project fails and there is a leak? In addition to increasing CO<sub>2</sub> amounts in the atmosphere and thus defeating the purpose for which the GHG is stored, there is an array of known, and more importantly unknown, consequences which may arise from GHG leakage.

Since the industrial revolution the oceans have been subjected to enormous amounts of GHG exposure, with scientists claiming half the fossil fuel carbon dioxide released into the atmosphere by humans has now dissolved in the oceans. Recent studies are beginning to demonstrate that this CO<sub>2</sub> inundation is resulting in ocean acidification<sup>3</sup>. “For sea life with fragile shells, corals and countless other sea creatures, a more acidic ocean could be disastrous and have unknown impacts right up the marine food chain”<sup>4</sup>. Further carbon dioxide inputs through leaks in GHG storage sites, have the potential to extensively impact upon global biological marine system dynamics.

Threats also exist from CCS on a local level; an example being the Lake Nyos event in Cameroon in 1986 in which 1 240 000 tonnes of CO<sub>2</sub> was released over a period of four and a half hours killed 1700 people, 3500 livestock, and cleared most vegetation in close proximity to the lake. The current Bill stipulates that for a site to be classified an “eligible greenhouse gas storage formation”<sup>5</sup>, it must be able to store 100,000 tonnes<sup>6</sup> of CO<sub>2</sub>, making the possibility of large escapes such as these, a real concern. Additional threats accompany the use of man-made storage sites; “the main risk from man-made CO<sub>2</sub> storage sites that does not have any close analogy in nature is considered to be a well blowout”<sup>7</sup>.

We acknowledge that CCS projects are being trialled already in Australia and have been in existence overseas for some years. We are not however aware of any truly long-term projects that definitively prove CCS is safe and permanent (ie, trials over a number decades at least).

### **b. Liability**

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<sup>3</sup> The term ‘ocean acidification’ refers to the fact that the CO<sub>2</sub> forms a weak acid (carbonic acid) in water, making the ocean more acidic. The basic chemistry is as follows: the ocean is a weakly-alkaline solution (with a pH of ~ 8.1), but this extra CO<sub>2</sub> changes the carbonate chemistry of the surface ocean and drives the ocean pH lower, meaning that the ocean is becoming more acidic (less alkaline).

<sup>4</sup> ‘Putting sea life to the acid test’, *The Sydney Morning Herald*, 7 June, 2008.

<sup>5</sup> See s 15B.

<sup>6</sup> See s 15B(2).

<sup>7</sup> Holloway, S., Pearce, J. M., Hards, V. L., Ohsumi, T. & Gale, J. 2007, ‘Natural emissions of CO<sub>2</sub> from the geosphere and their bearing on the geological storage of carbon dioxide’, *Energy*, vol 32, no 7, pp 1194-1201.

The key related concern is – who is liable for ongoing assessment and if a leak occurs?

ANEDO submits that the Bill, in its attempt to clarify “legal certainty for access and property rights” fails to adequately articulate the liabilities and responsibilities of the potential multiple parties<sup>8</sup> involved in the CCS process. The clarification of responsibilities, particularly in regard to long term monitoring, measurement and verification (MMV) of the storage sites once they are sealed, is undoubtedly one of the overwhelming concerns that needs to be addressed when attempting to make CCS both financially viable and environmentally responsible.

“There is a need to clarify who owns the CO<sub>2</sub> as this may have implications to legislation and liability.”<sup>9</sup>

It is also essential that the Bill be amended to identify those parties liable for events such as “serious situations”<sup>10</sup> which may occur during the injection stage, in addition to the long-term liabilities that may arise from the geological formations once injection activities have ceased. In terms of liability, the most important property right that needs addressing in the Bill is property in the CO<sub>2</sub>; unfortunately the Bill fails to provide guidance in regard to this aspect.

The potential liabilities that arise from CCS operations will be divided into the areas of statutory and common law: firstly the statutory responsibilities of the operator that exist under the *Offshore Petroleum Act 2006*, and secondly the common law liabilities of the licence holder, or another person involved in the project, that exists for someone who has suffered injury or loss as a result of the migration or escape of the carbon dioxide<sup>11</sup>.

#### *i) Statutory Liability and Responsibilities*

The Bill, in its attempt to limit long term responsibility, and subsequently statutory liability, has provided those parties conducting GHG injection and storage a legislative mechanism to prevent ongoing statutory liability. This statutory cap comes in the form of a Site Closing Certificate (SCC): “A greenhouse gas injection licensee may apply to the responsible Commonwealth Minister for a

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<sup>8</sup> Parties include participants of the CCS project (including their contractors and consultants), the owner of the carbon dioxide, the underlying land owner, governments and regulatory authorities, third parties unconnected with the activities.

<sup>9</sup> Comments by Dr Peter J. Cook on behalf of the Cooperative Research Centre for Greenhouse Gas Technologies. Available at: [http://www.dpi.vic.gov.au/DPI/dpinenergy.nsf/LinkView/76003ADEA439E2F4CA25743200027AC84CAC723B1D538D66CA25740C000D2004/\\$file/Dr%20Peter%20J%20Cook.pdf](http://www.dpi.vic.gov.au/DPI/dpinenergy.nsf/LinkView/76003ADEA439E2F4CA25743200027AC84CAC723B1D538D66CA25740C000D2004/$file/Dr%20Peter%20J%20Cook.pdf)

<sup>10</sup> See s 249CZ Serious Situations.

<sup>11</sup> Australian Government Solicitor, “Responsibility and Liability for Greenhouse Gas Injection and Storage Activities Authorised under and amended *Offshore Petroleum Act 2006*”.

site closing certificate”<sup>12</sup>. This application to the Minister must, amongst other things, contain:

“the applicant’s suggestion for the approach to be taken by the Commonwealth, after the issue of the certificate, to the monitoring of the behaviour of a greenhouse gas substance stored in the identified greenhouse gas storage formation”<sup>13</sup>.

The above section indicates that responsibility for MMV lies with the Commonwealth following the issue of a SCC. Prior to a SCC being issued, “the responsible Commonwealth Minister may give the applicant a written notice (called a *pre-certificate notice*) telling the applicant that the responsible Commonwealth Minister is prepared to issue a site closing certificate”<sup>14</sup>.

In terms of delegation of responsibility, the application for a pre-certificate notice must:

“specify a program of operations proposed to be carried out by the Commonwealth for the purposes of monitoring the behaviour of a greenhouse gas substance stored in the identified greenhouse gas storage formation concerned”<sup>15</sup>.

Additionally, the applicant must set out an “estimate of total costs and expenses of carrying out the program”<sup>16</sup>, the “form and amount of a security to be lodged by the applicant in respect of the compliance”<sup>17</sup> and “a statement to the effect that the application will lapse if the applicant does not lodge the security”<sup>18</sup>. However, the Bill does not specify the nature of the security required.

The above sections appear to indicate that following the issue of a SCC, the Commonwealth will be responsible for the ongoing monitoring of the site. However it fails to provide a mandatory period for which the monitoring of the site will continue<sup>19</sup>. The Bill also provides that if the Commonwealth “incurs reasonable costs or expenses in carrying out the program specified in the pre-certificate notice for the site closing certificate”<sup>20</sup>, these costs or expenses “are a debt due to the Commonwealth by the holder of the certificate”<sup>21</sup>. There is no guidance as to who will be liable for such expenditure if the entity that holds the SCC no longer exists, nor, as noted above, is there any indication how long the Commonwealth must maintain such monitoring activities. Further, there is no provision allowing the Commonwealth to access the “security” in satisfaction of the debt.

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<sup>12</sup> See s 249CZE Application for site closing certificates.

<sup>13</sup> See s 249CZE (2)(c).

<sup>14</sup> See s 249CZF (1).

<sup>15</sup> See s 249CZGAA Pre-certificate notice – security etc.

<sup>16</sup> See s 249CZGAA (1)(b).

<sup>17</sup> See s 249CZGAA (1)(c).

<sup>18</sup> See s 249CZGAA (1)(d).

<sup>19</sup> Addressed in more detail below.

<sup>20</sup> See s 249CZM (1)(b).

<sup>21</sup> See s 249CZM (2).

The fact that a SCC “remains in force indefinitely”<sup>22</sup> seems to further distance the applicant’s responsibilities following the issuing of an SCC.

Whilst the issuing of a SCC may provide industry with the confidence to invest in CCS, it simultaneously increases the potential of public liability. Once a SCC is granted, the recipient is no longer responsible for the ongoing monitoring, measurement and verification and so provides the operator with a limitation point for further statutory liability and financial responsibility. ANEDO is of the view that by providing industry such assurances, the Bill establishes a framework that operates counter to the public interest of ongoing monitoring and site stability to ensure effective long-term GHG storage. ANEDO is also concerned that following the issuing of an SCC, the immediate transfer to the Commonwealth of responsibility for long term site MMV may reduce incentives for project operators to design and implement projects in a safe and reliable manner.

To assist in removing the uncertainty of responsibility, ANEDO recommends that the Bill clearly identify with whom the ownership of the injected carbon dioxide falls. This is fundamental to ensuring issues concerning environmental contamination and remediation is adequately addressed.

Additionally, ANEDO recommends that due to the infancy of the technology, lack of scientific understanding and knowledge of environmental impacts, the Bill should be amended to clearly stipulate an ongoing inspection schedule and time period for which ongoing site specific MMV should continue (addressed in more detail below).

Finally, ANEDO recommends that the various long and short term liabilities of the operator and Commonwealth be clearly identified in the Bill. These should include the ability of the Commonwealth to access the security in satisfaction of the debt incurred. Further, the nature of the security should be defined as an immediately enforceable asset such as a bank guarantee, letter of credit or the like.

#### *ii) Common Law Liability*

“The *Offshore Petroleum Act 2006* does not exclude, limit or allocate common law liability of petroleum title-holders or others engaged in offshore petroleum operations. Common law liability lies where it falls... The GHG amendments to the OPA will extend this same treatment of responsibility and liability to offshore GHG operations”<sup>23</sup>.

Potential common law liabilities that could arise in connection with the CCS process include inter alia nuisance, trespass, negligence, breach of a statutory duty,

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<sup>22</sup> See s 249CZJ (1).

<sup>23</sup> Responsibility and Liability for Greenhouse Gas Injection and Storage Activities Authorised under an Amended *Offshore Petroleum Act 2006*, available at <http://www.aph.gov.au/house/committee/pir/exposedraft/back/back08.pdf>.

liability under the doctrine of waste, liability for breach of contract, and vicarious liability for the actions of others. Asked who would be liable for a leak from a sequestration field, Mr Ferguson said his legislation “envisaged such issues being dealt with under common law.”<sup>24</sup> ANEDO submits that common law principles should continue to apply to liability issues throughout all stages of the CCS project. However, the liabilities associated with CCS are novel and require further guidance through legislative mechanisms, as the timeframes required in safely storing CO<sub>2</sub> are potentially thousands of years.

Situations are likely to arise whereby the corporations directly responsible for causing damage may no longer exist. The Bill provides no clarification for the process to be undertaken in such a situation, which seems to suggest that the default responsibility will again fall to the Commonwealth. The report by the Australian Government Solicitor provides the contradictory statements that “Commonwealth will not take over long-term liability from project participants” but that “in the long term, the risk will, in a sense, pass to the community”<sup>25</sup>.

The reality of this situation is that the long term liability for emissions released by industry from inadequate CCS sites will ultimately fall with the public. As such, ANEDO submits that the Bill should introduce an industry funded, Commonwealth held trust to ensure funds are available for future remediation works in the event that the party liable are no longer in existence.

## **2. Absence of objects and fundamental environmental principles**

The Bill contains no specified additional objects. There is no requirement for GHG injection and storage operations to be consistent with the principles of ecologically sustainable development (ESD), or recognise community concerns. CCS is by no means a proven method through which to permanently store GHGs; this reality alone provides sufficient cause for the Bill to contain the principles of ESD.

The Precautionary Principle in the context of environmental protection essentially pertains to the management of scientific risk.

“Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.”<sup>26</sup>

Here scientific uncertainty exists around the long term storage capacity of GHGs, and the effects of CO<sub>2</sub> leakage on matters such as deep sea ecology and other marine systems as noted above. Additionally, it is unrealistic to assume that all the gas injected is 100% CO<sub>2</sub>, and the Bill allows for such impurities to be included in

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<sup>24</sup> Franklin, M. 2008, ‘Seabed plan to capture carbon’, *The Australian*, 7 June.

<sup>25</sup> Australian Government Solicitor, “Responsibility and Liability for Greenhouse Gas Injection and Storage Activities Authorised under and amended *Offshore Petroleum Act 2006*”.

<sup>26</sup> United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 1992.

the injected substance<sup>27</sup>. However the injection of associated gases may be accompanied by unforeseen environmental consequences, providing further reason for the Bill to incorporate a precautionary approach. It is important therefore that the regulatory regime proposed by the Bill contain rigorous safeguards to manage the unknown impacts associated with CCS. Such safeguards should include the undertaking of extensive environmental impact assessments, and the establishment of an industry funded, Commonwealth held remediation trust.

Another element of ESD is the principle of Intergenerational Equity, which is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”<sup>28</sup>. For CCS to effectively remove GHGs from the air, it is essential that the emissions remain at the site where they are injected. The leakage of GHG’s from a storage site not only renders the entire expensive CCS operation redundant, it additionally provides an environmental burden for future generations. ANEDO therefore submits that the incorporation of the principles of ESD into the objects of the Bill is essential to demonstrate that all CCS operations be conducted in an ecologically sustainable manner.

### **3. Insufficient monitoring, measurement and verification following the cessation of CCS operations**

As noted, one of the major community concerns with the CCS process will be whether the sites will retain those amounts of GHG injected in perpetuity.

The Bill does require that a “program of operation proposed to be carried out by the Commonwealth for the purposes of monitoring the behaviour of a greenhouse gas substance stored in the identified greenhouse gas storage formation concerned”<sup>29</sup> be provided by the operator. The Bill also requires that an operator make financial provisions in the form of a security for a program of post site closure monitoring and verification.

The Bill does not however stipulate a mandatory period for which MMV should continue, nor prescribe what that MMV should entail. ANEDO submits that the Bill should be amended to include a mandatory 60 year period of MMV to be conducted by the operator once CCS operations have ceased. As highlighted above, concerns exist that following the issuing of an SCC, the immediate transfer to the Commonwealth of responsibility for long term site monitoring may reduce incentives for project operators to design and implement projects in a safe and reliable manner. The incorporation of a 60 year MMV program conducted by the operator may assist in addressing these concerns and goes some way to protecting the environment for future generations.

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<sup>27</sup> See s 15D.

<sup>28</sup> World Commission on Environment and Development 1990, *Our Common Future*, Australian edn, Oxford University Press, Melbourne, p.85.

<sup>29</sup> See s 249CZGAA (1)(a).

There will be varying degrees of structural integrity for each of the sites used for CCS, and therefore there should be varying degrees of MMV required. To address this fact, ANEDO submits that the formulation of an independent committee to review the MMV program proposed by an operator, be incorporated into the Bill. Such a committee should consist of a panel of accredited independent experts with scientific expertise in fields related to the CCS process and environmental impact assessments. This would assist in ensuring that the program proposed by the operator is suitable to the individual characteristics of each site. It additionally brings independence and scientific credibility to the program proposed by the operator.

ANEDO suggests that once this 60 year period of MMV has passed, the MMV duties and liabilities pass to the Commonwealth. Financial provisions for this scheme would come in the form of an industry funded Commonwealth held trust, that accrues interest at a rate to ensure both MMV operations continue, in addition to providing a fund from which remediation works can be conducted should it become necessary to do so.<sup>30</sup>

#### **4. The lack of site criteria for an “eligible” and “identified” greenhouse gas storage formation**

One of the major concerns of the CCS process is the potential structural instability of the geological formations in which the GHGs will be stored. To decrease the likelihood of leakage, the Bill should establish site criteria to ensure only optimal sites are declared “identified greenhouse gas storage formations”. The envisaged GHG storage structures are either naturally occurring geological formations or man-made storage sites. The responsible Commonwealth Minister may declare a site an “identified greenhouse gas storage formation”<sup>31</sup> as long as it is an “eligible greenhouse gas storage formation”<sup>32</sup>. The Bill states that for a site to be declared an “eligible greenhouse gas storage formation” it must be “suitable” with or without “engineering enhancements” for the “permanent storage” of at least 100,000 tonnes of a greenhouse gas substance<sup>33</sup>.

The “fundamental suitability determinants” for a site are outlined in section 15B (8) are vague and not mandatory, as the applicant, through written notice to the Minister, can vary “any or all of the fundamental suitability determinants”<sup>34</sup>.

ANEDO submits that the process through which the fundamental suitability requirements are ascertained, should be much more prescriptive. An example of the appropriate detail recommended to identify a suitable site can be observed in

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<sup>30</sup> Precedents have been established for trust funds to pay for long term management, for example, to finance management payments in perpetuity under the NSW Biobanking scheme under the *Threatened Species Conservation Act 1995*.

<sup>31</sup> See s 249AU.

<sup>32</sup> See s 15B.

<sup>33</sup> See s 15B (1).

<sup>34</sup> See s 249AU (6)(a).

the following paragraph from the USEPA Proposed Rulemaking on Geological Sequestration of Carbon Dioxide:

“A site characterization should include a geophysical, geomechanical, geochemical and hydrogeologic evaluation of the geologic confinement system, including an evaluation of all existing information on all geologic strata overlying the geologic confinement system including the capillary entry pressure and other immediate caprock confinement characteristics as well as the characteristics of other caprocks if included in the confinement system, and all designated subsurface monitoring zones. The evaluation shall include geophysical data and assessments of any regional tectonic activity, local seismicity and regional or local fault zones, and a comprehensive description of local and regional structural or stratigraphic features. The evaluation should include a description of mechanisms of geologic confinement, including but not limited to rock properties, regional pressure gradients, hydrogeological characteristics, structural features, and absorption characteristics or geochemical reaction/mineralization processes, with regard to the ability of that confinement to prevent migration of CO<sub>2</sub> beyond the proposed geologic confinement system.”

Assessments of sites that have regard to the above criteria would undoubtedly increase the success rate for permanently retaining the injected CO<sub>2</sub>. Assessment of site suitability should be conducted by an independent body similar to that suggested above.

Additionally the inclusion of a definition of “permanent storage” needs to be incorporated into the Bill to again assist in identifying appropriate sites for GHG storage. ANEDO submits, in accordance with findings by the IPCC, that a reasonable standard for permanence would call for “a site capable of sequestering approximately 99% of the CO<sub>2</sub> in the confinement system for at least 1000 years with a high degree of confidence”.

## **5. The emphasis on Ministerial discretion, and lack of appropriate mandatory criteria to be adhered to throughout the decision making process**

ANEDO submits that in the regulatory regime proposed by the Bill, there is a distinct absence of public participation, transparency, and accountability throughout the entire CCS process. Additionally, the Bill provides minimal appropriate mandatory considerations that need to be taken into account by the Minister when granting rights associated with the process, from the Greenhouse Gas Acreage Releases<sup>35</sup>, to the granting of a Site Closing Certificate<sup>36</sup>. This is particularly apparent throughout the issuing of greenhouse gas assessment permits<sup>37</sup>, greenhouse gas injection licenses<sup>38</sup>, and site closing certificates<sup>39</sup>.

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<sup>35</sup> See sections 249AJ and 249AP.

<sup>36</sup> See s 249CZF.

<sup>37</sup> See s 249AD.

<sup>38</sup> See s 249CE (1).

<sup>39</sup> See s 249CZE.

Due to the lack of robust criteria and mandatory considerations to be taken into account by the “responsible Commonwealth Minister”, ANEDO has concerns regarding the process through which access rights are granted. Chapter 2A of the Bill sets out the “Regulation of activities relating to injection and storage of greenhouse gas substances”, and introduces the initial mechanism through which such activities are regulated; the greenhouse gas assessment permits (permits). Once granted, these permits authorise the permittee to apply for approval from the Minister to conduct ‘key greenhouse gas operations’ such as exploring potential greenhouse gas storage formations and potential injection sites.

The process for granting a greenhouse gas assessment permit is highly subjective;

“The responsible Commonwealth Minister may grant a greenhouse gas assessment permit subject to whatever conditions the responsible Commonwealth Minister thinks appropriate”<sup>40</sup>.

This is also the methodology employed when deciding whether to grant an applicant a “greenhouse gas injection license”<sup>41</sup> which authorises the licensee to carry out greenhouse injection and storage operations in the license area. As a result of the lack of mandatory considerations, transparency, public participation and accountability in this governmental decision making process, ANEDO submits that these processes be reviewed. The decision to grant an access permit should require the decision maker to have regard to such matters as potential environmental impacts, scientific and public concerns. The decision maker should at the very least be advised, if not replaced, by a panel of accredited independent experts with scientific experience in fields related to the CCS process.

Following the granting of a permit, the permittee must apply to the Minister for approval if they wish to conduct ‘key greenhouse gas operations’. There are currently four matters that the Minister ‘must have regard to’ when deciding whether to grant approval, and these are contained in s 249AF (4-8). ANEDO submits that the matters the Minister must have regard to are insufficient. The first two matters relate to the impact that any operations may have on existing or future fossil fuel operations:

- section 249AF (4) mandates that the Minister has regard to the impact that the operations could have on ‘petroleum exploration operations or petroleum recovery operations’ that are or could be carried out under the an existing or future exploration permit, retention lease, or production licence; and
- section 249AF (5 + 6) the Minister must have regard to whether the key greenhouse gas operations will have an adverse impact on petroleum exploration operations or petroleum recovery operations.

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<sup>40</sup> See s 249AE (1).

<sup>41</sup> See s 249CE (1).

This highlights the emphasis the Bill is placing on clarifying the existing and potential rights of the fossil fuel industry. It fails to address the environmental concerns and technological uncertainties that exist throughout the CCS process.

The third matter that the Minister must have regard to involves the injection and storage of substances in geological formations on an appraisal basis to ascertain whether it is appropriate for CCS purposes<sup>42</sup>. The Bill states the Minister must have regard to the ‘composition of the substance’<sup>43</sup> that is proposed to be injected; a statement that offers very little guidance. The Bill states that the substances that can be injected are air, petroleum or water<sup>44</sup> to test the appropriateness of a geological formation for GHG storage. The very purpose of the appraisal process is to identify those geological formations appropriate for storage, and those classed as inappropriate as a result of leaks and instability identified during the testing process. The Bill does not identify the procedure that is to occur should the ‘substance’ being injected (perhaps petroleum) begin to leak into the surrounding water column. A much more defined process for ‘appraisal’ operations needs to be incorporated into the Bill.

The fourth and final matter that the Minister must have regard to when deciding whether to grant approval to a permittee for a ‘key greenhouse gas operation’ is stated at s 249AF(8):

“The responsible Commonwealth Minister must have regard to the public interest”<sup>45</sup>.

There are 19 occasions throughout the Bill when reference is made to “the public interest”, however there is no definition for the phrase, or how it is assessed and weighted in terms of Ministerial discretion. ANEDO submits that this cannot be considered an adequate means of incorporating public participation into the decision making process, and therefore a definition of this phrase should be incorporated into the Bill, and include a public consultation process.

#### *Pre-certificate Notice*

An enormous emphasis on Ministerial discretion is also incorporated into the sections of the Bill that address the “Circumstances in which a pre-certificate notice may be refused.” The Bill states that the Minister *may* refuse to issue the applicant a pre-certificate notice if:

“the responsible Commonwealth Minister is satisfied that there is a significant risk that a greenhouse gas substance injected into the identified greenhouse gas storage formation will have a significant adverse impact on:

- (i) the conservation or exploitation of natural resources (whether in an offshore area or elsewhere); or

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<sup>42</sup> See s 249AD.

<sup>43</sup> See s 249AF (7).

<sup>44</sup> See s 249AD (1)(f).

<sup>45</sup> See s 249AF (8).

- (ii) the geotechnical integrity of the whole or a part of a geological formation or geological structure; or
- (iii) the environment; or
- (iv) human health or safety”<sup>46</sup>.

This section still allows the Minister to grant a pre-certificate notice, despite the knowledge that a “there is a significant risk that the greenhouse gas storage formation *will* have a significant impact on” the conservation of natural resources, the environment or human health and safety. This offends the principles of ESD, and as such ANEDO submits that the decision making process for the issuing of a pre-certificate notice should be reviewed, so as to prevent the issuing of an SCC in circumstances where a significant adverse impact on the above matters is known.

The emphasis of this legislation appears to be clarifying the rights of those parties interested in maintaining petroleum access and property rights. Whilst these are factors that need to be considered, they are not the sole factors for consideration. The approval of documents for access rights such as assessment permits and injection licenses should be conducted in such a way as to require the Minister to incorporate environmental impacts, scientific and community concerns into the decision making process for CCS activities.

## **6. The absence of an independent expert committee to evaluate and respond to community, scientific and environmental concerns**

As demonstrated above, there is an enormous focus on Ministerial discretion throughout the entire CCS decision making process. The incorporation of an independent expert committee, with the directive to collect, assess and advise on the data relating to this relatively new CCS concept, would increase the likelihood of appropriate decisions being made that more comprehensively take into account environmental and community concerns. The creation of such a committee would assist in adding independent, scientific assessment to the regulatory regime proposed by the Bill.

## **7. Transparency and accountability**

It is encouraging to note that the Bill contains the requirement for a “Register of Identified Greenhouse Gas Storage Formations” that is to be made available for inspection on the internet<sup>47</sup>. However ANEDO submits that the Bill should be amended to specifically include further information on those sites declared as identified greenhouse gas storage formations, such as refusals, variations and revocations pertaining to such declarations. The Minister’s reasons and the EIA supporting the decision to approve the process should be made public, as approved

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<sup>46</sup> See s 249CZF (4)(b)(1-iv).

<sup>47</sup> See s 249AUBA.

by the independent expert committee, along with details of the company responsible for the project.

The Bill also states that the “responsible Commonwealth Minister may, by writing, appoint a person to be a greenhouse gas project inspector” if “the Minister is satisfied that the person has the knowledge, skills and experience to be a greenhouse gas project inspector”<sup>48</sup>. Again the Bill provides the full Ministerial discretion as to what these skills, knowledge and experience should pertain to, however once appointed the greenhouse gas project inspector (the inspector) is permitted “exercise powers of access, inspection and entry for the purposes of the Act and the regulations.”<sup>49</sup> The Bill does not clarify the exact directive of such inspections however, the inspectors activities include to:

“inspect and test any equipment that has reasonable grounds to believe has been, is being or is to be used in an offshore area in connection with any of those operations”.

ANEDO suggests that such a position could be useful in communicating information to the public regarding current CCS operations. ANEDO submits that the information collected by the inspector during such activities should be made publicly available.

## **8. “No go” zones**

As noted above, ANEDO is concerned that the primary focus of the Bill is currently to clarify the rights of those parties wanting to store GHGs in relation to the existing and potential rights of others involved in the extraction and exploitation of fossil fuels. There is no reference to the potential conflicts that may arise between the pre-existing use of marine protected areas and the potential environmental impacts that could be sustained from the commencement and ongoing operation of CCS activities. For this reason, ANEDO submits that the Bill should be amended to clearly identify areas designated as “no go zones”.

The purpose of these zones is to identify areas in which any application for CCS operations, and associated infrastructure, will automatically be refused by the Minister. Additionally, due to the infancy of the technology and lack of understanding of the environmental impacts associated with CCS operations, ANEDO submits that Bill implement extensive buffer zones around marine protected areas, as identified in state or Commonwealth legislation. The Bill should be amended to additionally prohibit CCS operations from occurring in, or in close proximity to, offshore islands. As the Bill currently stands, areas such as the World Heritage Listed Lord Howe Island, and the International Union for the Conservation of Nature (IUCN) category 1a reserve of Macquarie Island, are potentially vulnerable to the impacts of CCS operations.

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<sup>48</sup> See ss 316-318.

<sup>49</sup> See ss 316-317.

## 9. Consideration of international obligations

There also needs to be considerations of international obligations before such practices can go ahead.

“Currently, there are several treaties, notably the UN Convention on the Law of the Sea (UNCLOS), and the London and OSPAR Conventions that could apply to the offshore injection of CO<sub>2</sub> into marine environments... in 2007 both the London and OSPAR Conventions underwent amendments to allow the storage of CO<sub>2</sub> in geological formations under the seabed.”<sup>50</sup>

These amendments affirmed that CO<sub>2</sub> is not classed as a pollutant and as such can, under the relevant international laws, be legally stored under the seabed. The Australian Parliamentary Committee on Treaties endorsed the Annex 1 amendments in March 2007. This reclassification of CO<sub>2</sub> should not require those states that provide for more diligent environmental practices in their offshore legislation, to abandon them in favour of a Bill that places less emphasis on environmental considerations.

## 10. Review of state based regimes and existing pilot projects

### *Liability of those operators who have already initiated CCS works*

Experimental CCS operations have already begun around the world, and Australia is no exception. Below is a table<sup>51</sup> identifying some of these various operations that are in force throughout Australia.

State	Clean Coal and/or CCS Project
Queensland	<b>1. Coal gasification &amp; CCS</b> ZeroGen Stawell Power Station, QLD <b>2. Oxy fuel &amp; CCS</b> Callide A Power Station CS Energy, Biloela, QLD <b>3. Coal Bed Methane power plant &amp; CCS Fairview Power Project</b> Injune, QLD
New South Wales	<b>4. Post Combustion Capture (PCC) Pilot Plant</b> CSIRO Energy Technology Newcastle, NSW <b>5. Ultra Clean Coal (UCC) Pilot Plant</b> White Mining Ltd. Cessnock, NSW

<sup>50</sup> Baldwin, S. 2008, ‘Carbon Capture and Storage, Briefing Paper no 2/08’, NSW Parliamentary Library Research Service.

<sup>51</sup> Baldwin, S. 2008, ‘Carbon Capture and Storage, Briefing Paper no 2/08’, NSW Parliamentary Library Research Service.

Victoria	<p><b>6. Lignite drying, gasification, coal-to-liquid &amp; CCS</b>  Sever projects in Latrobe Valley power stations  e.g. Hazelwood, Loy Yang, HRLT</p> <p><b>7. CO2CRC Otway Basin Pilot Project</b>  CO2 geosequestration  Otway Basin, VIC</p>
Western Australia	<p><b>8. Kwinana hydrogen power plant, (BP/Rio Tinto)</b>  Coal gasification, hydrogen production &amp; CCS  Perth, W.A. (<i>NB. this project has recently ceased operations</i>).</p> <p><b>9. Gorgon gas field project</b></p>

The Bill provides no clarification in terms of property rights, long term monitoring, measurement and verification, and liability issues in regard to the above pilot projects which have already initiated CCS operations. These are currently being dealt with by different regulation and arrangements in each jurisdiction.

The technology required to make carbon CCS a reality is still very much in the experimental stages with an array of logistical, technical, financial and environmental issues yet to be overcome. These problems are proving insurmountable challenges to companies such as Rio Tinto and BP, who have recently announced the discontinuation of a two billion dollar joint venture after discovering the sites envisaged for geosequestration in the Perth Basin were not stable enough to proceed further. Reliance on self regulation by industry is an insufficient method through which to approach this process and therefore the regulatory regime needs to set out robust safety measures to ensure that any CCS operations are conducted in environmentally responsible manner.

Therefore, by their very nature, some pilot projects will fail or be discontinued, and it is essential that the Bill provide liability for long term MMV and remediation of these discontinued operations, particularly where State regimes are unclear or inadequate on this issue. The Bill needs to be amended to address this issue, in addition to clarifying the rights of these operators who would undoubtedly wish to derive a benefit from their operations under the Federal Governments proposed Emissions Trading Scheme.

### *Consideration of State legislation*

In regard to State based legislation, both the *Queensland Petroleum and Gas (Protection and Safety) Act 2004* and the *South Australian Petroleum Act 2000* ‘provide for the transport by pipeline and storage in natural reservoirs of substances including carbon dioxide’. There are also a number policy documents that have been produced by some States outlining their strategies for CCS technologies, some of which are incorporated into wider ‘greenhouse policies’.

An assessment should be conducted to ensure those environmental principles included in State legislation relating to CCS activities, are not undermined. Additionally if the Bill is to be used as a federal framework once the above

concerns are addressed, it should not facilitate a lowest common denominator approach to appease all states, and associated interests. It should represent best practice.

The Bill should be introduced on a basis that States are given the opportunity for a moratorium on environmental grounds. This opportunity was afforded to the States following the introduction of the national *Gene Technology Act 2000*.<sup>52</sup> Whilst it is important that a federally consistent and coordinated model be developed to address the new technology of CCS, ANEDO submits that it is necessary to implement a model with flexibility for states to put in place moratoria or establish “no go” zones (as discussed above) on environmental grounds. Such a model would assist in ensuring those rigorous State laws that enshrine good environmental protection are not undermined by Commonwealth licensing approval.

## **Conclusion**

Finally, before an accurate assessment can be made to determine whether the Bill establishes a legislative framework that could be adopted on a national basis, the accompanying regulations and their associated impacts need to be analysed. The detail of the Bill will be in the regulations. It is therefore impossible to determine the appropriateness of the Bill for national adoption without knowledge of what the regulations contain. ANEDO submits that before the Bill is finalised, the accompanying regulations be publicly exhibited, and an opportunity be provided for public comment. Such a process will assist in ensuring consistency exists between the two instruments.

In addition, we note that the Environment Protection and Heritage Ministerial Council and the Ministerial Council on Mineral and Petroleum Resources are jointly working on environmental guidelines for CCS. These guidelines have not been completed. ANEDO strongly recommends that a) a draft of the guidelines is made available, b) that consultation is undertaken with all stakeholders on the guidelines, c) the Bill clarifies the status of the guidelines (ie, whether they are a reference only, or contain mandatory considerations), and d) the Act does not commence until the guidelines are finalised. If the guidelines are to contain mandatory considerations, ANEDO submits that it would be more appropriate to include these in the Bill itself.

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<sup>52</sup> This Act introduced a national scheme for the regulation of genetically modified organisms in Australia, whilst simultaneously providing States the opportunity to prevent such dealings from occurring within their jurisdiction.

## Summary of Recommendations

Our key recommendations are that the Bill should:

- include a defined set of objects consistent with the principles of Ecologically Sustainable Development (ESD);
- require extensive Environmental Impact Assessment prior to the issuing of any CCS operations;
- establish an independent committee to assess the site specific monitoring program required before a Site Closing Certificate is granted;
- designate “no-go zones” and extensive marine buffers for CCS operations and associated infrastructure around protected and vulnerable marine areas and islands;
- afford the States an opportunity for imposing a moratorium on environmental grounds;
- establish a Commonwealth held trust funded by those conducting GHG injection and storage operations for the purpose of funding ongoing MMV and remediation activities;
- set out guidelines for regarding the appropriate method to conduct injection and storage of GHGs on an “appraisal basis”;
- clarify the responsibilities and liabilities of those parties already conducting pilot CCS projects;
- include a mandatory publicly accessible CCS register;
- establish rigid site criteria to ensure only optimal sites are declared “identified greenhouse gas storage formations”;
- include increased reporting requirements;
- include definitions for “permanent storage” and “public interest”;
- more clearly define the long term liability of operators and the Commonwealth;
- identify property rights in the CO<sub>2</sub> sequestered;
- provide more rigorous criteria to define what matters need to be considered by the Minister when granting access rights;
- set out a mandatory reporting period and structure following a Site Closing Certificate being issued; and

- require that the accompanying regulations and environmental guidelines should be released for public exhibition and comment prior to the Bill being finalised.