



## Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008

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## Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008

**Date introduced:** 18 June 2008

**House:** House of Representatives

**Portfolio:** Resource, Energy and Tourism

**Commencement:** There are a large number of different commencement dates for various provisions of the Bill, and these are detailed in clause 2 of the Bill. However, Schedule 1, which is the focus of this Digest, will commence the day after Royal Assent.<sup>1</sup>

**Links:** The [relevant links](#) to the Bill, Explanatory Memorandum and second reading speech can be accessed via BillsNet, which is at <http://www.aph.gov.au/bills/>. When Bills have been passed they can be found at ComLaw, which is at <http://www.comlaw.gov.au/>.

**This Bills Digest does not take the House of Representatives amendments into account.**

### Purpose

The Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008 (the Bill) amends the *Offshore Petroleum Act 2006* (the Act) to create a legislative regime for the potential geosequestration of greenhouse gases in suitable geological formations in the seabed under Commonwealth waters.<sup>2</sup> In particular, the Bill regulates:

- the exploration, assessment and testing of geological formations and the transportation to, and storage of greenhouse gases in, such formations, and
- potential conflicts between current and future offshore petroleum operations and titles and current and future geosequestration operations and titles.

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1. This is because item 32 of Schedule 1 of the *Offshore Petroleum Amendment (Miscellaneous Measures) Act 2008* commenced on 1 July 2008.

2. See Ferguson, M, Minister for Resources, Energy and Tourism, 'Second Reading Speech: Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008', House of Representatives, *Hansard*, 18 June 2008, p. 5132.

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## Background

Please note that an explanation of the science and technology behind geosequestration is in Appendix 1 of this Digest.

### Basis of policy commitment

In 2003, Australia became a founding member of the Carbon Sequestration Leadership Forum (the CSLR), which was an international group of governments, non government organisations, industry and researchers collaborating on carbon capture and storage (CCS).<sup>3</sup>

In 2005, the Ministerial Council on Mineral and Petroleum Resources (the MCMPR) endorsed a set of regulatory principles relating to CCS in Australia<sup>4</sup> and according to the Government:

The aim of the Regulatory Guiding Principles was to achieve a nationally-consistent framework for CCS activities in each Australian jurisdiction.

Six key issues were seen as fundamental to a CCS regulatory framework:

- assessment and approvals processes
- access and property rights
- transportation issues
- monitoring and verification
- liability and post-closure responsibilities
- financial issues.<sup>5</sup>

In August 2007, the House of Representatives Standing Committee on Science and Innovation (the Science and Innovation Committee) published a report from its inquiry

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3. Standing Committee on Science and Innovation, *Between a rock and a hard place: the science of geosequestration*, House of Representatives, August 2007, Canberra, p. 16. The term 'greenhouse gas storage' will be used synonymously with 'CCS' throughout this Digest.
  4. Standing Committee on Science and Innovation, op. cit., p. 18; M. Ferguson, Minister for Resources, Energy and Tourism, op. cit., p. 5133.
  5. Department of Resources, Energy and Tourism, 'CCS Legislation', [http://www.ret.gov.au/resources/carbon\\_dioxide\\_capture\\_and\\_geological\\_storage/Pages/ccs\\_legislation.aspx](http://www.ret.gov.au/resources/carbon_dioxide_capture_and_geological_storage/Pages/ccs_legislation.aspx), accessed on 4 August 2008.

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into the science and economics of CCS.<sup>6</sup> The Science and Innovation Committee concluded that CCS technology would potentially be important in the global effort to reduce carbon dioxide emissions.<sup>7</sup> In order to realise that potential, the Science and Innovation Committee emphasised the importance of encouraging investor confidence in undertaking large scale CCS activities and recommended that Commonwealth, State and Territory governments should develop appropriate legislative and regulatory CCS frameworks.<sup>8</sup>

Following consultation with industry stakeholders,<sup>9</sup> it was decided that the Act would be the most appropriate means of implementing a greenhouse gas storage regime in offshore areas.<sup>10</sup> This decision was made on the basis of a belief that the longstanding petroleum and emerging greenhouse gas storage industries have similarities and would be able to co-exist in offshore areas.<sup>11</sup>

Greenhouse gas storage or CCS is administered by the Department of Resources, Energy and Tourism (DRET).<sup>12</sup> According to DRET:

CCS is one of many options which the Australian Government is pursuing to help Australia and the world reduce greenhouse gas emissions. The Australian

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6. Standing Committee on Science and Innovation, op. cit.
  7. *ibid.*, p. ix.
  8. *ibid.*, pp. ix-xii.
  9. For information regarding previous consultations with industry stakeholders, see MCMPR, *Carbon Dioxide Capture and Storage: Australian Regulatory Guiding Principles*, Canberra, 2005, pp. 53-63; Regulatory Impact Statement, Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008, pp. 4-6; Standing Committee on Science and Innovation, op. cit., Appendix A, <http://www.aph.gov.au/house/committee/scin/geosequestration/report/fullreport.pdf>, accessed on 4 August 2008.
  10. M. Ferguson, Minister for Resources, Energy and Tourism, op. cit., p. 5133. See also MCMPR, op. cit., pp. 4-5. See also Department of Resources, Energy and Tourism, 'CCS Legislation', op. cit.,
  11. M. Ferguson, Minister for Resources, Energy and Tourism, op. cit., p. 5133; Standing Committee on Primary Industries and Resources, *Down Under: Greenhouse Gas Storage: Review of the draft Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008*, House of Representatives, Canberra, August 2008, pp. 3, 11.
  12. Department of Resources, Energy and Tourism, 'Carbon Dioxide Capture and Geological Storage', See [http://www.ret.gov.au/resources/carbon\\_dioxide\\_capture\\_and\\_geological\\_storage/Pages/CarbonDioxideCaptureandGeologicalStorage.aspx](http://www.ret.gov.au/resources/carbon_dioxide_capture_and_geological_storage/Pages/CarbonDioxideCaptureandGeologicalStorage.aspx), accessed on 4 August 2008.

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Government is committed to developing these technologies within both the domestic and international spheres.<sup>13</sup>

### Offshore Petroleum Act 2006

The Act replaced the *Petroleum (Submerged Lands) Act 1967* (the PSLA), which had been the primary Commonwealth legislation for the administration of Australia's offshore petroleum resources for almost 40 years and, through age and many amendments, had become complex and unwieldy.<sup>14</sup>

The PSLA and associated Acts provided the legal framework within which petroleum exploration, development and production activity occurred in Australia beyond the State coastal waters,<sup>15</sup> setting out a basic framework of rights, entitlements and responsibilities of Government and industry.<sup>16</sup>

The Act was not intended to introduce any major policy or legal changes to regulatory arrangements existing at the time.<sup>17</sup>

### Committee Inquiries

#### House of Representatives Standing Committee on Primary Industries and Resources

The Exposure Draft of the Bill was referred to the House of Representatives Standing Committee on Primary Industries and Resources on 19 May 2008 for inquiry and report. The Committee's [Report](#)<sup>18</sup> was tabled on 15 August 2008 and its major recommendations are listed in Appendix 1 of this Digest.

Submissions were made to the House of Representatives Standing Committee on Primary Industries and Resources in relation to its Exposure Draft inquiry.<sup>19</sup>

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13. *ibid.*

14. A. Martyn, 'Offshore Petroleum Bill 2005', *Bills Digest*, Parliamentary Library, Canberra, no. 27, 2005-06, p. 2.

15. As to 'coastal waters' and 'designated coastal waters' see *Offshore Petroleum Act 2006* sections 6, 354 respectively.

16. A. Martyn, *op. cit.*

17. *ibid.*

18. Standing Committee on Primary Industries and Resources, *op. cit.*

19. Australian Network of Environmental Defender's Offices (ANEDO), *Submission*, June 2008; Australian Petroleum Production & Exploration Association Ltd. (APPEA), *Submission*, July 2008; Cooperative Research Centre for Greenhouse Gas Technology (CO2CRC), *Submission*, 19 June 2008; Woodside Energy Ltd. (Woodside), *Submission*, 4 July 2008; BP Australasia Pty. Ltd. (BP), *Submission*, 30 June 2008; Monash Energy, *Submission*, 30 June 2008; Chevron Australia Pty. Ltd. (Chevron), *Submission*, 30 June 2008.

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In general, the submissions expressed the following concerns about the Exposure Draft:

- there are disincentives to future investment in greenhouse gas storage due to uncertainty of risk created by:
  - unequal access to existing acreages due to factors such as the alleged power of veto by pre-existing petroleum title holders
  - insufficient protection of greenhouse gas titles once obtained, and
  - potential long term liability of greenhouse gas title holders and failure of the Government to assume such liability
- insufficient definitions of ‘serious risk’ and ‘serious adverse impact’ results in inability of stakeholders to fully understand on what basis the Minister would be making decisions regarding matters such as release of acreages and protection of titles
- there is insufficient information about how public interest considerations will be accommodated by the Bill
- a lack of proper consultation regarding the Bill — much of the detail of how the greenhouse gas storage regime would operate has been left to regulations that have not yet been made — some stakeholders have said that they do not have sufficient information to make informed opinions about the Bill
- expansive discretionary powers of the Minister
- insufficient information as to whether, and if so how, the Minister would use industry expertise when making decisions under the Bill, and
- lack of clarity regarding the extent of consultations that may be undertaken under the Bill.

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2008; Anglo Coal, *Submission*, 4 July 2008; Energy Supply Association of Australia (essa), *Submission*, 4 July 2008; WWF Australia, *Submission*, 2 July 2008; Department of Industry and Resources (WA), *Submission*, 30 June 2008; Rio Tinto Australia, (Rio Tinto), *Submission*, 30 June 2008; Victorian Government, *Submission*, June 2008; Australian Energy Company Ltd. (AEC), *Submission*, 27 June 2008; Loy Yang Power Management Pty. Ltd. (Loy Yang), *Submission*, 30 June 2008; Santos Ltd., *Submission*, 26 June 2008; National Generation Forum (NGF), *Submission*, 30 June 2008; Strike Oil Ltd., *Submission*, 30 June 2008; Attorney-General’s Department (Cth), *Submission*, 26 June 2008; ExxonMobil Australia Pty. Ltd. (ExxonMobil), *Submission*, 30 June 2008; Schlumberger Carbon Services (Schlumberger), *Submission*, 30 June 2008; Australian Coal Association and Minerals Council of Australia, *Submission*, July 2008. For extracts of oral evidence given during the inquiry by the House of Representatives Standing Committee on Primary Industries and Resources, see Standing Committee on Primary Industries and Resources, *op. cit.*

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It has been stated that there is very little difference between the Exposure Draft to the Bill and the Bill.<sup>20</sup> Consequently, the concerns expressed in those submissions would be equally relevant to the Bill.

Details of the inquiry into the Exposure Draft can be found at:

<http://www.aph.gov.au/house/committee/pir/exposedraft/index.htm>.

### Senate Standing Committee on Economics

The Bill itself was referred to the Senate Standing Committee on Economics for inquiry and [the report](#) was tabled on 23 September 2008 (the Bill Inquiry).

To date there have been 15 submissions to this current inquiry on the Bill, many of whom had made submissions to the House of Representatives Committee Inquiry. There are 13 agencies that have made submissions to both inquiries.<sup>21</sup>

Details of the inquiry into the Bill can be found at:

[http://www.aph.gov.au/senate/committee/economics\\_ctte/offshore\\_petrol\\_08/info.htm](http://www.aph.gov.au/senate/committee/economics_ctte/offshore_petrol_08/info.htm).

### Senate Standing Committee for the Scrutiny of Bills

In addition, the Bill was reviewed by the Senate Standing Committee on the Scrutiny of Bills (the Scrutiny of Bills Committee) and was reported upon in the [Alert Digest](#) published 25 June 2008.<sup>22</sup> Some of the concerns expressed by the Scrutiny of Bills Committee will be discussed in the Main Provisions section of this Digest.

## Australia's international law obligations

There are number of international instruments of general application to which Australian is a Party that place restrictions and conditions on the use of the seabed and subsoil within

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20. Telephone conversations with staff of the Attorney-General's Department and the Department of Resources, Energy and Tourism.

21. The closing date for submissions was 26 August 2008. Submissions to the Senate Standing Committee for Economics inquiry into the Bill may be found at: [http://www.aph.gov.au/senate/committee/economics\\_ctte/offshore\\_petrol\\_08/submissions/sublist.htm](http://www.aph.gov.au/senate/committee/economics_ctte/offshore_petrol_08/submissions/sublist.htm), accessed on 17 September 2008.

22. Senate Standing Committee on the Scrutiny of Bills, *Alert Digest*, Canberra, no. 6, 25 June 2008.

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our claimable continental shelf. These include *United Nations Convention on the Law of the Sea 1982* (UNCLOS) and various regional agreements. However, the most directly relevant instruments are the *Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter 1972* (London Convention)<sup>23</sup> and the *Protocol to the London Convention 1996* (London Protocol).<sup>24</sup>

## London Convention and the London Protocol

Australia is a Party to both instruments.

The London Convention and the London Protocol control and regulate the deliberate disposal of wastes at sea and are intended to:

prevent the indiscriminate disposal at sea of materials and wastes that may be harmful to human health, living resources and marine life, or which may damage amenities, or interfere with other legitimate uses of the sea.<sup>25</sup>

However, while the London Convention regulates dumping, the London Protocol ‘seeks to prevent, reduce, and where practicable eliminate pollution, and adopts the precautionary approach as a general obligation’.<sup>26</sup>

Both the London Convention and the London Protocol define dumping as:

any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea.<sup>27</sup>

It is unclear whether this definition will include pipeline discharges direct from land-based sources. It has also been suggested that the transportation of CO<sub>2</sub> by pipeline from a land-

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23 *International Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter*, opened for signature 29 December 1972, [\[1985\] ATS 16](#), entered into force 30 August 1975.

24 *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29 December 1972*, opened for signature 7 November 1996, [\[2006\] ATS 11](#), entered into force 24 March 2006.

25 J. McLaren and J. Fahey, ‘Key legal and regulatory considerations for the geosequestration of carbon dioxide in Australia’, *Australian Mining and Petroleum Law Journal*, vol. 24, 2005, p. 65.

26 R. Purdy, ‘The Legal Implications of Carbon Capture and Storage’, *Sustainable Development Law and Policy Journal*, vol. 22, 2006-2007, p. 24.

27 London Convention, article 3; London Protocol, article 1.

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based course direct to sub-sea repositories will not breach international law because the Protocol ‘does not extend to sub-seabed repositories accessed only from land’.<sup>28</sup>

Parties to both the London Convention and the London Protocol are encouraged to create regional agreements that further their objectives. An example of this is the *Convention for the Protection of the Marine Environment of the North-East Atlantic 1992* (see below).<sup>29</sup>

### London Convention

The London Convention has been ratified by 82 parties, including Australia.<sup>30</sup>

The London Convention prohibits ocean dumping of wastes and other matters listed in Annex I (CO<sub>2</sub> is not included), but permits the dumping of materials listed in Annex II if a permit is issued by the country doing the dumping. Annex III lists the factors that must be considered before issuing a permit.<sup>31</sup>

### London Protocol

The London Protocol commenced on 24 March 2006 and replaces the 1972 London Convention for the 38 countries that have ratified the Protocol (of which Australia is one). The 2006 amendments to the Protocol to the London Convention specifically relating to the storage of CO<sub>2</sub> under the seabed commenced on 10 February 2007.

The London Protocol adopts a stricter legal framework for preventing ocean waste disposal than the London Convention, placing a general prohibition on the dumping of wastes, except for those wastes or matter listed in Annex 1.<sup>32</sup> The London Protocol also adopts the precautionary principle — if an action or policy might cause severe harm to the public or the environment, the proponents of that action must prove it safe rather than its opponents prove it unsafe.<sup>33</sup>

From 10 February 2007, amendments to the Protocol now allow storage of CO<sub>2</sub> under the seabed.<sup>34</sup> Australia, as a party to the Protocol (along with France, Norway and the United

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28 R. Purdy, op. cit., pp. 24-25.

29 ibid., p. 24.

30 See World Resources Institute, ‘London Protocol Adopts Amendment Allowing for Sub-seabed Carbon Dioxide Storage’, [http://pdf.wri.org/css\\_06\\_12\\_08\\_london\\_protocol.pdf](http://pdf.wri.org/css_06_12_08_london_protocol.pdf), accessed on 1 August 2008.

31 A. Weeks, ‘The Legal Implications of Carbon Capture and Storage’, *Sustainable Development Law and Policy Journal*, vol. 22, 2006-07, pp. 257-258.

32 R. Purdy, op. cit.

33 World Resources Institute, op. cit.

34 Standing Committee on Science and Innovation, op. cit., p. 90.

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Kingdom) proposed an amendment which changed Annex 1 to the Protocol to allow for the sequestration of captured carbon dioxide streams into sub-seabed geological formations.

Following the 2007 amendments, Annex 1 now includes carbon dioxide streams from carbon dioxide capture processes for sequestration as an exception to the general prohibition on dumping.<sup>35</sup> Carbon dioxide streams may only be stored if they meet the following three criteria:

- Disposal is into a sub-seabed geological formation; and
- They consist overwhelmingly of carbon dioxide. They may contain incidental associated substances derived from source material and the capture and sequestration processes used; and
- No wastes or other matter are added for the purpose of disposing of those wastes or other matter.<sup>36</sup>

Following the 2007 amendments to the London Protocol, [Guidelines](#) for sub-seabed geological sequestration of carbon dioxide were agreed to at the second meeting of the contracting parties in November 2007.<sup>37</sup>

### *Convention for the Protection of the Marine Environment of the North East Atlantic 1992 (the OSPAR Convention)*

The OSPAR Convention<sup>38</sup> is the current instrument guiding international cooperation on the protection of the marine environment in the North-East Atlantic. While this Convention is not relevant to carbon capture and storage off the coast of Australia, it underwent amendments in 2007 to allow the storage of CO<sub>2</sub> in geological formations

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35 International Maritime Organization, 'New international rules to allow storage of CO<sub>2</sub> under the seabed' *Press Briefing*, [http://www.imo.org/Newsroom/mainframe.asp?topic\\_id=1472&doc\\_id=7772](http://www.imo.org/Newsroom/mainframe.asp?topic_id=1472&doc_id=7772), accessed on 6 August 2008.

36 Submission by Australia to the First Meeting of Contracting Parties to the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972, 'CO<sub>2</sub> Sequestration in sub-seabed formations: consideration of proposals to amend Annex 1 to the London Protocol', [http://www.aph.gov.au/House/committee/jsct/co2sequestration/treaties/co2\\_text.pdf](http://www.aph.gov.au/House/committee/jsct/co2sequestration/treaties/co2_text.pdf), accessed on 1 August 2008.

37 World Resources Institute, op. cit.

38 *Convention for the Protection of the Marine Environment of the North East Atlantic 1992*, opened for signature 22 September 1992, 32 ILM 1069, entered into force 25 March 1998.

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under the seabed, thereby contributing to the international jurisprudence relating to carbon capture and storage.

## Financial implications

According to the Government, greenhouse gas title holders would incur compliance costs that are similar to those incurred by petroleum title holders.<sup>39</sup> However, the Government admits that it cannot quantify those costs in the absence of details in regulations and guidelines, which are yet to be published.<sup>40</sup>

The Government states that:

Many of the requirements of the regulator are costly but not *additional* to work which would be carried out by titleholders as a routine part of designing and executing and managing an offshore geosequestration operation...

As long as administration is directed towards minimal duplication and consistency of requirements, as is done in offshore petroleum, there should be no undue burden to preparing submissions for the regulator.<sup>41</sup>

The House of Representatives Standing Committee on Science and Innovation Committee looked at the economic costs of CCS and concluded that:

The predicted actual costs of implementing CCS technology also vary.<sup>42</sup>

...

There is also the question of what impact CCS deployment will have on electricity costs. Clean energy comes at a price but in the case of CCS, the size of a price increase is not clear.<sup>43</sup>

...

At this stage, it is extremely difficult to accurately estimate the costs of CCS. The cost estimates for CCS that are made are marked by very wide variations.<sup>44</sup>

Increased electricity costs have also been predicted by others.<sup>45</sup>

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39. Regulatory Impact Statement, *op. cit.*, p. 40.

40. *ibid.*

41. *ibid.*

42. Committee on Science and Innovation, *op. cit.*, p. xi.

43. *ibid.*

44. *ibid.*, p. 70. For a comprehensive outline of international costs estimates, see *ibid.*, Chapter 6.

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## Key Issues

### Disincentive to invest

Of primary concern is that, contrary to the stated aims of the Bill,<sup>46</sup> it is argued that a greenhouse gas storage regime, as proposed, creates a significant disincentive to invest in greenhouse gas storage operations.

Such a disincentive to invest derives largely from the uncertainty of future rights, obligations, costs and liability created by proposed provisions in the Bill.

Greenhouse gas storage operations involve new and developing, knowledge and technology and the general consensus is that such operations would be extremely expensive. Stakeholders generally submit that greenhouse gas storage proponents would be disinclined to invest such large amounts of money into operations if the prospect of receiving profitable returns is uncertain.<sup>47</sup>

Uncertainty generally relates to the themes, which are outlined below and discussed in more detail in the Main Provisions section of this Digest.

### Meshing the offshore greenhouse gas and petroleum industries

As mentioned above, the offshore petroleum and proposed greenhouse gas storage industries are closely linked, hence the decision by the Commonwealth that both industries should be regulated by the same Act.

However, as it has been pointed out, there are differences between the offshore petroleum and greenhouse gas storage industries, which must be considered.<sup>48</sup> Consequently, the challenge with proposed provisions in the Bill is how to mesh the new greenhouse gas storage industry with the existing petroleum industry framework and to manage the synergies of these competing industries without diminishing or destroying the momentum of either industry.

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45. See, for example, A. Davies, 'Technology for carbon capture remains a lot of hot, dirty air', *The Age*, 5 July 2008, p. 5; K. Macdonald, 'PM's carbon-capture dream a decade away and 40pc dearer: energy chief', *West Australian*, 28 July 2008, p. 5.

46. M. Ferguson, Minister for Resources, Energy and Tourism, *op. cit.*, p. 5132.

47. As to stakeholder submissions generally, see above, Position of stakeholders, note 74. See also Standing Committee on Primary Industries and Resources, *op. cit.*, p. vii (the Committee stated that CCS would be costly and would require a 'large financial outlay' by prospective investors — the Committee did not feel that the proposed legislation goes far enough to promote investment into greenhouse gas storage).

48. *ibid.*, p. 11 (the Committee considered that these differences are the source of potential conflict, which may delay investment in greenhouse gas storage).

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As the Standing Committee of Primary Industries and Resources stated:

The need for the co-existence of petroleum and GHG storage activities became very clear to the Committee during our deliberations. Both endeavours are in the national interest, and certain key locations in Australia's offshore waters are prime sites for both activities.<sup>49</sup>

The issue of how the proposed greenhouse gas storage regime intersects with the existing petroleum framework, and, in particular, how it deals with potential conflict between competing uses, is a key theme in the main provisions part of the Digest.

### A 'Level Playing Field'

Access to data - differing views exist about the perceived imbalance in the availability of data to existing petroleum titleholders and to new greenhouse gas titleholders. Some consider access to data a major obstacle to the development of offshore storage and when submitting work bids for acreage release.<sup>50</sup> Others consider these comments are misguided suggesting that there is sufficient publicly available data to meet the needs of both greenhouse gas and petroleum operators in identifying potential storage sites.<sup>51</sup>

Protection of petroleum titles - pre-commencement petroleum titles<sup>52</sup> are protected and petroleum titleholders virtually have a right of veto over greenhouse gas operations through the application of 'impact' tests and 'public interest' tests. **Proposed subsections 249CZC(1) and (3)** allows the Minister to issue a direction to:

- eliminate any risk of significant adverse impact under a greenhouse gas injection licence,
- suspend for a period or indefinitely any or all of the rights conferred under a greenhouse gas injection licence, and
- cancel the licence.

The Bill allows for overlapping titles but stakeholders are concerned at the lack of transparency in bidding for acreage releases, the subjective nature of the criteria<sup>53</sup> and lack

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49. *ibid.*, p. vii.

50. Bids for acreage release means the blocks or areas released by the Commonwealth Minister for exploration to allow bids by persons applying for a work-bid or cash-bid greenhouse gas assessment permits.

51. Standing Committee on Primary Industries and Resources, *op. cit.*, para. 3.29.

52. Pre-commencement titles are titles granted under the Act, prior to the commencement of the Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008.

53. In determining who is the 'most deserving', the Minister must have regard to criteria which will be set out in a publicly available determination: see **proposed subsections 249AL(2), (3), (4) and (9)**.

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of certainty in relation to post-commencement declared exploration permits, retention leases and production licences which requires Commonwealth ministerial approval to carry on key petroleum operations.

### Commonwealth–State cooperation

The Bill makes little provision for mechanisms to consult on State or Territory interests in relation to cross-jurisdictional issues should they arise.<sup>54</sup> Given that greenhouse gas injection and storage projects regulated by the Bill will take place within the Commonwealth jurisdiction, any need to consult on State/Territory interests was viewed by the Government as being addressed through more formal avenues such as the MCMPR and its subcommittees and other consultative forums.<sup>55</sup> Applications for pipeline licences are made to the Joint Authority (comprising the responsible State Minister and the responsible Commonwealth Minister) but the licence is conditional on approval by the Joint Authority of the greenhouse gas substance to be transported in that pipeline. The Commonwealth Minister can however direct the Joint Authority in relation to a decision it has made in approving or refusing a greenhouse gas substance to be conveyed by pipeline.

### Consultative processes

Proposed provisions of the Bill have been criticised for providing for only limited consultation regarding what are largely discretionary ministerial decisions made and actions performed with respect to various aspects of greenhouse gas storage operations.<sup>56</sup>

As the greenhouse gas storage industry is a relatively new and emerging industry, limited provision for consultative processes creates uncertainty particularly with respect to future rights of greenhouse gas storage proponents, as well as the technological and knowledge base development of the industry.

### Environmental impact

There is consensus that greenhouse gas storage operations, such as exploration activities, appraisal drilling, and construction of infrastructure, could potentially impact the environment.<sup>57</sup>

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54. Under the Offshore Constitutional Settlement between the Commonwealth and the States entered into in 1979, the Commonwealth Government enacted the *Coastal Waters (State Powers) Act 1980*. Under that Act, the States have concurrent power with the Commonwealth to legislate up to three miles offshore. Commonwealth laws on marine pollution and environmental protection apply outside the three mile limit. Note also that the Act refers to the Offshore Constitutional Settlement (section 4).

55. Regulatory Impact Statement, op. cit., p. 38.

56. For further discussion regarding consultative processes, see below, Main provisions, p. 40.

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The Bill contains several requirements aimed at environmental protection and conservation.<sup>58</sup>

However, it is argued that these proposals do not go far enough in environmental protection and conservation, thereby contributing to uncertainty regarding greenhouse gas storage proponents' future obligations and thereby, future costs.<sup>59</sup>

### Long term liability

Although it is recognised that adverse impacts associated with greenhouse gas storage operations may not arise or be known until many years into the future,<sup>60</sup> there is no proposed provision in the Bill expressly transferring liability to the Government once a greenhouse gas storage site is closed.<sup>61</sup>

### Ministerial decision-making

#### Expansive use of ministerial discretion

Under the Bill, the Minister has expansive discretionary power to make certain decisions and take certain action, in some cases, without provision for mandatory criteria that the Minister must consider when using his or her discretion.<sup>62</sup>

This does not reflect transparency in ministerial decision making, creating uncertainty for greenhouse gas storage proponents with respect to their rights, obligations and liabilities.

This is exacerbated by the lack of express provision in the Bill for the establishment of and/or reliance on panels or committees with appropriate expertise to advise the Minister.<sup>63</sup> It is noted that the lack of express provision for the use of experts in the Bill is not necessarily unusual and that, in such circumstances, it is common practice for the Government to rely on experts in the relevant area. However, given that greenhouse gas

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57. For detailed discussion on the environmental impact of greenhouse gas storage operations, see: IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, op. cit., pp. 12, 34-35, 197-198, 242-252; Standing Committee on Science and Innovation, op. cit., [Chapter 5](#).

58. For discussion regarding what the Bill does propose in relation to environmental impact, see below, Main provisions, p. 43.

59. See, in particular, ANEDO, op. cit.

60. See Minter Ellison, op. cit., p. 20; IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, op. cit., p. 241.

61. For further discussion regarding long term liability, see below, Main provisions, p. 44.

62. For further discussion regarding Expansive use of ministerial discretion, see below, Main provisions, p. 49.

63. For further discussion regarding Use of expert advice, see below, Main provisions, p. 50.

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storage is a new and emerging industry and that industry stakeholders have clearly expressed their interest in and concern for reliable and appropriate expert advice being relied upon in developing this new industry,<sup>64</sup> the Government may consider providing an explanation for its position regarding the use of expert advice.

#### Right of appeal

While the Bill does propose some rights of appeal, these rights are limited largely to judicial as opposed to merits review of ministerial decisions and actions.<sup>65</sup>

It is arguable that, in the context of the sort of decisions being made, judicial review is the norm. For example, this is the case with most major decisions under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).

However, some stakeholders take the view the limited appeal rights further exacerbate the lack of transparency in ministerial decision making and ensuing uncertainty for greenhouse gas storage proponents as mentioned above.<sup>66</sup>

#### Use of regulations

Many of the details of the proposed provisions in the Bill are to be found in, as yet, unpublished regulations. Consequently, stakeholders would not have sufficient information with which they can properly be consulted with regarding the Bill. This is a source of great uncertainty for stakeholders.<sup>67</sup>

#### Main provisions

Due to the comprehensive explanation of proposed amendments in the Bill by the [Explanatory Memorandum to the Bill](#), this Digest will only deal with the proposed amendments in Schedule 1 of the Bill and will do so according to issues rather than by item numbers.<sup>68</sup>

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64. See note 160.

65. For further discussion regarding Right of appeal, see below, Main provisions, p. 52.

66. See, for example, APPEA, op. cit., p. 16; Australian Coal Association and Minerals Council of Australia, op. cit., pp. 24-25.

67. For further discussion regarding Use of regulations, see below, Main provisions, p. 54.

68. The other Schedules in the Bill generally propose the following amendments:

Schedule 2 — largely consequential amendments relating to amending references made to petroleum titles in the Act, as well as to the *Offshore Petroleum (Royalty) Act 2006*

Schedule 3 — consequential amendments to other Acts relating to amending references to the title of the Act to include Greenhouse Gas Storage, and

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In addition, this Digest does not purport to cover all issues relating to nor all proposed amendments in the Bill.

### Current petroleum title regime under the Offshore Petroleum Act 2006

The current range of petroleum titles will link closely with the proposed greenhouse gas titles. The following briefly summarises the range of petroleum titles.

A petroleum *exploration permit* is granted by the Joint Authority (relevant State Minister and the Australian Government Minister) for a period of six years, with a renewal period of five years. An exploration permit can be extended if the permittee applies for a retention lease or a production licence (Part 2.1 and Part 2.2 of the Act). When petroleum is discovered the holder of the permit must notify authorities of its discovery and then apply for either a *retention lease* or a *production licence*.

A *retention lease* allows explorers to retain tenure over discoveries until they become commercial. The lease is issued for five years with a renewal period of five years (Part 2.3 of the Act). The criteria to be satisfied when applying for a retention lease is that it is not commercially viable at the time of the application but the block is likely to become commercially viable within 15 years.

A *production licence* is issued for an indefinite period (Part 2.4 of the Act).

An *infrastructure licence* (Part 2.5 of the Act) is issued to enable the construction of offshore facilities for the storage and processing of petroleum and for facilities for the recovery of petroleum in areas outside a production licence.

A *pipeline licence* (Part 2.6 of the Act) is issued to transport petroleum and is granted for an indefinite period. However the licence is terminated if no construction occurs or the licence is not used for a continuous period of at least five years.

### Amended Petroleum Titles

#### Petroleum Production Licence

**Item 125** of the Bill proposes to amend **existing section 137** of the Act to prohibit a petroleum production licensee to either inject or store a substance in a geological formation permanently or otherwise. It is the intention of the Government to:

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Schedule 4 — renumbering the new Act.

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preserve pre-existing rights of the petroleum industry as far as is practicable to minimise sovereign risk<sup>69</sup> to existing title-holders' investment in Australia's offshore resources.<sup>70</sup>

However, certain stakeholders have submitted that this provision restricts the rights that petroleum production licensees currently have under section 137. Woodside Energy Ltd comment that "in practice, this had included the authority to dispose of gas via re-injection into the production licence area and to inject gas as a means of enhanced oil recovery or enhanced gas recovery".<sup>71</sup>

## New greenhouse gas titles

### Jurisdiction

The Act, as amended by the Bill, would continue to apply only in the Commonwealth offshore jurisdiction – not within State or Territory Coastal waters.<sup>72</sup>

The new greenhouse gas titles, to be created by **proposed Chapter 2A**, generally correspond to 'equivalent' petroleum titles in the Act (titles in parentheses are the equivalent petroleum title).

### Greenhouse gas assessment permits (petroleum exploration permit)

**Proposed sections 249AC-249AS** relate to the application for and grant of assessment permits which enable the holder to explore for greenhouse gas injection and storage sites. The rights and conditions under which these permits operate are contained in **proposed sections 249AD** and **249AE**. The permit is granted for six years (**proposed section 249AH**), although an extension is available if the permit holder applies for a declaration of a 'greenhouse gas storage formation' (**proposed section 249AHA**).

### Greenhouse gas holding lease (petroleum retention lease)

**Proposed sections 249BB-249BS** relate to the application for and grant of greenhouse gas holding leases. These enable the lessee to explore the lease area for potential storage

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69 Sovereign risk is the risk of the State using its power to alter the established rights of private sector companies. For further discussion see Vigar, C, 'Parrots, politics and policy: governmental risk in energy and resources projects', 2006, MinterEllison Lawyers, <http://www.minterellison.com/public/connect/Internet/Home/Legal+Insights/Newsletters/Previous+Newsletters/A-A-Parrots,+politics+and+policy>, accessed on 12 August 2008.

70 Martin Ferguson, op. cit., p. 5133.

71 Woodside, op. cit., p. 7. See also APPEA op. cit., p. 5, ExxonMobil op. cit., p. 13.

72. These waters generally extend three nautical miles out from coastal baselines, including from habitable islands that are part of relevant State or Territory.

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formations and injection sites; and to inject and store substances to determine the suitability of sites. Conditions relating to greenhouse gas holding leases are found in **proposed section 249BC**. The criteria that apply to holding leases are that an identified greenhouse gas storage formation exists in the lease area and that the applicant is not able to commence operations immediately but is likely to be able do so within 15 years (**proposed sections 249BI, 249BO, 249BU**). The duration of a greenhouse gas holding lease is five years. A greenhouse gas holding lease cannot be extended more than once (**proposed section 249BT**). However it can be extended if the lessee applies for a special greenhouse gas holding lease (see discussion on next page) or a greenhouse gas injection licence. A special greenhouse gas holding lease remains in force indefinitely (**proposed subsection 249BF(2)**). This enables the lessee to retain tenure over a block or blocks until petroleum operations are completed.<sup>73</sup>

The Minister must take account of the following matters when considering an application from a greenhouse gas holding lessee to carry out key greenhouse gas operations:

- the potential impacts that could affect existing and future petroleum exploration or recovery operations under existing or future petroleum titles such as an exploration permits, retention leases or production licences — this applies to pre-commencement and post-commencement petroleum titles (**proposed subsection 249BD(4)**)
- if the Minister considers that there is a significant risk of significant adverse impacts, the Minister must take into account any written agreements that may exist between the petroleum title holder and the greenhouse gas applicant (**proposed subsection 249BD(5)**) — a similar provision relates to future petroleum titles over the blocks (**proposed subsection 249BD(6)**)<sup>74</sup>
- the composition of any substance being injected or stored ( **proposed subsection 249BD(7)**)
- the Minister must have regard to the public interest<sup>75</sup> (**proposed subsection 249BD(8)**) , however
- if the Commonwealth Minister is satisfied that there is significant risk that the key greenhouse gas operations will have a significant adverse impact on petroleum exploration or recovery operations being carried out under either, an existing pre-commencement petroleum title or post commencement production licence, held by someone other than the applicant , the Minister must not approve those greenhouse gas operations unless the holder of a pre-commencement or post commencement

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73 Explanatory Memorandum, Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008, p. 32.

74. However, **proposed paragraph 249BD(6)(b)** requires a current petroleum title to exist.

75 As to ‘public interest’, see below at p. 39.

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petroleum title holder has agreed in writing to the greenhouse gas operations being carried out and the Minister is satisfied with that arrangement (**proposed subsection 249BD(11)**).

### Greenhouse Injection Licence (Petroleum Production Licence)

A greenhouse gas injection licence authorises greenhouse gas injection and storage activities of greenhouse gas substances into identified greenhouse gas storage formations within the licensed area. A greenhouse gas assessment permit holder, a greenhouse gas holding lessee and a production licensee may apply for an injection licence (**proposed sections 249CH and 249CQ**). As part of the process for applying for an injection licence, the applicant must submit draft site plans to the Minister. The draft site plan (see below) forms the basis of the information that flows between the injection licensee and the Commonwealth Minister (**proposed subsection 249CH(9)**).

A greenhouse gas injection licence remains in force indefinitely, depending on the time it takes for the project to be completed (**proposed section 249CF**). However, an injection licence will be terminated if no injection operations have been carried on for five years (**proposed section 249CG**).

### Site Plans

The Bill does not specify what information is to be included in a site plan. The Explanatory Memorandum states that matters to be covered by the site plan will be contained in the regulations and be modelled on the existing 'objective based' regulations under the Act, for example the *Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996*.<sup>76</sup>

The site plan will contain details of:

- the geological attributes and features of the greenhouse gas storage formation
- current and proposed injection and storage operations
- the operations and techniques to be used by the licensee to monitor and verify the behaviour of the greenhouse gas over the life of the project
- operations management systems, including processes for identification, assessment and management of risks, and

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76 Explanatory Memorandum, Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008, p. 38.

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- predictions as to the short, medium and long term behaviour and fate of the greenhouse gas in the identified storage formation and associated geological formations.<sup>77</sup>

The site plan will be required by the regulations to be updated both periodically and whenever there is a material change in the level and kind of risk.<sup>78</sup>

### Protection of titles

The Bill proposes certain protections for pre-commencement and post commencement petroleum titles.

Pre-commencement petroleum titles are titles granted under the Act, prior to the commencement of the Bill.

Post commencement petroleum titles are defined in **proposed section 6** as including a post-commencement exploration permit, retention lease and production licence.

### Pre-commencement petroleum title holders

Discovery of petroleum in an area over which there are both pre-commencement petroleum and greenhouse gas titles held by different people

In **proposed subsection 249CZC(1)**, where a greenhouse gas injection licence area overlaps with an area covered by certain pre-commencement petroleum titles in which petroleum is discovered, the Minister must, with written notice, suspend rights conferred by the greenhouse gas injection licence; or cancel the greenhouse gas injection licence; or give directions to the greenhouse gas injection licence holder to take certain steps to eliminate risk if the Minister is satisfied that:

- the recovery of petroleum either is, or is likely to become, commercially viable
- there is a significant risk the greenhouse gas injection licence operations will have a significant adverse impact on either the recovery of the petroleum or the commercial viability of such recovery<sup>79</sup>
- it is practicable to eliminate the risk, and
- the relevant petroleum title holder has not agreed in writing to the greenhouse gas injection licence operations being carried out.

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77 *ibid.*, pp. 38-39.

78 *ibid.*, p. 39.

79. See below for further discussion on this impact test.

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A similar provision is proposed by **subsection 249CZC(3)** in relation to mitigating, managing or remediating risk in such situations.

This provision is aimed at protecting pre-commencement petroleum rights,<sup>80</sup> which has been a particularly contentious part of the Bill.<sup>81</sup>

Right of veto by pre-commencement petroleum title holders

Some stakeholders have argued that **proposed subsections 249CZC(1) and 249CZC(3)** effectively give a right of veto to pre-commencement petroleum title holders, which could affect competition, being unfairly advantageous to large petroleum companies, because some of the most suitable greenhouse gas storage sites would be located in areas where petroleum is being recovered, thereby limiting access to suitable storage areas.<sup>82</sup> Other stakeholders argue that protecting pre-commencement petroleum title rights is important.<sup>83</sup>

However, it is noted that in both of those proposed provisions, the actual power to suspend or cancel greenhouse gas titles, in the absence of consent by the relevant petroleum title holder, lies with the Minister.

It is also pointed out that at the injection and storage stage of the greenhouse gas operations, the greenhouse gas title holder would have already invested large amounts of money. The proposed provisions create uncertainty of title for greenhouse gas title holders who would suffer very substantial detriment or loss of their investment if the Minister cancels or suspends the injection of greenhouse gas.<sup>84</sup>

**Proposed subsection 442D(1)** provides that, where the operation of the Act or regulations would result in an acquisition of property from a person otherwise than on just terms, the

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80. Regulatory Impact Statement, op. cit., p. 33; Standing Committee on Primary Industries and Resources, op. cit., p. 44.

81. See, in particular, Standing Committee on Primary Industries and Resources, op. cit., pp. 43-46.

82. See CO2CRC, op. cit., pp. 5-6; Monash Energy, op. cit., pp. 26-27; Anglo Coal, op. cit., pp. 3-4; esaa, op. cit., pp. 3-4; WWF Australia, op. cit., pp. 8-9; Department of Industry and Resources (WA), op. cit., p. 3; Victorian Government, op. cit., pp. 3-4, 11; Loy Yang Power, op. cit., p. 1; Rio Tinto, op. cit., p. 7; NGF, op. cit., p. 2.

83. See APPEA, op. cit., pp. 3, 11-14.

84. See also Standing Committee on Primary Industries and Resources, op. cit., pp. 63-64 (importance of the Minister being able to direct both parties to negotiate in good faith where titles overlap), 71 (potential for conflict between pre-commencement petroleum and new greenhouse gas titleholders in a purely competitive environment may result in the implementation of greenhouse gas storage being delayed in Australia — creating certainty of investment and creating partnerships between both industries is vital).

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Government must pay a reasonable amount of compensation for that acquisition of property.<sup>85</sup>

Section 51(xxxi) of the Constitution provides that:

The Parliament shall, subject to this Constitution, have power to make laws for the peace, order, and good government of the Commonwealth with respect to:

...

the acquisition of property on just terms from any State or person for any purpose in respect of which the Parliament has power to make laws;

Section 51(xxxi) effectively ensures that all Commonwealth laws relating to the acquisition of property must provide 'just terms' to people whose property has been compulsorily acquired.<sup>86</sup> Such laws failing to provide as such would be invalid.

The question of whether the Bill proposes a right of compensation to greenhouse gas title holders who lose their investment if the Minister cancels or suspends the injection of greenhouse gas includes consideration of whether:

- there is 'property'
- the cancelling or suspension of the operations is deemed to be the acquisition of property, and
- it is an acquisition of property other than on just terms.<sup>87</sup>

The majority of the High Court has stated that:

It is well established that s 51(xxxi) of the Constitution is concerned with matters of substance rather than form and that "acquisition" and "property" are to be construed liberally.<sup>88</sup>

It has been argued that the primary question in determining whether there has been an acquisition is whether the statutory right was 'inherently susceptible to statutory modification or extinguishment' from the time the right was created. If so, then it is argued

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85. As to the meaning of 'acquisition of property' and 'just terms', see *Commonwealth of Australia Constitution Act* (the Constitution), section 51(xxxi).

86. See Brown. S, *Acquisition and statutory rights*, Paper presented at the Constitutional Law Forum 2007, AGS, 27 September 2007, p. 1.

87. See *ibid.* For High Court analysis on whether statutory rights, such as statutory petroleum titles, may be subject to an acquisition of property, see: [Commonwealth v WMC Resources Ltd.](#) [1998] HCA 8 at [14]-[17], [24] per Brennan CJ, [58]-[59] per Toohey J, [77]-[81] per Gaudron J.

88. *Telstra Corporation Ltd. v Commonwealth* [2008] HCA 7 at [43] per the court.

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that there can be no acquisition because anything done would not be inconsistent with the right as originally granted.<sup>89</sup>

It is noted that in [\*Commonwealth v WMC Resources Ltd.\*](#),<sup>90</sup> Gummow J explained that:

To accept this proposition is not to assert that the defeasible character of the statutory rights in question denies them the attribute of "property" in the "traditional" sense of the general law.<sup>91</sup>

However, Gummow J went on to state that:

in some circumstances, of which the statutory rights in this case are an instance, the nature of the property may be such that its defeasance or abrogation does not occasion any acquisition in the constitutional sense.<sup>92</sup>

However, more recently, the High Court has warned that:

references to statutory rights as being "inherently susceptible of change" must not be permitted to mask the fact that "[i]t is too broad a proposition ... that the contingency of subsequent legislative modification or extinguishment removes all statutory rights and interests from the scope of s 51(xxxi)". Instead, analysis of the constitutional issues must begin from an understanding of the practical and legal operation of the legislative provisions that are in issue.<sup>93</sup>

No definitive answer may be given regarding the question of whether, and if so, how **proposed section 442D** applies to greenhouse gas titles proposed to be created under the

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89. See, for example, *Attorney-General for the Northern Territory v Chaffey; Santos Limited v Chaffey* [2007] HCA 34 at [30] per the court. See also Brown. S, op. cit., p. 4.

90. [1998] HCA 8. [\*Commonwealth v WMC Resources Ltd.\*](#), although somewhat old, is a particularly relevant case because it involved offshore petroleum title rights under the *Petroleum (Submerged Lands) Act 1967*, the precursor legislation to the Act, and the aim of the Government with the Bill is to establish an offshore greenhouse gas storage regime similar to the existing offshore petroleum regime under that Act. Consequently, the comments of the High Court in that case would be relevant to the question as to the effect of **proposed section 442D**. However, the difficulty in ascertaining any underlying principle from [\*Commonwealth v WMC Resources Ltd.\*](#), is that while the majority of the High Court held that there was no acquisition of property by the extinguishment of WMC Resources' rights under a statutory petroleum exploration permit, each judge gave separate reasons for his or her decision.

91. [1998] HCA 8 at [196].

92. [1998] HCA 8 at [196].

93. *Telstra Corporation Ltd v Commonwealth* [2008] HCA 7 at [49] per the court; *Attorney-General for the Northern Territory v Chaffey; Santos Ltd. v Chaffey* [2007] HCA 34 at [24] per the court.

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Bill. However, it is noted that despite the cautious approach of the High Court in the more recent cases, [\*Commonwealth v WMC Resources Ltd\*](#) has not been overruled.

### Post commencement title protections

A post-commencement petroleum title is defined in item 63, **proposed section 6** as including a post-commencement exploration permit, retention lease and production licence.

**Proposed section 249NDA** generally allows for overlapping of greenhouse gas and petroleum titles.

However, the primary intent to protect post commencement petroleum titles and discoveries is apparent in the following proposed provisions in the Bill.

Under **proposed subsections 249AD(3)** (greenhouse gas assessment permits), **249BB(3)** (greenhouse gas holding leases), and **249CD(3)** (greenhouse gas injection licences), petroleum recovered by a greenhouse gas title holder in the relevant title area would not become the property of that title holder. Instead, such petroleum may only be recovered by the greenhouse gas title holder, with the Minister's written consent, to appraise the petroleum discovery made as an incidence of the particular greenhouse gas operations carried out.

In addition, **proposed section 249NB** provides that if petroleum is discovered in a greenhouse gas title area, the relevant greenhouse gas title holder must immediately inform the Minister about the discovery and, within three days after the date of the discovery, that greenhouse gas titleholder must provide the Minister with a written notice of:

- details of the discovery, and
- any other information as provided for by the regulations.

Failure to comply with the notification requirement would be an offence punishable by a maximum penalty of \$11 000 (100 penalty units).<sup>94</sup>

According to **proposed subsection 249NB(4)**, the notification requirements do not apply to petroleum title holders.

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94. A penalty unit is currently \$110: *Crimes Act 1914* section 4AA. In certain circumstances, additional pecuniary penalties — up to five times the amount of maximum pecuniary penalty imposed on a natural person convicted of the same offence — may be imposed on corporations: see *ibid.*, subsection 4B(3).

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Declared exploration permit, declared retention leases and declared production licences

**Proposed sections 79B, 114B and 138B** provide a process for post-commencement exploration permits, retention leases and production licences to be determined by the Minister as *declared exploration permits, declared retention leases and declared production licences*.

When the Minister makes a determination to declare a title, it indicates that operations under these petroleum titles may have a significant risk of significant adverse impacts on the injection or storage of greenhouse gas substances under existing or future greenhouse gas titles. The determination can be made at the time when the petroleum title is issued or at a later time. The Minister can revoke the determination if the Minister considers that the significant risks of those significant adverse impacts no longer exist.

Under existing sections 79, 114 and 138, exploration permits, retention leases and production licences are granted by the Joint Authority (consisting of the responsible State Minister and the responsible Commonwealth Minister). However, should they subsequently become declared titles, they will be subject to Commonwealth ministerial approval under **proposed sections 79A, 114A and 138A** in order to carry out key petroleum operations.

The Explanatory Memorandum explains that where there are competing interests to be taken account of, these provisions allow the Commonwealth Minister to decide the competing merits of cases where they cannot co-exist.<sup>95</sup> The Regulatory Impact Statement stated:

Allowing the regulator (Commonwealth Minister) to make decisions on which industry should proceed in cases where they cannot co-exist allows the relative merits of the two competing opportunities to be taken into account (the ‘public interest’ model). It also allows for flexibility if the relative importance of petroleum and greenhouse gas operations change. It also enables commercial agreements between the parties to be taken into account, which could lead to acceptable compromise solutions. This could be done through a public interest test in which the regulator would consider the relative merits of the two competing proposals. Criteria could include social, economic and environmental factors.

Stakeholders comment that the process of declaring petroleum titles is unclear as is the way in which *significant adverse impact* is assessed. Some consider that there is no predictable or transparent system to manage the interaction between greenhouse gas title holders and pre-existing and co-existing petroleum title holders and in the opinion of some stakeholders these provisions require significant reconsideration.<sup>96</sup> There is concern with

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95 Regulatory Impact Statement, op. cit., p. 35.

96 See, for example, Australian Coal Association and Minerals Council of Australia, op. cit., p. 21.

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this part of the Bill also that it will result in a disincentive to future upstream oil and gas activity because of a lack of legal certainty,<sup>97</sup> and uncertainty about whether titles might be declared or not.<sup>98</sup>

Note however if an applicant applies to carry on key petroleum operations where an existing greenhouse injection licence is in place, and the Minister considers that the proposed petroleum operations poses a significant risk of significant adverse impact on existing or future greenhouse gas operations, then unless there is an agreement between the greenhouse gas titleholder and the applicant to carry on petroleum operations with which the Minister is satisfied, then the responsible Commonwealth Minister must not give approval (**proposed subsections 79A(10), 114A(10) and 138A(10)**).

The Government states that there is no longer a need to protect existing rights for post commencement titles.<sup>99</sup> However, it is still necessary to avoid perception by the petroleum industry that the proposed greenhouse gas storage system hinders future offshore petroleum operations, which would make it difficult to attract investment in Australia by major petroleum companies.<sup>100</sup>

The need to protect future petroleum title development is reflected by **proposed section 249CZC**, as discussed above.

Some stakeholders expressed concern about the disincentive on development of the greenhouse gas storage industry caused by uncertainty in title is due to what is perceived as the Bill's overarching aim of protecting petroleum interests.<sup>101</sup>

### Issues relating to Pipelines

The provisions of the Bill relating to pipelines enable stakeholders to apply for a licence to construct greenhouse gas substance pipelines within a petroleum production licence area or a greenhouse gas injection licence area, or to construct pipelines from places outside those licensed areas to the licensed areas.

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97 See APPEA, op. cit., p. 26; Chevron, op. cit., p. 6.

98 Woodside, op. cit., p. 9.

99. Regulatory Impact Statement, op. cit., p. 34.

100. *ibid.*

101. See, for example, CO2CRC, op. cit.; WWF Australia, op. cit.; Department of Industry and Resources (WA), op. cit., p. 5; Rio Tinto, op. cit., p. 7; Victorian Government, op. cit., p. 11; Australian Coal Association and Minerals Council of Australia, op. cit., pp. 21-22. See also Chevron, op. cit., p. 3: both post commencement petroleum and greenhouse gas title rights will be uncertain as a result of the proposed amendments in the exposure draft.

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## Approval of a greenhouse gas substance

**Proposed subsection 181(5)** provides that the Joint Authority must first approve the greenhouse gas substance to be transported under a pipeline licence before a pipeline can operate. Licensees must also comply with regulations that establish third party access to services (**proposed subsection 181(8)**).

The Joint Authority must take account of the following factors in relation to applications:

- whether the substance is suitable for injection and permanent storage into an identified greenhouse gas storage formation, and
- for exploratory purposes, if the substance is suitable for injection and storage when searching for a potential greenhouse gas storage formation, (**proposed subsection 181A(3)**).

The Commonwealth Minister may direct the Joint Authority under **proposed subsection 181A(5)** in its exercise of power in approving or refusing an application under **subsection 181A(2)**. Please note that a direction under **proposed subsection 181A(7)**, is not a legislative instrument.

## Rights of Production Licensees and Greenhouse gas injection licensees

**Proposed section 186A** enables a production licensee to apply for a pipeline licence under section 185 (application for pipeline licence) within 90 days of the gazettal of a notice of an application by another person other than the production licensee. The application must be made within the 90 days after gazettal and not more than 180 days (although this can be longer if applied for within 90 days and approved by the Joint Authority). In the application, the production licensee may request that the application of the other person notified in the gazette be rejected. This gives preference to the existing titleholder if they wish to apply for a greenhouse gas pipeline licence. There are no specific provisions in the Bill relating to criteria to refuse the grant of a pipeline licence under proposed section 188A other than if the Joint Authority is not satisfied that there are sufficient grounds to grant a pipeline licence then the Joint Authority must refuse to grant it. Similar rights for greenhouse gas injection licensees exist in **proposed section 186B**.

## Grant of Greenhouse Gas-related Pipeline Licences

**Proposed section 187A** grants greenhouse gas-related licences to those who have applied for a pipeline licence under section 185. Greenhouse gas pipeline licences may be granted to the following:

- a person other than the production licensee (**proposed subsection 187A(2)**)
- a production licensee after compliance with certain requirements(**proposed subsection 187A(3)**)

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- a person in a greenhouse gas injection licence area other than a greenhouse gas injection licensee (**proposed subsection 187A(5)**)
- a greenhouse gas licensee after compliance with certain requirements(**proposed subsection 187A(6)**)
- refusal of a greenhouse gas related pipeline licence to these categories is dealt with in **proposed section 188A** — consultation provisions in **section 226** apply to the refusal of a licence to a production licensee and a greenhouse gas injection licensee who apply for a pipeline licence — consultation involves written notice to the affected person with 30 days notice of the intended decision by the Joint Authority to give the person an opportunity to make a submission to the Authority.

The route of the pipeline should be shown in the plan accompanying the application for a licence. The Joint Authority may suggest a different route if it thinks it appropriate (**proposed subsection 187A(8)**).

### Native Title Rights

Although Native Title rights are protected under the Bill in relation to greenhouse gas activities generally and under section 243 of the *Offshore Petroleum Act 2006* in relation to petroleum activities, pipelines that extend beyond the licensed area into the coastal waters of a State or territory may result in possible conflicts or interference with the ‘enjoyment of native title rights within the meaning of the *Native Title Act 1993*’. The Bill refers to such possible interference in relation to the matter of a site closing certificate (**proposed section 249CZF**), in **proposed section 249NF** where persons carrying out activities under any of the greenhouse gas titles are to do so in a manner that does not interfere with that enjoyment to a greater extent than is reasonably necessary, and in **proposed section 316-311A** relating to site closing directions to holders of greenhouse gas injection licences to take action to eliminate or manage the risk that an injected greenhouse gas substance will have significant adverse impacts on the enjoyment of native title rights. The Attorney-General’s Department advises that the Native Title Act will ensure that grants of greenhouse gas titles are valid and that native title claimants and holders will have the same procedural rights as holders of non-native title interests. That is those with title interests will be consulted about the grants of rights under the Bill.<sup>102</sup>

### State and Territory Rights

Certain State jurisdictions are concerned about the lack of mechanisms in the Bill to enable State and Territory interests to be considered. Cross-jurisdictional issues may arise concerning the treatment of piped greenhouse gas from onshore sites to offshore

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102. Attorney-General’s Department (Cth), Submission, 26 June 2008.

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greenhouse gas storage facilities.<sup>103</sup> There is some concern that administrative confusion will occur because of the separate regimes for the approval of pipeline licences at State/Territory level and approval of the transportation of a greenhouse gas substance by pipeline which is the responsibility of the Commonwealth. The States want a more cooperative effort in dealing with the interactions between the State and the Commonwealth jurisdictions.<sup>104</sup> One stakeholder comments that the pipeline right of way over State and Territory coastal waters is one matter not dealt with by the legislation. A problem that needs addressing, according to the stakeholder, is one illustrated by the Otway Project where one of the difficulties encountered were the approvals necessary for the pipeline which resulted in significant delays and extra expense for the project.<sup>105</sup>

### Third party access

Part IIIA of the *Trade Practices Act 1974* (the TPA) enables third parties to be able to use certain essential infrastructure facilities, where particular public interest criteria are met.

Following the recommendations of the Hilmer Report in 1993 and as part of the commitment to national competition principles, amendments were made to the TPA which came into effect in 1995, establishing ‘a new legal regime under which firms could be given a right of access to ‘essential facilities owned by another firm, when the provision of such a right meets certain public interest criteria.’<sup>106</sup> The Explanatory Memorandum raises a question as to whether the regime contained in Part IIIA applies to a particular identified greenhouse gas storage formation, or infrastructure used for injection and storage operations or related operations.<sup>107</sup> As there appeared to be some doubt as to the applicability of Part IIIA of the TPA to the facilities, it was considered desirable to establish a specialised third party access regime by regulation under the Act.

Compliance with a third party access to services regime may be an attached condition to several categories of licence in the Act;

- revised section 167 – conditions of infrastructure licences are amended to provide for regulations that may establish a third party access regime to services related to infrastructure facilities in connection with greenhouse gas activities

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103 Department of Industry and Resources (WA), op. cit., p. 2; Victorian Government, op. cit., p. 9.

104 See, for example, Department of Industry and Resources (WA), op. cit., p. 4; Australian Coal Association and Minerals Council of Australia, op. cit., pp. 40, 47.

105 CO2CRC, op. cit., p. 7.

106 *ibid.*, p. 242.

107 Explanatory Memorandum, op. cit., p. 41.

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- revised section 181 – conditions of pipeline licences are amended to provide for regulations that may establish a third party access regime for services related to greenhouse gas pipelines
- **proposed section 249CE** – conditions of greenhouse gas injection licences provide for regulations that may establish a third party access regime to services that relate to the following:
  - identified gas storage formations
  - wells, equipment or structures used in injecting greenhouse gas activities, or
  - equipment and structures used in processing, compressing or storing greenhouse gas substances prior to injection.

Several problems/issues are raised by stakeholders concerning third party access. The primary issue is that the detail as to the setting up of the regimes is left to regulations rather than the principal Act itself.<sup>108</sup> Another concern is that third party access regimes will only apply to greenhouse gas facilities and services, something that currently does not apply to the petroleum industry's facilities and services.<sup>109</sup> The Australian Coal Association and the Minerals Council of Australia consider that third party access to identified storage formations will pose liability issues and for that reason greenhouse gas storage formations should be removed from the list of facilities and services to which third party access may apply.<sup>110</sup> APPEA considers that the full extent of these powers are unclear with the detail to be included in regulations and therefore unknown. Initially, it had understood that the third party regimes would only apply to pipelines.<sup>111</sup> The Bill however, includes provisions to set up third party access regimes in relation to all aspects of greenhouse gas injection and storage activities as set out above.

### Access to data

Greenhouse gas industry stakeholders have commented on about their lack of access to data held by existing petroleum title holders that may relate to areas where greenhouse gas injection and storage activities could take place.<sup>112</sup> Factors causing concern include:

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108 See Australian Coal Association and Minerals Council of Australia, op. cit., p. 38; APPEA, op. cit., p. 5.

109 See Australian Coal Association and Minerals Council of Australia, op. cit., p. 38; APPEA, op. cit.

110 *ibid*, p. 38.

111 APPEA, op. cit., p. 5.

112. See Standing Committee on Primary Industries and Resources, op. cit., p. viii (the Committee noted evidence given during the inquiry that:

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- there is an imbalance of information available to greenhouse gas title holders and petroleum title holders in relation to proving whether there is a significant risk of significant adverse impact, usually to overlapping petroleum titles,<sup>113</sup> which could be a significant hurdle to the development of offshore storage<sup>114</sup>
- the availability of data needed for the preparation of site plans<sup>115</sup> — a site plan must demonstrate the safe and secure nature of the storage to the Minister and identify risks and ways in which those risks would be reduced to their lowest practicable level — the regulator then has to make a decision based on this information<sup>116</sup>
- access to data is considered to be a major obstacle to the creation of a ‘level playing field’ in relation to work bids in acreage release<sup>117</sup>
- petroleum title holders have a competitive advantage to enter the greenhouse injection and storage market, while creating a significant barrier for new greenhouse gas competitors — stakeholders recommend that the Minister should be required to take the relative information advantage into consideration when evaluating bids<sup>118</sup>

#### Proposed section 249CZC

**Proposed section 249CZC** is an example of where unequal access to data could create an uneven ‘playing field’ in relation to entering the new greenhouse gas storage industry.

It may be argued that there will be occasions where the onus for refuting questions of:

- commercial viability of any petroleum discovered in an area over which there is a greenhouse gas injection licence and which is subject to a pre-commencement petroleum title

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‘Petroleum companies currently hold most of the technical knowledge and expertise required to explore for and develop potential GHG storage sites.’

See also *ibid.*, pp. 31-32 (Committee’s opinion regarding disparity of access to information).

113 Australian Coal Association and Minerals Council of Australia, *op. cit.*, p. 18; CO2CRC, *op. cit.*, p. 3.

114 CO2CRC, *op. cit.*, p. 4.

115 Australian Coal Association and Minerals Council of Australia, *op. cit.*, p. 18.

116 *ibid.*, p18; Schlumberger, *op. cit.*, p. 4; Rio Tinto, *op. cit.*; CO2CRC, *op. cit.*, p. 3.

117 Australian Coal Association and Minerals Council of Australia, *op. cit.*, p. 19.

118 *ibid.*, p. 27.

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- whether there is significant risk of serious adverse impact test on petroleum recovery operations or the commercial viability thereof, and
- whether it is practicable to eliminate such risk,

would lie on the relevant greenhouse gas injection licensee.<sup>119</sup>

This raises the question of whether the greenhouse gas injection licensee can get access to what would be confidential in-house data relating to the petroleum operations in the area possessed by the petroleum title holder of that area.

**Proposed section 249CZC** does not clearly address this particular question.

This was the subject of concern expressed by some stakeholders.<sup>120</sup>

### Acreage releases

The procedure for releasing acreage is contained in **proposed sections 249AJ and 249AP**. Both procedures relate to the work-bid greenhouse gas assessment permit and the cash-bid greenhouse gas assessment permit.

**Proposed section 249AJ** provides that the Minister can invite applications for the grant of a greenhouse gas assessment permit over any or all of the blocks specified in the gazettal notice. Where there are two or more applicants, the Minister ranks them by means of criteria that will be made publicly available (**proposed subsection 249AL(3)**).

A similar provision exists for cash-bid greenhouse gas assessment permits (**proposed section 249AP**).

Stakeholders have several comments in relation to the procedures for acreage release. Some consider that the criteria for the work-bid process are inadequate, allocating tenure to acreage to the ‘most deserving’ applicant. Such criteria, they claim, are highly subjective and involve different considerations to those involved in the grant of petroleum rights. The Victorian Government noted that the petroleum operators of the Gippsland Basin with their accumulated knowledge and longstanding presence in the area and that this is likely to be the ‘most deserving’ of the grant. New greenhouse gas storage proponents to the area will be unable to make a competitive acreage bid.<sup>121</sup> Others consider that there is a distinct absence of public participation, transparency and accountability throughout the entire greenhouse gas storage process. The Bill only

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119. See, for example, situations arising under **proposed paragraphs 249CZC(1)(c), (d), (f) and 249CZC(3)(c), (d), (f)**.

120. See CO2CRC, op. cit., pp. 3-4; Rio Tinto, op. cit., p. 9; Schlumberger, op. cit., p. 3; Australian Coal Association and Minerals Council of Australia, op. cit., pp. 18-19.

121 See Victorian Government, op. cit., p. 7.

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provides the minimal mandatory matters that the Minister need take account of when granting rights, citing as an example the greenhouse gas acreage releases.<sup>122</sup> Stakeholders have argued that greater transparency is required in the process, and that there should be publicly available guidelines or procedures prescribed by regulation and that the same transparent and accountable procedures should also relate to the petroleum acreage release system.<sup>123</sup> As previously mentioned, some stakeholders have argued that the availability of data is seen as a major obstacle to a ‘level playing field’ being created because petroleum title holders will have a significant advantage as far as availability of data is concerned and this very fact runs counter to general competition principles and creates a significant barrier to entry into the greenhouse gas injection and storage market.<sup>124</sup>

### Significant risk of significant adverse impact test

The Significant Risk of Significant Adverse Impact test (SROSAI test) is referred to in several proposed provisions in the Bill, for example:

- **subsection 146(4B)** (impact of post commencement petroleum production licence on greenhouse gas titles)
- **sections 249AF** and **249BD** (approval by Minister of key greenhouse gas operations)
- **sections 249BZ** (directions the Minister may give to greenhouse gas title holders)
- **section 249CXA** (directions Minister may give to greenhouse gas injection licensees to protect geological formations containing petroleum pools)
- **section 249CZ** (serious situations)
- **section 249CZC** (protecting petroleum discovered in the title area of a pre-commencement petroleum title), and
- **section 249CZF** (site closure and pre-certificate notices).

Issues have been raised with the definition of the SROSAI test.<sup>125</sup>

**Item 81** of the Bill proposes that the meaning of ‘significant risk’ is affected by **proposed section 15E** (see **item 109** of the Bill), which appears to be a mistake and should actually

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122 See ANEDO, op. cit., p. 13.

123 See Australian Coal Association and Minerals Council of Australia, op. cit., p. 27.

124 *ibid.*

125. See BP, op. cit., p. 2; Monash Energy, op. cit., pp. 5, 21-22, 24; Chevron, op. cit., p. 5; Anglo Coal, op. cit., pp. 5-6; esaa, op. cit., p. 3; Rio Tinto, op. cit., pp. 8-9; Victorian Government, op. cit., p. 4; Australian Coal Association and Minerals Council of Australia, op. cit., pp. 15-18.

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be **section 15F**, providing that where there is a risk that a particular operation will have a large adverse impact on other operations, such risk will be considered as being significant even if the probability of it occurring is low.

The actual SROSAI test is not defined elsewhere in the Bill nor in the Petroleum Act, leaving its meaning unclear.<sup>126</sup>

However, it is noted that in other similar cases, the Government has to provide non-legally binding guidance of the meaning of significance in the form of administrative guidelines.<sup>127</sup> It may be possible for the Government to do the same in this context.

### Public interest considerations

Under the proposed amendments in the Bill, instances when the Minister must consider public interest include decisions about:

- approving key petroleum operations in relation to declared exploration permits (**proposed subsection 79A(7)**); retention leases; (**proposed subsection 114A(7)**); production licences (**proposed subsection 114A(7)**)
- approving key greenhouse gas operations relating to greenhouse gas assessment permits (**proposed subsection 249AF(8)**); greenhouse gas holding leases (**proposed subsection 249BD(8)**), and
- grants of greenhouse gas injection licences (**proposed subsection 249CI(3)**).

Under the proposed amendments in the Bill, instances when the Joint Authority must consider public interest include decisions about grants of production licences (**proposed subsections 145(1)(d)** and **146(4B)(c)**).

However, it is noted that under **proposed section 442C** of the Bill, the public interest test may, in fact, be applied to every ministerial decision made under the Bill.

The Government has stated that the public interest test, among other things, will be covered in the Regulations because:

... it appeared inappropriate to pursue this level of detail without first soliciting clearer feedback from stakeholders on the proposed legislative amendments.<sup>128</sup>

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126. For comments of the Standing Committee on Primary Industries and Resources and evidence received from stakeholders during the inquiry regarding this test, see Standing Committee on Primary Industries and Resources, *op. cit.*, pp. 48-51.

127. See, for example, The Department of the Environment and Heritage, 'Matters of National Environmental Significance', *EPBC Act Policy Statement 1.1: Significant Impact Guidelines*, at <http://www.environment.gov.au/epbc/publications/pubs/nes-guidelines.pdf>, accessed on 11 September 2008.

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Stakeholders generally point out that without the detail of what the public interest test involves, they are unable to make informed comments about relevant provisions in the Bill.<sup>129</sup>

Some indication of what the public interest test would involve is given in the Government's Regulatory Impact Statement on the Bill:

Allowing the regulator to make decisions on which industry should proceed in cases where they cannot co-exist allows the relative merits of the two competing opportunities to be taken into account (the 'public interest' model). It also allows for flexibility if the relative importance of petroleum and greenhouse gas operations change. It also enables commercial agreements between the parties to be taken into account, which could lead to acceptable compromise solutions. This could be done through a public interest test in which the regulator would consider the relative merits of the two competing proposals. Criteria could include social, economic and environmental factors.<sup>130</sup>

### Consultative processes

There are several proposed provisions in the Bill relating to consultations that must or may be carried out in relation to ministerial decisions and/or actions under the Bill. Examples are the Minister:

- proposing to direct a greenhouse gas injection licensee under:
  - **proposed section 249CZAA** of the Bill, to take certain action outside the licence area in an attempt to deal with a serious situation pursuant to **proposed section 249CZA** of the Bill
  - **proposed section 249CZCA** of the Bill, to take certain action outside the licence area in an attempt to eliminate, mitigate, manage or remediate a risk that greenhouse gas injection operations could have a significant adverse impact on recovery of petroleum or the commercial viability thereof pursuant to **proposed section 249CZC** of the Bill, and

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128. Regulatory Impact Statement, op. cit., p. 3.

129. See, for example, APPEA, op. cit., p. 27; Monash Energy, op. cit., p. 7; Victorian Government, op. cit., p. 6; Association and Minerals Council of Australia, op. cit., pp. 19-21. For further information regarding stakeholders' comments made during the Exposure Draft inquiry, see Standing Committee on Primary Industries and Resources, op. cit., pp. 52-55.

130. Regulatory Impact Statement, op. cit., p. 35. For further information about the Government's position regarding the use of the public interest test, see Standing Committee on Primary Industries and Resources, op. cit., pp. 51-52.

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- **proposed section 316-311B** of the Bill, to take certain action outside the licence area in relation to site closure pursuant to **proposed section 316-311A** of the Bill
- granting or varying a greenhouse gas special authority under **proposed sections 249HG** and **249 HJ** respectively of the Bill
- making adverse decisions under the Act pursuant to **proposed section 249JH** of the Bill
- cancelling a greenhouse gas title pursuant to **proposed sections 249MB** and **249MC** of the Bill, and
- making entries into the Register to maintain the Register’s accuracy and currency pursuant to **proposed section 298-286** of the Bill.

However, on closer examination of some of those provisions, it appears that consultation generally involves the Minister giving written notice to the relevant registered greenhouse gas titleholders of the Minister’s intention to give the direction; grant or vary a greenhouse gas authority; make an adverse decision; cancel a greenhouse gas title; or correct the Register. The notice must include details of the Minister’s intention, as well as an invitation to make submissions regarding such intention. The Minister must take into account any submission received (see, for example, proposed subsection 249HJ(4)).

In addition, in certain cases, the Minister must also give a copy of such notice to any other person as determined by the Minister,<sup>131</sup> which leaves the following questions unanswered:

- on what basis would the Minister decide who should receive the notice?
- how would the Minister inform him or herself of what he or she should consider when making this decision?
- what avenues of review would be afforded to people who do not agree with that decision?

The Bill also proposes a further limitation — if the Minister considers that the situation is one of an emergency, the Minister would not have to undertake the consultation provided for in the Bill.<sup>132</sup>

Stakeholders have commented on the perceived failure of proposed provisions in the Bill to ensure proper public consultation of the greenhouse gas storage processes provided for in the proposed amendments.<sup>133</sup>

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131. See, for example, **proposed section 249JH** of the Bill.

132. See, for example, **proposed subsections 249CZAA(5)** and **249CZCA(5)** of the Bill.

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## State and Territory Interests

Existing Part 1.4 of the Act provides for the application of the general body of State and Territory laws, as laws of the Commonwealth, to petroleum exploration, exploitation and conveyance activities in the offshore area of that State or Territory.<sup>134</sup>

State and Territory interests in relation to pipelines are discussed on p. 33.

There are also amendments proposed in **items 253-261** of the Bill, regarding the National Offshore Petroleum Safety Authority (the Safety Authority). These amendments essentially include greenhouse gas storage operations within the scope of the Safety Authority's functions and powers relating to its regulation and supervision of occupational health and safety (OH&S) obligations. These proposed amendments allow for communication with relevant State and Territory Greenhouse Gas Storage Ministers about certain matters relating to OH&S obligations.

Some stakeholders have commented on the lack of provision in the Bill for consideration of State interests. It is submitted that this is particularly so because cross jurisdictional issues arise from:<sup>135</sup>

- sources of greenhouse gas, such as power stations and refineries that generate the greenhouse gases, located within State and Territory jurisdictions
- transportation of greenhouses gas from those locations, possibly across jurisdictional boundaries, to offshore sites, and
- greenhouse gas storage formations located across jurisdictional boundaries.

The Government's response is:

Close involvement with the States/Territories on major projects can be addressed through existing consultative processes, including the Ministerial Council on Minerals and Petroleum Resources and its sub-committees.<sup>136</sup>

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133. See, for example, APPEA, *op. cit.*, pp. 4, 16, 27-28; Woodside, *op. cit.*, p. 4; ANEDO, *op. cit.*, p. 20. In particular, the Victorian Government submits that its main concern about the Bill's ability to respond to concerns of the carbon capture and storage industry is that the Bill fails to provide for consultation with respect to important decisions: Victorian Government, *op. cit.*, p. 8. See also Standing Committee on Primary Industries and Resources, *op. cit.*, p. 110.

134. See, in particular, *Offshore Petroleum Act 2006* section 57. For the definitions of 'offshore areas' and 'offshore areas of the States and Territories', see *ibid.*, sections 6, 7 respectively.

135. See, in particular, Department of Industry and Resources (WA), *op. cit.*, pp. 2, 4, 7; Australian Coal Association and Minerals Council of Australia, *op. cit.*, pp. 46-47.

136. Regulatory Impact Statement, *op. cit.*, p. 38.

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## Environmental impact

The Bill proposes several provisions aimed at environmental protection and conservation generally. The following are examples.

**Proposed subparagraphs 249CZF(4)(b)(i) and (iii)** provide that the Minister may refuse to give a pre-certificate notice<sup>137</sup> in relation to an identified greenhouse gas storage formation if the Minister is satisfied there would be a significant risk of significant adverse impact on the conservation and exploitation of natural resources and on the environment, among other things.

**Proposed subparagraphs 316-311A(2)(f)(ix) and (xi)** provide that, in relation to site closure, the Minister may direct the greenhouse gas injection licensee to undertake specified activities to eliminate, mitigate, manage or remediate the risk of significant adverse impact on the conservation or exploitation of natural resources; or the environment, among other things.

Notably, both of these powers are discretionary.

Proposed **paragraphs 249NF(2)(b) and (c)** provide that someone carrying on activities in an offshore area under a particular greenhouse gas title, must do so without interfering with fishing or the conservation of the sea and seabed resources, to an extent greater than is necessary for ‘the reasonable exercise of the rights and performance of the duties’ of that person.

However, it has been argued that these proposals do not go far enough in environmental protection and conservation.<sup>138</sup>

It is noted that sections 23-24A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) prohibit actions that could have a significant on the environment in a Commonwealth marine area, unless:

- ministerial approval has been granted, or
- one of the other exceptions in subsections 23(4) or 24A(8) apply.

Presumably, therefore, the relevant environmental assessment and approval provisions of the EPBCA will apply to greenhouse gas operations in Commonwealth waters if it is possible those actions might have a significant environmental affect.

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137. As to pre-certificate notices, see **proposed section 249CZF** of the Bill.

138. See, in particular, ANEDO, *op. cit.*

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## Long term liability

The Government has stated that while there is limited experience with the permanent storage of large amounts of greenhouse gas, greenhouse gas operations are generally analogous, in scale and complexity, with offshore petroleum.<sup>139</sup> In addition, the Government considers that careful site selection and effective monitoring of greenhouse gas storage sites will minimise risks to people and the environment.<sup>140</sup>

In line with the above comments, liability is only addressed by the Bill to the extent of minimising risk by monitoring and regulating greenhouse gas operations. Such provisions include:

- ministerial powers relating to dealing with serious situations (**proposed section 249CZ**)
- obligations of a greenhouse gas permit, lease or licence holder in relation to surrender of the relevant title (**proposed section 249LB**)
- remedial ministerial directions to former and current greenhouse gas permit, lease or licence holders (**proposed sections 316-312 and 316-311**)
- establishment of greenhouse gas inspectors to monitor and inspect greenhouse gas operations (**proposed sections 316-318 and 316-319**)
- discretionary power of the Minister to impose conditions on greenhouse gas titles that the title holder maintain insurance in relation to the greenhouse gas operations, which are the subject of the greenhouse gas title (**proposed subsection 302(2A)**)
- site closure processes, which include:
  - greenhouse gas injection licensees' obligations to provide certain information with an application for a site closing certificate (**proposed section 249CZE**)
  - issue of a pre-certificate notice to an applicant for a site closing certificate (the applicant) once greenhouse gas injection operations have ceased (**proposed section 249CZF**)
  - payment of security by the applicant to the Government in relation to the estimated costs of programs that the Government proposes to carry out to monitor the behaviour of the greenhouse gas substance stored, as specified in the pre-certificate notice (**proposed sections 249CZGAA and 249CZM**), and
  - site closing ministerial directions to greenhouse gas injection licensees once greenhouse gas injection operations have ceased (**proposed section 316-311A**).

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139. Regulatory Impact Statement, op. cit., p. 3.

140. *ibid.*, p. 18. For further discussion about the risks of CCS, see Appendix 1 pp. 67-69.

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There is no provision in the Bill expressly transferring liability to the Commonwealth Government once a greenhouse gas site is closed. In fact, the Government states that:

there be no new regulation and the issue of long term liability be left to common law in the same way as it does for petroleum and other industries.<sup>141</sup>

According to the Government:

No new regulation would involve relying on common law for long term liability. Under this option, greenhouse gas title holders would not be immunised from common law liability to persons who suffer injury or loss as a result of their actions. Nor would their liability be limited. This non-intervention would extend to all forms of common law liability, including long term liability. The Government would therefore not ‘take over’ long term liability from project participants. Nor would the Government provide any indemnity to project participants in respect of any liability they might incur.

In the long term, the risk would, in a sense, pass to the community because project participants may cease to exist or because of some other time related factor such as availability of witnesses. For example if GHG operations were to result in personal injury or loss to individuals, at a time when there were no project participants still available to be sued, or where damages were for some other reason irrecoverable, the cost would in practice be borne by the community. This would, however, be the consequence of the passage of time, not of any assumption of liability on the part of government. Greenhouse gas industry participants would therefore need to make their own arrangements to deal with potential common law liability, as an ordinary cost of doing business, as must members of any other industry.<sup>142</sup>

The concern with the approach taken in the Bill regarding liability associated with greenhouse gas storage is that the need for monitoring and management of the greenhouse gas site over a much longer period of time than for petroleum recovery activities.<sup>143</sup>

The Government’s statements acknowledge that long term liabilities raise the following issues:

- non-existence of those responsible for the damage at the time when an event occurs giving rise to the liability, and

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141. Regulatory Impact Statement, op. cit., p. 31.

142. *ibid.*, p. 29. For additional Government statements regarding long term liability, see Standing Committee on Primary Industries and Resources, op. cit., p. 75.

143. Minter Ellison, op. cit., p. 20. It is suggested that this could amount to approximately thousands of years: Standing Committee on Science and Innovation, op. cit., p. 95. See also Appendix 1, note 232.

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- difficulties of maintaining proceedings after a long period of time has passed such as unavailability of witnesses.

However, it does not reflect recognition of the difficulties, for example, of obtaining insurance for cover of future risks of unknown scale and magnitude.

The Government's position on long term liability relating to CCS does not reflect the following recommendations of the Science and Innovation Committee:

The Committee recommends that the Australian Government, following industry consultation, develop legislation to define the financial liability and ongoing monitoring responsibilities at a geosequestration site.

The Committee recommends that financial liability and site responsibility should consist of three phases:

- Full financial liability and responsibility for site safety and monitoring should rest with industry operators for the injection phase and a subsequent length of time (this time to be determined by the Australian Government subject to specific site risk analysis);
- Following the above specified time, shared financial liability and responsibility for site safety and monitoring should rest equally with industry operators and state, territory and Australian governments in the longer term. The exact length of this shared responsibility and liability risk analysis; and
- Following the determined phase of shared liability and responsibility, full financial liability and responsibility for site safety and monitoring should be transferred to the two spheres of government in perpetuity.<sup>144</sup>

Stakeholders have expressed concerns about the prospect of greenhouse gas titleholders, particularly, greenhouse gas injection licensees, being liable for damage incurred for many years following closure of a greenhouse gas site, which would discourage investment in greenhouse gas storage investments.<sup>145</sup>

However, the Australian Network of Environmental Defender's Offices (ANEDO) submits that the Bill does not provide sufficient mandatory powers to the Minister to

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144. Standing Committee on Science and Innovation, op. cit., p. 100. For comments by the Standing Committee on Primary Industries and Resources, see Standing Committee on Primary Industries and Resources, op. cit., pp. 78-79.

145. See, for example, CO2CRC, op. cit., p. 4; APPEA, op. cit., p. 6; BP, op. cit., p. 1; Monash Energy, op. cit., pp. 5, 29; Chevron, op. cit., p. 4; WWF Australia, op. cit., pp. 5-6; Rio Tinto, op. cit., p. 10; ExxonMobil, op. cit., pp. 14-15; Australian Coal Association and Minerals Council of Australia, op. cit., pp. 39-40. However, compare those comments with ANEDO, op. cit. (concerns expressed about inadequate address of long term liability issues).

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effectively protect against risks to the environment and humans, citing the example of **proposed subsection 249CZF(4)** of the Bill.<sup>146</sup> Under **proposed subsection 249CZF(4)**, the Minister does not have to refuse to give a pre-certificate notice, relating to an application for site closure of a greenhouse gas storage formation, even if the Minister is satisfied that there is a significant risk that the greenhouse gas injected into that site will have a significant adverse impact<sup>147</sup> on the geological integrity of the site, natural resource conservation or exploration, the environment or people. Nor would the Minister have to refuse to give such pre-certificate notice if the Minister was not satisfied that greenhouse gas substance was behaving as predicted pursuant to the site plan for that greenhouse gas storage formation.

## Regulation of greenhouse gas storage regime

### Administrative burden of joint title holders

As it is generally agreed that most depleted or uncommercial petroleum sites are likely to be optimal greenhouse gas storage sites,<sup>148</sup> this could create situations where petroleum titleholders may also be greenhouse gas title holders (joint title holders).

The proposed amendments in the Bill would effectively create two regulators for these joint title holders:

- the Joint Authority<sup>149</sup> (see, for example, **items 131-136, 140-142** of the Bill), and
- the Minister.

The situation would be further complicated in that the Minister, also part of the Joint Authority,<sup>150</sup> has greater power or authority both as a part of and over the Joint Authority.<sup>151</sup>

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146. ANEDO, op. cit., p. 15.

147. As to 'significant risk of significant adverse impact', see above p. 38.

148. See, for example, Standing Committee on Science and Innovation, op. cit., p. 96.

149. As to the meaning of Joint Authority, see *Offshore Petroleum Act 2006* section 38.

150. *ibid.*

151. As to the Minister's powers as part of the Joint Authority, see *ibid.*, section 41 (Decision making). As to the Minister's powers over the Joint Authority, see, for example, directions that the Minister would be able to give the Joint Authority under **proposed sections 177B and 181A** in the Bill.

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### Regulation by the Joint Authority

Such potential administrative burdens for joint title holders are particularly noticeable in relation to the transport of greenhouse gas from its source to the greenhouse gas storage site by pipelines.

The Joint Authority has the power under section 181 to grant pipeline licences subject to any conditions it thinks appropriate. In relation to a greenhouse gas pipeline, the Joint Authority has to approve the greenhouse gas substance under **proposed section 181A**. The Minister, however, under **proposed subsection 181A(5)** can direct the Joint Authority in its exercise of power of approving or refusing approval of a greenhouse gas substance to be conveyed by the pipeline. In addition, the Minister may generally direct the Joint Authority in the exercise of its power conferred by Part 2.6 of the Act (Pipeline Licences) if it relates to an application for an infrastructure licence or is an infrastructure licence relating to infrastructure associated with greenhouse gas activities as set out in **proposed subsection 13(3)**. These directions under **proposed subsections 177B(1) and 181A(5)** are not legislative instruments, which means they are not tabled in the Parliament nor are they subject to parliamentary scrutiny.

### Regulation by Commonwealth Minister

Greenhouse gas title holders would have various regulatory obligations imposed on them, in relation to greenhouse gas operations, by proposed amendments in the Bill. These include:

- applications for:
  - various greenhouse gas titles (**proposed sections 249AE, 249BC and 249CE**) and authorities (**proposed sections 249GF and 249HE**)
  - consent to surrender a greenhouse gas title (**proposed section 249LA**)
  - a site closing certificate (**proposed section 249CZE**)
  - approval of transfer of a greenhouse gas title (**proposed section 298-257**)
  - entering name on Register as greenhouse gas title holder (**proposed section 298-265**)
  - approval of current and future dealings<sup>152</sup> (**proposed sections 298-271 and 298-280** respectively), and
- data management (see **Chapter 5** of the Act and **proposed Chapter 5A** of the Bill)

Greenhouse gas special authority holders would also have particular reporting obligations under **proposed section 249HK** in the Bill. If, during a particular month a greenhouse gas

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152. As to the effects of ‘dealings’, see **proposed section 298-269** of the Bill.

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special authority<sup>153</sup> is in force over any part of a block, which is also subject of a greenhouse gas permit, lease or licence, the holder of the greenhouse gas special authority must, within 30 days following the end of that month, report to the registered greenhouse gas permit, lease or licence holder about operations carried out on the block during the month.

In addition, greenhouse gas permit, lease and licence holders must notify the Minister about possible eligible greenhouse gas storage formations and any discovery of petroleum under **proposed sections 249NA** and **249NB** of the Bill respectively.

Some stakeholders have commented on the potential for additional administrative burdens being placed on joint title holders by proposed amendments in the Bill.<sup>154</sup>

### Expansive use of ministerial discretion

The Minister has various discretionary powers under proposed amendments in the Bill. Examples of these powers are:

- by written or published notice, make certain directions (numerous proposed provisions)
- request information (**proposed section 298-288**)
- make decisions about blocks (**proposed subsections 249NE(1)** and **249NH(3)**)
- cancel titles (see, for example, **proposed sections 249MB** (greenhouse gas permits, leases and licences), **249ME** (greenhouse gas search authority))
- consent or refuse to consent to surrender of a greenhouse gas title (**proposed section 249LB**)
- vary, suspend or exempt titleholders from conditions imposed on greenhouse gas permits; leases; licences; search or special authorities (**proposed sections 249KA** and **249KE**), and
- grant, refuse to grant, vary or revoke greenhouse gas titles and authorities (see, for example, **proposed sections 249HC**, **249HF**, **249HI** and **249HL** (greenhouse gas special authorities)).

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153. As to ‘greenhouse gas special authorities’, see **proposed sections 249HB-249HD** of the Bill.

154. See Woodside, op. cit., p. 8; Monash Energy, op. cit., p 11; Department of Industry and Resources (WA), op. cit., pp. 2, 4; Santos Ltd., op. cit., p. 2. For further extracts of stakeholder comments, see Standing Committee on Primary Industries and Resources, op. cit., pp. 15-17. For comments of the Standing Committee on Primary Industries and Resources, see *ibid.*, p. 20.

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This is an extensive, but by no means exhaustive, list of discretionary powers that would be given to the Minister. In addition, the Bill does not always clarify those factors that the Minister must consider when using his or her discretion. Both factors are of concern to stakeholders largely because of the uncertainty created by such discretionary decision making and the ensuing disincentive to invest in greenhouse gas storage operations.<sup>155</sup>

The lack of clarity of the term ‘public interest’, as discussed above, is related to this issue.

#### Use of expert advice

The Bill does not expressly mandate the use of expert advice by the Minister when making decisions regarding matters such as impact assessment tests.

In addition, the Explanatory Memorandum does not explain whether, and if so, how the use of expert advice would be used.

Stakeholders have expressed concerns about this issue.<sup>156</sup>

As previously mentioned, it is noted that the lack of express provision for the use of experts in the Bill is not necessarily unusual and that the Government, in such circumstances, does refer to experts in the relevant area. However, given that greenhouse gas storage is a new and emerging industry and that industry stakeholders have clearly expressed their interest in, and concern for, reliable and appropriate expert advice being relied upon in developing this new industry, the Government may consider explaining its position regarding the use of expert advice. Such explanation would have been usefully incorporated into the Explanatory Memorandum to the Bill.

#### Transparency of decision making

Stakeholders have also commented that ministerial decision making proposed by the Bill would not be sufficiently transparent, thereby not encouraging accountability.<sup>157</sup>

#### Notification requirements

The Bill does propose some degree of notification requirements, including the requirement to publish:

- variations of notices of directions to greenhouse gas titleholders in relation to:

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155. See APPEA, op. cit., pp. 15-16; Monash Energy, op. cit., pp. 4, 9-10; ExxonMobil, op. cit., p. 10; ANEDO, op. cit., pp. 13-15; Australian Coal Association and Minerals Council of Australia, op. cit., pp. 23-25.

156. See Monash Energy, op. cit., p. 10; essa, op. cit., p. 3; Victorian Government, op. cit., p. 9; ANEDO, op. cit., pp. 13-14.

157. See, for example, Victoria Government, op. cit., p. 10.

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- dealing with serious situations (**proposed subsection 249CZA(12)**)
- protecting petroleum discoveries (**proposed subsection 249CZC(12)**)
- variations of conditions of greenhouse gas injection licences (**proposed subsection 249KA(4)**)
- notices of surrender and cancellation of titles (**proposed subsections 249LC(3)** and **249MB(3)** respectively)
- notices of declarations relating to reservation of blocks and titles (**proposed subsection 249NE(1)**)
- notices of correction of the Register (**proposed subsection 298-286(3)**), and
- notices of directions to remove property (**proposed subsections 316-313(3)** and **(4)**).

Importantly, **proposed section 406-418** of the Bill sets out a list of events, of which the occurrence and details must be published in the *Gazette*.

Reasons provided for ministerial decisions

Under **proposed sections 249JH** and **249MC**, when proposing to make an adverse decision<sup>158</sup> or a decision to cancel a title, the Minister must provide the affected person with a notice of the proposed decision, which sets out the reasons for and invites submissions regarding that proposed decision.

It is noted that the Bill does not otherwise propose that the Minister publish reasons for final decisions that he or she makes. There appears to be slightly more extensive provision for decision makers to provide reasons for decisions made under existing petroleum provisions in the Act.<sup>159</sup>

However, it is noted that:

The *Administrative Decisions (Judicial Review) Act 1977* also confers on an ‘aggrieved person’ a right to obtain written reasons for the decision in question. The person may request a written statement setting out the findings on material questions

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158. As to what is an adverse decision, see **proposed subsection 249JH(1)** of the Bill.

159. See, for example, *Offshore Petroleum Act 2006* Schedule 3 subclauses 77(3) (OHS prohibition notices) and 80(2) (OHS inspection reports); Schedule 5 subclause 9(11) (disclosure of derivative information after five years); and subsections 226(3) (Joint Authority making an adverse decision regarding a petroleum title), 239(2) (Joint Authority’s cancellation of a petroleum title) and 434(5) (Minister’s reconsideration of reviewable delegated decision).

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of fact, referring to the evidence or other material on which those findings were based and giving reasons for the decision.<sup>160</sup>

#### Right of appeal

Part 6.1 of Chapter 6 in the Act provides for reconsideration and review of decisions made under the Act. In particular, under **section 433** of the Act, 'reviewable ministerial decision' includes a decision, which is:

- (i) is made under this Act or the regulations; and
- (ii) is not a decision of a delegate of the responsible Commonwealth Minister; and
- (iii) is made in the performance of the functions, or the exercise of the powers, of the Joint Authority, or the Designated Authority, in relation to the offshore area of an external Territory;

As it is, that part of the existing definition would not include the Minister's decisions made under the Bill.

The definition in **section 433** then provides that 'reviewable ministerial decision' would, in the alternative, would include:

- (i) regulations made for the purposes of paragraph 422(2)(c) or 423(2)(c), where the decision is of a kind referred to in paragraph 428(2)(b); or
- (ii) regulations made for the purposes of paragraph 425(2)(c) or 426(2)(c); or
- (iii) subsection 434(1) or (4); or
- (iv) clause 6, subclause 7(1), clause 8, or subclause 9(6) or (10), of Schedule 5.

Note 1: Subparagraphs (b)(i) and (ii) relate to the release of technical information.

Note 2: Subparagraph (b)(iii) relates to the reconsideration of reviewable delegated decisions.

Note 3: Subparagraph (b)(iv) relates to the release of technical information given to the Designated Authority before 7 March 2000.

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160. Attorney-General's Department, 'General information on the Australian Administrative Law System', [http://www.ag.gov.au/www/agd/rwpattach.nsf/VAP/\(CFD7369FCAE9B8F32F341DBE097801FF\)~98General+information.doc/\\$file/98General+information.doc](http://www.ag.gov.au/www/agd/rwpattach.nsf/VAP/(CFD7369FCAE9B8F32F341DBE097801FF)~98General+information.doc/$file/98General+information.doc), accessed on 29 July 2008.

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It is noted that the only amendment to **section 433** proposed by the Bill is **item 274A**, which proposes to amend the definition of ‘reviewable Ministerial decision’ in **section 433** of the Act to include regulations made regarding confidential use of information or samples under **proposed sections 406-422** and **406-423** of the Bill.

The Bill proposes some other appeal rights in relation to the Minister’s decisions.

**Proposed section 298-298** of the Bill enables the Minister to determine registration fees. **Proposed subsection 298-298(3)** provides that the Minister’s fee determination may be appealed against in the Federal Court or relevant State or Territory Court.

**Proposed section 316-315** of the Bill provides for limitation of action relating to the removal, sale or disposal of property under **proposed section 316-314** of the Bill, with the exception of **proposed subsection 316-314(4)** and **proposed section 442D** of the Bill. In other words, the only actions, suits or proceedings permitted are for recovery of costs and expenses by the Minister incurred in relation to such removal, sale or disposal of property; as well as compensation for the acquisition of property other than on just terms. However, rights conferred on a person by the *Administrative Decisions (Judicial Review) Act 1977*<sup>161</sup> to apply to a court; or any other rights either for judicial review or that a person has to seek review by a court or tribunal, in relation to:

- a decision made
- failure to make a decision, or
- actions taken for the purpose of making a decision,

continue to be enforceable under **proposed subsection 316-315(3)** in relation to such removal, sale or disposal of property.

## Use of regulations

The Bill contains provisions setting out what the regulations may provide, for example:

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161. For meanings of expressions used in **proposed subsection 316-315(3)**, see *Administrative Decisions (Judicial Review) Act 1977* section 10. See also Attorney-General’s Department, ‘General information on the Australian Administrative Law System’, op. cit.:

‘A review may be sought under the *Administrative Decisions (Judicial Review) Act 1977* by a ‘person who is aggrieved’ by the decision, conduct or failure to make a decision. Any person whose ‘interests are or would be adversely affected’ by the decision is a person ‘aggrieved’ by that decision. The grounds on which a review may be sought under the Act are set out in the Act, but generally cover failure to comply with the specific requirements of legislation under which the decision is made, and the general administrative law principles ...’

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- conditions relating to pre-certificate notices and site closure (**proposed paragraph 249CZF(6)(b)**)
- basis of estimates of and other details relating to security amounts relating to pre-certificate notices (**proposed 249CZGAA(5)**)
- rights conferred by greenhouse gas special authorities<sup>162</sup> ((**proposed subsections 249CZJC(3)** and **249HB(3)**) respectively)
- application fees (**proposed subsection 249JB(2)**)
- notification of petroleum discovery in a greenhouse gas title area and information to be provided about the discovery (**proposed subsection 249NB(3)**)
- site plans — details (**proposed section 15E**); Part A will contain predictions on how the GHG will behave in the identified greenhouse gas storage formation and Part B will deal with other matters
- fees for inspection of the Register and instruments (**proposed section 298-296**), and
- exercise of rights and compliance with international law obligations (**proposed sections 447A** and **448A**).

Such regulations are yet to be published.

According to the Government:

It should be stressed that the Government has yet to make any decision on the *regulations* and *guidelines* to cover things such as public interest tests, impact significance tests, assessments and approvals, monitoring and verification, financial issues and post closure responsibility. Aside from acknowledging those used in offshore petroleum as a useful starting point for many of these instruments, it appeared inappropriate to pursue this level of detail without first soliciting clearer feedback from stakeholders on the proposed legislative amendments. As a consequence, many issues relating to the final cost of regulation also cannot be assessed at this stage, and will be the subject of a future analysis.<sup>163</sup>

The final stage in the process will be the development of the associated regulations and guidelines. The development of these regulations and guidelines will require further consultation with relevant stakeholders. A further RIS will be undertaken on the regulations and guidelines, at which stage a clearer picture of costs and benefits will be provided.<sup>164</sup>

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162. As to greenhouse gas special authorities, see **proposed section 249HE** of the Bill.

163. Regulatory Impact Statement, op. cit., p. 3.

164. *ibid.*, p. 43.

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Stakeholders' comments reflect the importance of such regulations being developed and published in order to complete consultation on the Bill. Without knowledge of the content of those regulations, some stakeholders generally believe that consultation on the Bill is inadequate.<sup>165</sup>

It is noted that the Scrutiny of Bills Committee made the following comment on the setting of fees in unpublished regulations (albeit in another, though related, the Offshore Petroleum (Annual Fees) Amendment (Greenhouse Gas Storage) Bill 2008:

The Committee has consistently drawn attention to legislation which provides for the rate of a fee to be set by regulation. This creates a risk that the fee may, in fact, become a tax. It is for Parliament, rather than the makers of subordinate legislation, to set a rate of tax.<sup>166</sup>

## Other legal issues

### Offences

#### Use of strict liability offences

Several proposed provisions in the Bill provide for strict liability offences.<sup>167</sup>

Strict liability offences do not require fault to be proven and the requirement to prove fault has been a basic and important protection of criminal law. The concern about using strict liability offences stems from the general premise that it is unfair to subject people to:

criminal punishment for unintended actions or unforeseen consequences unless these resulted from an unjustified risk (ie recklessness).<sup>168</sup>

The Government has further stated that:

Commonwealth Governments and Parliaments have long taken the view that any use of strict or absolute liability should be properly justified.<sup>169</sup>

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165. See APPEA, op. cit., p. 27; Woodside, op. cit., pp. 2, 4; WWF Australia, op. cit., pp. 3, 9.

166. Senate Standing Committee on the Scrutiny of Bills, *Alert Digest*, op. cit., p. 32. See also a similar comment relating to the Offshore Petroleum (Registration Fees) Amendment (Greenhouse Gas Storage) Bill 2008: Senate Standing Committee on the Scrutiny of Bills, *Alert Digest*, op. cit., p. 34.

167. These have been listed by the Scrutiny of Bills Committee and will not be repeated in this Digest. See Senate Standing Committee on the Scrutiny of Bills, *Alert Digest*, op. cit., pp. 25-29.

168. Attorney-General's Department, [A Guide To Framing Commonwealth Offences, Civil Penalties and Enforcement Powers](#), uncleared draft, Canberra, December 2007, pp. 24, 26-27.

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Please refer to the comments made by the Scrutiny of Bills Committee relating to the use of strict liability offences in the Bill.<sup>170</sup>

Information gathering and self-incrimination

**Proposed subsection 406-412(1)** provides that a person is *not* excused from providing information, evidence or documents under **proposed section 406-409** on the grounds of self-incrimination or that it would expose the person to a penalty.

However, **proposed subsection 406-412(2)** provides that the information, evidence or documents, *or anything obtained as a direct or indirect consequence* of giving the information, evidence or documents cannot be used in evidence against the person in *civil* or *criminal* proceedings other than criminal proceedings for an offence for failure to provide information, documents or evidence; or the provision of false or misleading information, documents or evidence.

Access, entry and inspection provisions

**Proposed section 316-319** of the Bill provides that a greenhouse gas project inspector<sup>171</sup> may exercise access, inspection and entry powers in relation to structures, vessels, aircraft and buildings used in connection with certain greenhouse gas operations. The greenhouse gas project inspector may inspect and test equipment, as well as inspect, take extracts from and make copies of documents, used in connection with greenhouse gas operations.

Entry

Importantly, under **proposed subsection 316-319(3)**, a greenhouse gas project inspector may only enter residential premises with either the occupier's voluntary consent or a warrant issued by a magistrate. However, there are concerns with the relevant provisions.

First, it is noted that **proposed subsection 316-319(5)** provides that before obtaining the occupier's consent, the occupier must be informed that he or she may refuse such consent and that **proposed subsection 316-319(6)** provides that consent must be voluntary in order to be valid. Yet, there is no provision in the Bill requiring the greenhouse gas project inspector to provide the occupier of premises with the information necessary to enable that

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169. *ibid.*, p. 25.

170. Senate Standing Committee on the Scrutiny of Bills, *Alert Digest*, *op. cit.*, pp. 25-29. It is noted that the Government has provided its response to the Committee on 1 August 2008: Senate Standing Committee on the Scrutiny of Bills, *Alert Digest*, Canberra, no. 7, 27 August 2008.

171. As to the appointment of greenhouse gas project inspectors, see **proposed section 316-318** of the Bill.

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person to give informed consent, such as explicit information about the possible ramifications of consenting.

Second, where the greenhouse gas project inspector relies on a warrant, the only requirement is for the greenhouse gas project inspector to provide the occupier of the premises a copy of the warrant or a form thereof — if the occupier is at the premises (**proposed subsection 316-319(4)**). There is no requirement for the greenhouse gas project inspector to inform the occupier, in plain English, of the occupier's rights and responsibilities.<sup>172</sup> Yet the Government has stated that such a requirement is in fact policy.<sup>173</sup>

Third, it is also noted that **proposed subsection 316-319(7)** requires that a person who is either the occupier of any building, structure or place; or someone in charge of a vessel, aircraft or equipment, referred to in **proposed subsection 316-319(2)**, must provide reasonable assistance to the greenhouse gas project inspector.

It is unclear, given the wording of **proposed subsection 316-319(2)** and structure of **proposed section 316-319** in general, whether the places in **proposed subsection 316-319(2)** may include 'residential premises', as well as 'non residential premises'. If so, it is noted that:

- **proposed subsection 316-319(7)** does not distinguish between entry by consent and entry by warrant, and
- **proposed subsection 316-319(8)** generally provides that non-compliance with the requirement in **proposed subsection 316-319(7)** is an offence.

In relation to residential premises, this would be in stark contrast to the Government's position that:

Where legislation provides for entry to premises with consent, there should not be a requirement to cooperate with the officer / inspector and failure to cooperate should not be an offence

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172. For comments regarding such a requirement, see Attorney-General's Department, [A Guide To Framing Commonwealth Offences, Civil Penalties and Enforcement Powers](#), uncleared draft, Canberra, December 2007, p. 85; Senate Standing Committee on the Scrutiny of Bills, [Entry, Search and Seizure Provisions in Commonwealth Legislation: 12<sup>th</sup> Report of 2006](#), Canberra, 4 December 2006, pp. 294, 297.

173. See Attorney-General's Department, [Government Response to the Senate Standing Committee for the Scrutiny of Bills: 12<sup>th</sup> Report – Entry, Search and Seizure Provisions in Commonwealth Legislation](#), January 2008, p. 5.

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Requiring cooperation or penalising non-cooperation is fundamentally inconsistent with the notion of consent.<sup>174</sup>

It is also noted that there is no provision for a greenhouse gas project inspector to rely on a warrant or the occupier's consent to exercise his or her powers of access, entry and inspection with respect to non-residential premises. Under **proposed subsection 316-319(1)**, the greenhouse gas project inspector simply has to exercise those rights at a reasonable time and to produce his or her identity card.

It would be of assistance for the Government to clarify whether **proposed subsection 316-319(2)** refers to both residential and non residential premises.

Inspection

Under **proposed paragraph 316-319(2)(c)** of the Bill, a greenhouse gas project inspector may inspect and test equipment, which the greenhouse gas project inspector reasonably believes is being or will be used in connection with certain greenhouse gas operations in an offshore area.

Under **proposed paragraph 316-319(2)(d)** of the Bill, a greenhouse gas project inspector may also enter a structure, aircraft, vessel, building or place, either offshore or in a State or Territory, where the greenhouse gas project inspector reasonably believes there are documents connected with those greenhouse gas operations, to inspect, take extracts from or make copies of those documents.

It is proposed that failure by the occupier of the premises to assist the greenhouse gas project inspector or hindering the greenhouse gas project inspector in exercising those powers would be offences (**proposed subsections 316-319(8) and (9)**).

The question raised by these proposed provisions is that: do such powers of inspection, testing, taking extracts of and copying amount to 'seizure'?

In the Explanatory Memorandum, the Government appears to simply state that:

These powers are consistent with the monitoring powers conferred on mining inspectors,<sup>175</sup>

Such a question is more significant when considering that such powers may be exercised without informed consent or warrant in relation to non-residential premises.

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174. Attorney-General's Department, [\*A Guide To Framing Commonwealth Offences, Civil Penalties and Enforcement Powers\*](#), op. cit., p. 83.

175. Explanatory Memorandum, op. cit., p. 93.

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## Concluding comments

Carbon capture and storage, on a scale as contemplated by the Bill, is an emerging global industry, involving developing scientific knowledge and technologies, and is an important part of a global effort in reducing carbon dioxide emissions.

The Bill provides a preliminary framework within which such an industry could develop in Australian offshore areas, with many of the details of the framework to be included by way of regulations (yet to be published).

Submissions indicate that industry stakeholders, although generally welcoming of the development of a CCS industry, continue to have concerns about certain aspects of the Bill and its operation, primarily relating to certainty of investment for future CCS investors, the disincentives for new entrants to the greenhouse gas storage industry and certain possible anti-competitive effects.

Lastly, in proposing a preliminary framework, concerns about the Bill relate as much to what has been omitted from the Bill, such as failure to expressly or sufficiently provide for:

- responsibility for potential short and long term liability arising from CCS operations, and
- the bases upon which the Minister makes important decisions, especially those affecting people's rights and interests.

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## Appendix 1

### Carbon Capture and Storage technology

#### Australia's energy consumption

Although Australia has only 0.32 per cent of the world's population, Australia contributes 1.43 per cent of global greenhouse gas emissions and has one of the highest *per capita* emission rates in the world. Much of this is due to its heavy reliance on coal-based electricity generation, although other factors — such as the size of the country, the climate, and the large volume of mineral processing — also contribute. The amount of carbon burned per dollar of wealth created in Australia is higher than the USA and nearly double that of Europe and Japan. The average growth rate of Australia's emissions over the last 25 years was twice that for the USA and Japan, and five times that for Europe.<sup>176</sup>

Australia currently consumes over 5600 petajoules (PJ) of primary energy<sup>177</sup> annually, of which renewable energy sources supply less than five per cent.<sup>178</sup> Stationary energy consumption alone produces annual emissions of over 280 megatonnes (Mt) of CO<sub>2</sub>-equivalents,<sup>179</sup> accounting for half of Australia's total emissions.<sup>180</sup> Growth in Australian energy consumption is projected to average around 1.6 per cent until 2030, and it is forecast that Australia will continue to be reliant on fossil fuels to supply most of its energy needs for several decades. Under policy measures in operation during 2007, fossil fuels are projected to account for 94 per cent of primary energy consumption in 2029-30;<sup>181</sup> however, greater reliance on renewable energy sources should result from Government policy measures including a renewable energy target of 20 per cent by 2020

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176. CSIRO, 'CO<sub>2</sub> emissions increasing faster than expected', media release, 22 May 2007.

177. Energy is measured in units called joules. A petajoule is 10<sup>15</sup> or one thousand million million joules.

178. Australian Bureau of Agricultural and Resource Economics, 'Energy in Australia 2008', February 2008, pp. 2, 52.  
[http://www.abare.gov.au/publications\\_html/energy/energy\\_08/energyAUS08.pdf](http://www.abare.gov.au/publications_html/energy/energy_08/energyAUS08.pdf), accessed 6 August 2008.

179. Emissions of non-CO<sub>2</sub> greenhouse gases such as methane and nitrous oxide are converted to CO<sub>2</sub>-equivalents (CO<sub>2</sub>e), or the amount of CO<sub>2</sub> that would have an equivalent impact on global warming after accounting for the relative efficiency of the different molecules in trapping heat within the earth's atmosphere.

180. Department of Climate Change, 'National Greenhouse Gas Inventory 2006', June 2008, <http://www.greenhouse.gov.au/inventory/2006/pubs/inventory2006.pdf>, accessed 6 August 2008.

181. Energy in Australia, op. cit., p. 66.

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and the planned Carbon Pollution Reduction Scheme that will drive investment in and uptake of renewable energy.<sup>182</sup>

In order to reduce its emissions of carbon dioxide, Australia may need to consider 'clean coal' technologies, including carbon capture and storage, of which geosequestration for greenhouse gas storage is a part.

### Clean coal technologies

There are a number of processes that have been used for many years in coal-fired power stations that aim to improve the efficiency and environmental acceptability of coal extraction, preparation and use, and many more are under development. These processes are collectively known as 'clean coal technologies'. These technologies reduce emissions of several pollutants, reduce waste and increase the amount of energy gained from each tonne of coal. They include various chemical and physical treatments applied pre- or post-combustion. They may be broadly divided into processes relating to combustion efficiency or pollution control. An example is 'gasification' of coal, by burning it in oxygen to produce a cleaner gaseous fuel known as 'syngas' (a mixture mainly of hydrogen and carbon monoxide), which is comparable in its combustion efficiency to natural gas. There are also systems that increase efficiency by recycling waste heat, which use less coal to generate the same amount of power.<sup>183</sup>

Most of Australia's current coal-fired electricity-generating plants are of a conventional design, with typical efficiencies of about 33-35 per cent. This means that only about 35 per cent of the usable energy in the coal is actually converted into electricity. Much of the rest is waste heat. Plants with greater energy conversion efficiency (up to about 42 per cent) are possible by using very high temperature steam, which is known as supercritical steam. Such plants are in commercial use in many developed countries and are being installed in greater numbers in developing countries such as China. Even higher efficiencies (up to 50 per cent) are expected from 'ultra-supercritical' plants that utilise additional heat-capturing cycles. Two-thirds of Australia's coal-fired power plants are older than 20 years, and only four employ supercritical technology. Two plants utilising clean coal technology are under construction in Australia, and several more are proposed.<sup>184</sup>

Supercritical plants are now built to an international standard, and a CSIRO project is under way to investigate the production of ultra-clean coal that achieves 50-55 per cent energy conversion efficiency, reduces ash and sulphur to low levels, and can reduce

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182. Department of Climate Change, 'The Australian Government's Renewable Energy Target', <http://www.greenhouse.gov.au/renewabletarget/publications/pubs/fs-ret.pdf>, accessed 6 August 2008.

183. S. Baldwin, *Carbon Capture and Storage*, Briefing Paper no. 2/08, NSW Parliamentary Library Research Service.

184. Telephone conversation with staff at Energy Supply Association of Australia.

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greenhouse gas emissions by 25 per cent compared with the best conventional coal power stations. This works out at about a 10 per cent reduction in total greenhouse gas emission across the whole lifecycle of the plant, (which includes all the additional emissions during mining, production and transport).<sup>185</sup>

Gasifying coal to produce syngas reduces the emissions of sulphur, nitrogen oxides, and mercury, resulting in a much cleaner fuel while reducing the cost of capturing CO<sub>2</sub> emissions from the flue gas where that is conducted. Integrated gasification combined cycle (IGCC) systems combine gasification with a heat recovery system that feeds a steam-powered generator, thereby increasing the power generated from a given amount of coal. Continued development of IGCC systems is expected to further reduce emissions.<sup>186</sup> Along with extensive research into and trials of IGCC in Australia over recent years,<sup>187</sup> a joint venture by CSIRO and Metex Resources Ltd is underway to develop underground coal gasification technology, with a pilot project due to commence in the Surat Basin in Queensland in August 2008.<sup>188</sup> This approach converts coal to syngas underground, which reduces costs of mining and handling; allows exhaust gases to be captured and separated; and may be applied to deep, high ash, conventionally unmineable coal.

At present, none of the clean coal technologies in use or in development offer the prospect of emissions reductions as significant as carbon capture and storage (CCS). Many of these technologies are being developed with CCS in mind, for example concentrating CO<sub>2</sub> in the combustion exhaust to ease the separation and capture of CO<sub>2</sub>. The majority of CCS effort is being invested in incorporating CCS into new power generation plant designs: current figures indicate that it is cheaper to build a new IGCC plant that produces a pure CO<sub>2</sub> exhaust stream than to retrofit an existing plant with post-combustion capture technology.<sup>189</sup>

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185. CSIRO Low Emissions Electricity and Competitive Coal research, [http://www.det.csiro.au/science/lee\\_cc/ultra\\_clean\\_coal.htm#research](http://www.det.csiro.au/science/lee_cc/ultra_clean_coal.htm#research), accessed 15 July 2008.

186. See IPCC, 'Climate Change 2007: Mitigation', Working Group III to the *Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, p. 265.

187. For example, under CSIRO's Energy Transformed Flagship: <http://www.csiro.au/org/EnergyTransformedFlagship.html>, accessed 6 August 2008.

188. Carbon Energy Pty Ltd: see <http://www.carbonenergy.com.au/?page=projects&section=59>, accessed 6 August 2008.

189. Coal21: see <http://www.coal21.com.au/index.php>, accessed 6 August 2008.

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## The science of geosequestration

### Introduction

Geosequestration is the injection and storage of greenhouse gases underground, out of contact with the atmosphere. The best sites are deep geological formations, such as depleted oil and natural gas fields, or deep natural reservoirs filled with saline water (saline aquifers). Geosequestration is part of the three-component scheme of carbon capture and storage (CCS), which involves:

- capture of CO<sub>2</sub> either before or after combustion of the fuel
- transport of the captured CO<sub>2</sub> to the site of storage, and
- injection and storage of the CO<sub>2</sub>.

This scheme is proposed as a means of reducing the greenhouse gas emissions of fossil fuel burning in power generation and CO<sub>2</sub> production from other industrial processes such as cement manufacturing and purification of natural gas. It is predominantly aimed at mitigating emissions of CO<sub>2</sub>, but geosequestration may also prove to be applicable to other greenhouse gases.

In addition to geological formations, other potential reservoirs for CO<sub>2</sub> sequestration under consideration are biological sinks, ocean storage, and conversion to solid mineral carbonates.

- Natural terrestrial *biological sinks* for CO<sub>2</sub> already sequester about one third of CO<sub>2</sub> emissions from fossil fuel combustion.<sup>190</sup> These natural sinks are a transient response to higher atmospheric CO<sub>2</sub> concentration. The uptake of CO<sub>2</sub> by vegetation will decrease with time as plants grow to their full capacity and become limited by other resources such as nutrients, and regrowth potential in previously cleared or sparsely vegetated areas is fulfilled. Biological storage could be enhanced through agricultural and forestry practices, but the capacity is limited and storage may not be permanent.
- The *ocean* has also been an important sink for anthropogenic CO<sub>2</sub> emissions of similar magnitude to the land sink but, as with the land sink, the ocean sink will decrease in strength. CO<sub>2</sub> is quickly dissolved in the ocean by combining with carbonate ions, but the number of these ions is limited and as their concentration decreases this will limit the rate at which CO<sub>2</sub> is taken up by the ocean out of the

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190. See IPCC, 'Climate Change 2007: The Physical Science Basis', Working Group I to the *Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, Table 7.1, p. 516.

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atmosphere. A possible slow-down in ocean circulation may also reduce the ocean sink capacity.<sup>191</sup> It has been proposed to bypass the natural ocean CO<sub>2</sub> uptake mechanism and inject CO<sub>2</sub> directly into the deep ocean to utilise its enormous storage capacity. Models suggest that CO<sub>2</sub> injected into the deep ocean would remain isolated from the atmosphere for several centuries, but on the millennial time scale it would recycle into the atmosphere.<sup>192</sup> Considerable uncertainties exist in our understanding of deep ocean chemistry and biology and the potential adverse impacts on ocean ecosystems. In addition, despite many years of theoretical work and small-scale experiments, the feasibility of ocean storage has not been demonstrated and the technologies for deep ocean CO<sub>2</sub> transport and dispersal are yet to be developed.

- *Mineral carbonation* involves reaction of CO<sub>2</sub> with metal oxides that are present in common, naturally occurring silicate rocks. The process mimics natural weathering phenomena, and results in natural carbonate products that are stable on a geological time scale. There are sufficient reserves of magnesium and calcium silicate deposits to fix the CO<sub>2</sub> that could be produced from all fossil fuel resources. Though the weathering of CO<sub>2</sub> into carbonates does not require energy, the natural reaction is slow; hence as a storage option the process must be greatly accelerated through energy-intensive preparation of the reactants. The technology is still in the development stage and is not yet ready for implementation, however studies indicate that a full CCS system with mineral carbonation would need 60-180 per cent more energy than a power plant with equivalent output without CCS.<sup>193</sup>

Of the storage options, geosequestration is thought to be the most promising due to higher confidence in the longevity of storage; large capacity of potential storage sites; and greater understanding of the mechanisms of storage. There has been considerable knowledge gained through the widespread use in the oil industry of underground CO<sub>2</sub> injection for enhanced oil recovery (EOR), which is directly applicable to geosequestration.

### Geological and engineering considerations

The geological formations most suitable for CO<sub>2</sub> storage are sedimentary basins. This is due to their relatively high porosity, allowing CO<sub>2</sub> to permeate through the pore spaces between grains or minerals and utilise the enormous pore volume for storage. The main types of formations under consideration for CO<sub>2</sub> storage are:

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191. *ibid.*, p. 533.

192. See IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, Working Group III of the Intergovernmental Panel on Climate Change [B. Metz, O. Davidson, H. de Coninck, M. Loos and L. Meyer (eds.)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, p. 280.

193. *ibid.*, p. 330.

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- saline aquifers
- oil and gas fields, either already depleted or for enhanced recovery, and
- coal seams, either unmineable or for methane recovery.

Saline aquifers have been identified as the most promising option due to their prevalence in and around Australia and their large storage capacity. They have been estimated to represent 94 per cent of Australia's feasible geological storage capacity.<sup>194</sup> However, depleted oil fields are likely to be the most readily utilised storage option in the shorter term due to their pre-existing comprehensive characterisation (that is, there is a lot of relevant data available on the fields). Site characterisation has been identified as the most time-consuming and costly component of the CO<sub>2</sub> storage site selection process and may require generation of new data and modelling capabilities.<sup>195</sup>

For effective geological storage, CO<sub>2</sub> must be injected and maintained in a state that allows ready diffusion through pore spaces but is compressed in volume. This state is maintained under the high pressure at depths greater than 800 metres.<sup>196</sup>

There must be an effective trapping mechanism or combination of mechanisms to retain the CO<sub>2</sub> within the rock formation. Physical trapping mechanisms include impermeable rock seals (caprock), or structural traps such as faults or slips in the rock. Hydrodynamic trapping results where CO<sub>2</sub> is injected and dissolved into deep saline aquifers or water within the rock pores: if the distance between the injection site and the end of the impermeable formation is hundreds of kilometres, it may take millions of years for the fluid to reach the surface.<sup>197</sup> Geochemical interactions with the rock and water within the formation can further stabilise the CO<sub>2</sub>, leading to CO<sub>2</sub> being converted to carbonate ions over hundreds to thousands of years and finally to stable carbonate minerals over thousands to millions of years.<sup>198</sup> Bonding of CO<sub>2</sub> onto the rock surface is another stabilising mechanism that occurs in coal formations.

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194. J. Bradshaw, G. Allinson, B. E. Bradshaw, V. Nguyen, A. J. Rigg, L. Spencer and P. Wilson, 'Australia's CO<sub>2</sub> geological storage potential and matching of emission sources to potential sinks', *Energy*, vol. 29, 2004, pp. 1623-31.

195. See CO2CRC, *Storage Capacity Estimation, Site Selection and Characterisation for CO<sub>2</sub> Storage Projects*, Report no. RPT08-1001, March 2008.

196. See International Energy Agency, *Geological Storage of Carbon Dioxide – Staying Safely Underground*, International Energy Agency Greenhouse Gas R&D Programme, January 2008.

197. S. Bachu, W.D. Gunter, and E. H. Perkins, 'Aquifer disposal of CO<sub>2</sub>: hydrodynamic and mineral trapping'. *Energy Conversion and Management*, 1994, vol. 35, pp. 269-79.

198. IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, op. cit.

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### Australia's geological storage capacity

The Geological Disposal of CO<sub>2</sub> (GEODISC) program (1999-2003) of the Australian Petroleum Cooperative Research Centre (APCRC) was established to evaluate the technological, environmental and commercial feasibility of geosequestration in Australia. The program found that Australia's geological storage capacity was likely to be sufficiently large and accessible to present a viable emissions mitigation option. Based on these findings, the Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC) was proposed and funded from 2003 to investigate CO<sub>2</sub> capture and storage technologies and options for Australia.<sup>199</sup>

The APCRC identified a mismatch between location of CO<sub>2</sub> emissions sources and potential CO<sub>2</sub> storage sites, with the majority of suitable storage sites being in Western Australia (mostly offshore) and the majority of sources being in eastern Australia.<sup>200</sup> The greatest capacity was identified in deep unused saline formations with reliance on hydrodynamic trapping.

Research within the GEODISC program estimated that Australia's 'viable capacity' for geological storage could sequester up to 25 per cent of our annual net emissions, or 50 per cent of emissions from major stationary sources.<sup>201</sup> However, methodology for assessment of potential CO<sub>2</sub> storage sites in terms of geological, engineering, and economic considerations is still under development and as yet there is no agreement within Australia or internationally on a single assessment scheme.<sup>202</sup> The Intergovernmental Panel on Climate Change (IPCC) issued a special report on CCS in 2005, which found that little work had been done on matching CO<sub>2</sub> sources with potential storage sites, and hence assessment of viable storage capacities.<sup>203</sup>

### Potential offshore storage areas in Australia

The CO2CRC has investigated several offshore sedimentary basins for CO<sub>2</sub> storage suitability. These include the Sydney, Gippsland and Perth Basins.

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199. CO2CRC: see <http://www.co2crc.com.au/>, accessed 6 August 2008.

200. See Collins, D, *Final report on petroleum research by the Australian Petroleum Cooperative Research Centre*, May 2007.

201. The *viable capacity* estimates an annual sustainable rate of injection. It considers economic, legal and regulatory barriers to geosequestration as well as a risk rating of potential storage sites that summarises their geological, proximate and environmental suitability. Capacity based on geologic viability alone is estimated to be in the order 740 Gt CO<sub>2</sub>, or 1600 years of Australia's net emissions at the 1998 level: J. Bradshaw, et al, op. cit.; D. Collins, op. cit.

202. J. G. Kaldi, and C. M. Gibson-Poole, (eds), *Storage capacity estimation, site selection and characterisation for CO<sub>2</sub> storage projects*, CO2CRC, Report no. RPT08-1001, 2008.

203. IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, op. cit.

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- The Sydney Basin was identified as potentially problematic due to risks associated with reservoir quality and fault sealing, factors that are probably responsible for the lack of petroleum exploration activity in the area despite its proximity to the largest energy market in the country.<sup>204</sup>
- A detailed study of the Gippsland Basin found that it contained sufficient viable storage sites to accommodate all CO<sub>2</sub> emissions from the Latrobe Valley area, being able to sustain an injection rate of 50 million tonnes of CO<sub>2</sub> per year for 40 years.<sup>205</sup> The study noted that the depletion and decommissioning of some of the major oil fields from 2015-25 was likely to coincide with the need for CO<sub>2</sub> storage anticipated from capture-ready new coal developments.
- The Perth Basin has also been extensively studied for its potential to store CO<sub>2</sub>. A suitable sandstone reservoir large enough to store the total emissions from all major sources within south-western WA (estimated at 22 million tonnes of CO<sub>2</sub> per year) was identified in the offshore Vlaming sub-Basin of the Perth Basin.<sup>206</sup> The reservoir is overlain by a shale layer that provides an effective seal.

Work is continuing within the CO<sub>2</sub>CRC to comprehensively assess Australia's sedimentary basins region by region to identify the most promising CO<sub>2</sub> storage sites and estimate their capacity.

### Risks associated with geosequestration

#### CO<sub>2</sub> leakage

CO<sub>2</sub> is buoyant in most geological settings; therefore there is a risk of leakage from storage sites. Leakage may be slow and well dispersed in the atmosphere, causing no immediate damage but negating the benefit of sequestration; or it may be abrupt, potentially presenting environmental and/or health hazards. There are also concerns about subsurface CO<sub>2</sub> migrating into groundwater and affecting its chemistry; and the potential hazards of impurities injected along with the CO<sub>2</sub>.

A maximum leakage rate of 0.1 per cent per year has been suggested as providing for an effective storage policy.<sup>207</sup> Wells present the greatest leakage risk because of their

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204. R. Causebrook, *The geological storage potential of the offshore Sydney Basin*, CO<sub>2</sub>CRC, Report no. RPT05-0023, May 2005.
205. C. M. Gibson-Poole, L. Svendsen, J. Underschultz, M.N. Watson, J. Ennis-King, P.J. Ruth, E.J. Nelson, R.F. Daniel and Y. Cinar, 'Gippsland Basin geosequestration: a potential solution for the Latrobe Valley brown coal CO<sub>2</sub> emissions', *APPEA Journal*, vol. 46, 2006, pp. 413-33.
206. R. Causebrook, T. Dance and K. Bale, *South Perth Basin: Site Investigation and Geological Model for Storage of Carbon Dioxide*, CO<sub>2</sub>CRC, Report no. RPT06-0162, December 2006.
207. International Energy Agency, *Prospects for CO<sub>2</sub> Capture and Storage*, 2004, p. 95.

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inherent design aimed at bringing high volumes of fluid to the surface quickly, bypassing natural trapping mechanisms. They have been the most common cause of leaks from underground gas storage facilities.<sup>208</sup> Carbonic acid forms when CO<sub>2</sub> dissolves in saline water, and this has been shown to cause corrosion of cements that are used to plug wells.<sup>209</sup> In addition, large numbers of abandoned or orphaned wells exist that may not be adequately plugged. Natural faults and fractures can provide a similar conduit to the surface, and potential storage sites must therefore be well-characterised to identify and avoid such risks. Due to the risk of catastrophic failure, active tectonic regions are not suitable for geosequestration.

CO<sub>2</sub> is an asphyxiant at high concentrations and is denser than air so may not immediately disperse. In a well-publicised incident at Lake Nyos in Cameroon in 1986, a large volume of naturally occurring CO<sub>2</sub> came up suddenly from the lake floor and, being heavier than air, accumulated in the surrounding region, resulting in about 1700 deaths. Volcanic CO<sub>2</sub> had seeped through natural geological pathways to pool on the lake bottom, and this was subsequently disturbed, causing rapid release of a large volume of CO<sub>2</sub> to the atmosphere.

Despite this natural incident, there are several lines of evidence to suggest that CO<sub>2</sub> can be safely stored underground.<sup>210</sup>

- Several international CO<sub>2</sub> storage projects are currently underway with careful monitoring programs, and no leakage has been observed from any of them in the few years that they have been in operation.
- Buoyant fluids (oil, gas and CO<sub>2</sub>) have been trapped naturally over geological time scales, demonstrating the widespread presence of effective geological trapping mechanisms.
- The experience of the oil and gas industry in CO<sub>2</sub> injection for EOR and underground storage of natural gas has demonstrated very low release rates.
- Model studies of CO<sub>2</sub> storage in reservoirs in the North Sea suggest that in the absence of well failure or tectonic movement, other processes that drive CO<sub>2</sub> migration through the subsurface do so very slowly: one simulation over 1000 years found that less than 0.2 per cent of stored CO<sub>2</sub> moved into the overlying layers and went no further than half the distance to the sea bed; and another found that CO<sub>2</sub> would not enter the ocean for 100,000 years, and after a million years the annual release rate would be about 10<sup>-6</sup> of the stored CO<sub>2</sub>.

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208. *ibid*, p. 96.

209. Massachusetts Institute of Technology, *The Future of Coal – Options for a Carbon-Constrained World*, 2007, p. 50.

210. IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, *op. cit.*, pp. 244-246.

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Models and risk assessment methodology have been developed to assess the probability of leakage from a given site through multiple routes.<sup>211</sup> There is a high degree of confidence, therefore, that with careful site selection and preparation the risk of leakage can be very low.

Induced seismic activity and geomechanical failure

Injection of CO<sub>2</sub> at high pressure can induce fracturing and fault movement. This can potentially precipitate earthquakes, or provide pathways for CO<sub>2</sub> leakage. EOR and gas storage activities in the oil and gas industries have produced readily applicable methods to assess and control induced fracturing and fault movement. Only a few seismic events associated with well injection have been recorded, and none have been attributed to CO<sub>2</sub>-EOR. However, more experience with industrial-scale CO<sub>2</sub> storage projects is necessary to fully assess the risks of seismic activity during injection and long term storage.<sup>212</sup>

### Monitoring and verification technologies

Monitoring and verification is required to ensure that the CO<sub>2</sub> is stored safely and permanently underground, to avoid the risks described above. Many monitoring and verification technologies, including atmospheric and remote sensing measurements, are not applicable or cannot easily be applied to offshore geosequestration sites. Some of the technologies that may be applied to offshore geosequestration are detailed here.

Seismic technologies

Seismic techniques measure the velocity and energy absorption of waves or vibrations through the subsurface rock. The profile generated depends on the fluids contained in the rock, and can trace the distribution of CO<sub>2</sub> in the reservoir. The resolution decreases with depth, but low thresholds of detection should be possible for CO<sub>2</sub> that has migrated towards the surface.<sup>213</sup> The technology is applicable to offshore reservoirs, as demonstrated at the Sleipner CO<sub>2</sub> storage project in the North Sea.

Direct substrate sampling

Sampling from injection or monitoring wells can be used to assess the rate and extent of distribution of CO<sub>2</sub> through the reservoir, especially via natural or introduced tracers. In onshore situations, baseline and ongoing surveys of subsurface and near-surface water quality and composition, and sampling for CO<sub>2</sub> or tracers in air at the surface or within the soil and water can detect migration of CO<sub>2</sub> beyond the storage site. At greater expense,

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211. *ibid.*

212. *ibid.*

213. *ibid.*, p. 237.

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direct samples can be recovered at offshore geosequestration sites from dredges or cores deployed from surface ships or submersibles.

#### Deep ocean sampling

One ocean monitoring technique that has been developed uses lasers mounted on unmanned remote vehicles deployed in the deep ocean to examine the light absorption and scattering properties of materials. The technique can detect the chemical composition of gas seeps.<sup>214</sup> Other deep ocean monitoring techniques include deployment of pH and conductivity sensors in arrays, from tethered or autonomous undersea vehicles, or from ship surveys; and acoustic techniques that exploit the large difference in the speed of sound between liquid CO<sub>2</sub> and sea water.<sup>215</sup>

The high variability in background ocean carbon concentrations would make it difficult to track CO<sub>2</sub> plumes and attribute plumes to point sources, particularly if there were multiple leakage points with overlapping plumes. It has also been noted that in some parts of the ocean it may be difficult to distinguish an increase in CO<sub>2</sub> concentration due to leakage from an undersea reservoir from that due to oceanic uptake of CO<sub>2</sub> from the atmosphere.<sup>216</sup>

#### Current development and demonstration projects of the feasibility and effectiveness of geosequestration

CO<sub>2</sub> injection into underground reservoirs has been routinely employed for more than 30 years in the petroleum industry for EOR, and this technology can be directly applied to geosequestration. There are several demonstration and pilot projects underway within Australia and internationally to investigate both onshore and offshore geosequestration as a viable option for large scale CO<sub>2</sub> storage. However, the process has yet to be applied at commercial scale.

Internationally, there are three industrial scale injection projects (over one million tonnes of CO<sub>2</sub> injected per year) in operation with significant monitoring and research programs.

- The world's first industrial-scale CO<sub>2</sub> storage was at Norway's **Sleipner** gas field in the North Sea, where about one million tonnes per year of compressed liquid CO<sub>2</sub> separated from methane is injected into a deep saline aquifer 1000 metres below the sea bed. The project has been underway since 1996, and seismic surveys have demonstrated the migration of CO<sub>2</sub> through the reservoir can be effectively mapped and monitored for leakage risk assessment.

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214. P. G. Brewer, et al., 'Development of a laser Raman spectrometer for deep-ocean science', *Deep-Sea Research*, vol. 51, 2004, pp. 739-53.

215. IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, op. cit., p. 297.

216. *ibid.*, p. 298.

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- With most of its easily recoverable oil already extracted, the **Weyburn** oil field in Canada is now one of the largest EOR projects in the world. It is anticipated that 20 million tonnes of CO<sub>2</sub> will be stored over the 20-year lifetime of the project. The Weyburn CO<sub>2</sub> Monitoring Project (WCMP) has been established to study the long term integrity, safety, performance and cost implications of CO<sub>2</sub> storage. CO<sub>2</sub> injection began in December 2000. The first phase (2000-04) of the WCMP characterised the geological and hydrological nature of the reservoir, developed sampling and modelling strategies for monitoring and verification, and developed risk assessment methodologies.<sup>217</sup> However, the project identified the need for further research into monitoring and verification technologies.
- **In Salah Gas** is the largest natural gas development project in Algeria. In the world's first large-scale carbon dioxide storage project in a gas reservoir, 1.2 million tonnes per year of CO<sub>2</sub> have been separated from the gas stream and re-injected at a depth of 1800 metres since April 2004. The CO<sub>2</sub> is stored in the aquifer zone of one of the shallow gas-producing reservoirs. An estimated 17 million tonnes will be geologically stored over the life of the project, reducing the CO<sub>2</sub> emissions of the project by 60 per cent.

Several demonstration CCS projects are underway within Australia, with more in the planning stages.

- CO2CRC's **Otway** Project in south-western Victoria is researching, developing and deploying geosequestration technology in the first such project in Australia. The project will inject up to 100,000 tonnes of CO<sub>2</sub> over two years into a depleted gas reservoir at 2000 metres depth. It includes one of the most comprehensive geosequestration monitoring programs in the world. Extensive characterisation of the site has been carried out and the project was launched in April 2008, with the first injection of 10,000 tonnes in early July 2008.<sup>218</sup>
- The proposed **Gorgon** natural gas project in Western Australia is due to commence in 2009 and will capture and store 3 million tonnes of CO<sub>2</sub> per year for 40 years. CO<sub>2</sub> will be separated from the gas and injected into a saline reservoir 2000 metres beneath Barrow Island, reducing the project's emissions by 36 per cent.<sup>219</sup> An extensive monitoring program is planned.

Other Australian projects have been proposed that cover a range of CCS technologies, including: retrofitting of an existing power station for combustion in oxygen and CCS

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217. M. Wilson and M. Monea (eds.), *IEA GHG Weyburn CO<sub>2</sub> Monitoring and Storage Project Summary Report 2000-2004*, Petroleum Technology Research Centre, Regina, 2004.

218. CO2CRC's Otway Project: see <http://www.co2crc.com.au/otway/index.html>, accessed on 6 August 2008.

219. Gorgon Project: see <http://www.gorgon.com.au/>, accessed on 6 August 2008.

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(2010, **Callide**<sup>220</sup>); post-combustion capture from an existing power station (in progress, **Hazelwood**<sup>221</sup>); CO<sub>2</sub> capture from a coal bed methane power station and storage in an unmineable coal seam (2010, **Fairview**<sup>222</sup>); construction of an integrated gasification combined cycle power plant with CCS (2012, **ZeroGen**<sup>223</sup>); construction of a capture-ready power station (2011/12, **Coolimba**<sup>224</sup>); and a commercial scale Syngas underground oxygen-injected coal gasification demonstration trial (2008, **Carbon Energy**<sup>225</sup>).

Although the technology and science of geosequestration is still very much in progress, current understanding has led to the generally accepted conclusion that geosequestration can very likely effectively store CO<sub>2</sub> at greater than 99 per cent efficiency for over 100 years, and likely for over 1000 years.<sup>226</sup> A recent comprehensive MIT study addressing the role of coal in a future carbon-constrained world found that:

no knowledge gaps today appear to cast doubt on the fundamental likelihood of the feasibility of CCS.<sup>227</sup>

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220. Callide Oxyfuel Project: see [http://www.csenergy.com.au/research\\_and\\_development/oxy\\_fuel.aspx](http://www.csenergy.com.au/research_and_development/oxy_fuel.aspx), accessed on 6 August 2008.
221. Hazelwood post-combustion demonstration project: see [http://www.co2crc.com.au/research/demo\\_postcombustion.html](http://www.co2crc.com.au/research/demo_postcombustion.html), accessed on 6 August 2008.
222. Australian demonstration projects: see <http://www.co2crc.com.au/demo/ausprojects.html>, accessed on 6 August 2008.
223. ZeroGen project: see <http://www.zerogen.com.au/>, accessed on 6 August 2008.
224. Coolimba Power Project: see <http://www.coolimbapower.com.au/oxyready.html>, accessed on 6 August 2008.
225. Carbon Energy Pty Ltd: see <http://www.carbonenergy.com.au/?page=projects&section=59>, accessed on 6 August 2008.
226. 'Very likely' is a probability between 90 and 99 per cent and 'likely' is a probability between 66 and 90 per cent: see IPCC, *IPCC Special Report on Carbon dioxide capture and storage*, op. cit.
227. Massachusetts Institute of Technology, op. cit., p. 44.

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## Appendix 2

### House of Representatives Standing Committee on Primary Industries and Resources

#### Down Under Greenhouse Gas Storage: review of the draft Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill, August 2008.

##### Major Recommendations

##### Recommendation 1

The Committee recommends the inclusion within the Bill of an objects clause, providing that the legislation:

- provide greenhouse gas injection and storage proponents with the certainty needed to bring forward investment; and
- preserve pre-existing rights of the petroleum industry as far as is practicable to minimise sovereign risk to existing titleholders' investment in Australia's offshore resources.

##### Recommendation 2

The Committee recommends that the responsible Commonwealth Minister utilise established formal consultation pathways to consult with State Governments, industry and environmental organisations, with a view to achieving national consistency in the administration of GHG storage legislation.

### Access and property rights

##### Recommendation 3

The Committee recommends that no acreage be automatically excluded from consideration for selection on the grounds of pre-existing petroleum activities.

##### Recommendation 4

The Committee recommends that the process for identifying and shortlisting acreage for release should be transparent and systematic, and should consider the views and submissions of all relevant stakeholders.

##### Recommendation 8

The Committee recommends that the Government review the *Offshore Petroleum Act* and proposed amendments to provide for the development of integrated petroleum projects,

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including the injection and storage of GHG from multiple sources into a single storage formation.

### **3 Managing interactions**

#### Recommendation 9

The Committee recommends that the Bill be amended to provide for the responsible Commonwealth Minister to direct the parties to negotiate in good faith where there are potential or actual overlapping GHG storage and petroleum titles, under both pre-commencement and post-commencement petroleum titles; and that the responsible Commonwealth Minister be empowered to direct an outcome.

### **4 Investment certainty**

#### Recommendation 13

The Committee recommends that the Government consider further financial incentives for the earliest movers in this new industry, and that these incentives be made public at the earliest opportunity.

#### Recommendation 14

The Committee recommends that a process for the formal transfer of long term liability from a GHG operator to the Government be established within the proposed legislation, such transfer to be conditional upon strict adherence to prescribed site closure criteria.

### **5 GHG storage**

#### Recommendation 18

The Committee recommends consideration be given to making monitoring data associated with GHG storage project publicly available.

#### Recommendation 19

The Committee recommends the use of consultative pathways to provide feedback on the wider community's concerns to the responsible Commonwealth Minister.

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