ARC Grant Final Report: A Framework of Laws for a Sustainable Carbon Cycle
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This report offers proposals in the hope they may inform development of a more integrated and coherent legal regime for the carbon cycle. Regulation of the carbon cycle should be guided by Australia’s national and international commitments to address climate change through the reduction of greenhouse gas emissions and work towards ecologically sustainable development. While much progress has been made by the Commonwealth Government in addressing the issues of climate change and ecologically sustainable development, we believe that a stronger legal framework is needed at a federal and state level. Legal frameworks must effectively regulate activities that produce greenhouse gas emissions and activities that sequester greenhouse gas emissions. This report evaluates the current Australian approach to regulation of the carbon cycle and offers recommendations for reform.

This report was made possible by funding from the Australian Research Council. Information contained in the report constitutes the outcomes of Discovery Grant DP 1094061 entitled: ‘An Integrated Legal Regime for a Sustainable Carbon Cycle’. Research for this project was undertaken from 2010 to 2013 by the following chief investigators: Professor Sharon Christensen, Professor W D Duncan, Professor Douglas Fisher, Associate Professor Pamela O’Connor and Dr Nicola Swayne (formerly Durrant).

The findings of this project were published as a series of journal articles (see project publications lists at page 80). This report makes a number of recommendations based on the findings of the project. Recommendations are expressed in a general form for consideration by appropriate state and federal government authorities and legislatures.

The authors gratefully acknowledge our colleagues Professor Douglas Fisher and Dr Nicola Swayne of Queensland University of Technology for their advice and comments.

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April 2013
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1. SUMMARY OF RECOMMENDATIONS

**RECOMMENDATION 1: INTEGRATION OF THE CONCEPT AND PRINCIPLES OF ESD**

The concept and principles of ESD should be integrated into legislation governing all stages of the carbon cycle. ESD principles should be clearly set out in the objects of legislation and integrated into approval processes for projects across the carbon cycle. Legislation should mandate consideration of economic, social and environmental factors for approval of activities with the potential to cause environmental harm. Legislative requirements to consider and address greenhouse gas emissions from mining, petroleum and electricity projects will also be necessary to ensure ESD.

**RECOMMENDATION 2: INTEGRATION OF INTERNATIONAL, NATIONAL AND STATE POLICIES AND LAWS**

(i) Integration of laws for the carbon cycle will result in greater emissions reductions and more sustainable environmental outcomes. International, national and state climate change and environmental policy and legislation should be integrated to provide interoperability of laws at all stages of the carbon cycle.

(ii) State laws should also be integrated to ensure that nationally consistent legal standards exist for sequestration projects.

(iii) Legal instruments such as the carbon pricing mechanism must be designed to work together with other regulatory schemes.

**RECOMMENDATION 3: RIGHTS TO CARBON MUST BE CLEAR AND FULLY SPECIFIED**

When new forms of carbon rights are created, these rights should be fully specified by statute. Neither traditional categories of property nor statutory agreements are an adequate source for specifying carbon rights. Traditional rules of property and land ownership are not flexible enough and statutory agreements are too variable. Furthermore, the use of statutory agreements will create significant legal uncertainty regarding their enforceability and lead to additional transactional costs for third parties. Legislation must clarify ownership and rights to access, extract, transform and sequester all forms of carbon.
### RECOMMENDATION 4: INTEGRATION OF ADAPTIVE MANAGEMENT PRINCIPLES

The use of an adaptive management approach may be effective to govern activities with a high risk of environmental harm. Government policy for adaptive management must be integrated into the legislative framework. Regulators must have comprehensive powers to respond to emerging information about environmental impacts and harm, including powers to suspend or cancel projects.

### RECOMMENDATION 5: MANAGING THE INFORMATION COSTS OF NEW PROPERTY

Transparency of rights to carbon is necessary to facilitate dealings and reduce information costs. All forms of statutory agreements expressed to bind successors in title should be recorded and searchable through the land information system available to the public, and a mechanism introduced for prospective purchasers, mortgagees and lessees to obtain a copy. Likewise restrictions attaching to a landowner’s title, such as under the *Carbon Farming Act* should be recorded on the land title register or land information system. Consideration should be given to the role of the land title register in making interests in land and restrictions arising from carbon rights publicly available.

### RECOMMENDATION 6: ALLOCATION OF LONG-TERM RESPONSIBILITY FOR PROJECTS ACROSS THE CARBON CYCLE

The long-term risks of environmental harm cannot be adequately managed through tortious or contractual means. To protect the public interest over the longer term, responsibility for environmental harm from extraction and sequestration activities must be clearly allocated by statute.
PART A: THE CARBON CYCLE AND LEGAL REGIME
2. What is the carbon cycle?

2.1 The natural carbon cycle

The carbon cycle is a dynamic natural process which regulates the amount of carbon in the atmosphere, ocean and land surface (trees, vegetation and soil) at any given time. Carbon dioxide cycles between the atmosphere, ocean and land surface. It is absorbed by the ocean through sea surface gas exchange and the land surface through photosynthesis. Once absorbed, it is stored in ocean sediments, organic plant matter or is eventually converted from organic plant matter into fossil fuels over thousands of years. Carbon dioxide is also emitted by the ocean through sea surface gas exchange with the atmosphere, and by the land surface through respiration of plants and animals, decay of biomass and natural events such as fire. At all times, large amounts of carbon are stored in the oceans, fossil fuels such as coal, petroleum and natural gas (which effectively isolate carbon from the cycle), living plants and organic matter in the soil.\(^1\) The following diagram demonstrates the natural carbon cycle in a simple form:

![Figure 1: The Natural Carbon Cycle](image_url)

Atmospheric concentrations of carbon dioxide are determined by the balance between sources (emissions of the gas from natural systems) and sinks (the removal of the gas from the atmosphere by

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oceans and the land surface). Natural inflows and outflows of carbon to the atmosphere were approximately equal for several thousands of years prior to the industrial revolution in the late 18th and early 19th centuries. The industrial revolution brought about significant anthropogenic (human-induced) changes to the carbon cycle.

2.2. Anthropogenic changes to the carbon cycle

The most significant anthropogenic change to the carbon cycle has been the extraction and transformation of fossil fuels into energy, greatly increasing the amount of carbon dioxide emitted into the atmosphere. Emissions of carbon dioxide from fossil fuel combustion are responsible for more than 75% of the increase in atmospheric carbon dioxide concentrations since pre-industrial times.

Changes in land use, such as increased deforestation and changing agricultural practices, have also altered the natural carbon cycle and increased carbon dioxide emissions. The remainder of the increase in atmospheric carbon dioxide since pre-industrial times is attributable to land use changes. Increased carbon dioxide emissions to the atmosphere are partly offset by natural carbon dioxide ‘sinks’ on both the land surface and oceans. Natural sinks have continued to remove around half of all atmospheric carbon emissions in the past 50 years. Atmospheric concentrations of carbon dioxide would be greater without these natural sinks but have nonetheless risen considerably since the industrial revolution.

Since 1750, the concentration of carbon dioxide in the atmosphere has risen, at an increasing rate, from around 280 parts per million (ppm) to nearly 380 ppm in 2005. Anthropogenic changes to the carbon cycle and the corresponding increase in atmospheric carbon dioxide concentrations is demonstrated in the following diagram:

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5 With contributions from cement manufacture.
7 Ibid.
9 Ibid.
10 Ibid.
Main points:

- The natural carbon cycle resulted in approximately equal inflows and outflows of carbon dioxide between the atmosphere, oceans and land surface prior to human interference.

The key stages of the carbon cycle are as follows:

- **Extraction** of fossil carbon in the form of coal, oil and gas, resulting in carbon dioxide emissions to the atmosphere. This is shown in the bottom left hand corner of the diagram.

- **Transformation** of carbon through the burning of fossil fuels, resulting in carbon dioxide emissions to the atmosphere. This is also shown in the bottom left hand corner of the diagram.

- **Storage of carbon through biosequestration** of carbon from the atmosphere back onto the land surface (trees, vegetation and soil). This decreases the amount of carbon dioxide in the atmosphere and is shown in the top right hand corner of the diagram.

- Although it is not shown in the diagram, **geosequestration** of carbon into underground geological formations is a key anthropogenic stage of the carbon cycle. Geosequestration involves the capture of carbon dioxide from fossil fuel combustion, followed by transport and permanent storage of the carbon dioxide in an underground geological formation. This process will reduce the amount of emissions resulting from transformation of carbon and is therefore an important strategy for the mitigation of greenhouse gas emissions.

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11 Image originally published by Scottish Carbon Capture and Storage and reproduced here with permission. It can be found at <http://www.scifun.ed.ac.uk/downloads/ccb/Carbon-cycle.jpg>.
2.3. The carbon cycle and climate change

The substantial increase in atmospheric carbon dioxide concentrations has led to observable effects on the global climate, known categorically as ‘climate change’. It is widely acknowledged that climate change is occurring, primarily due to large-scale anthropogenic greenhouse gas emissions.\(^\text{12}\) Internationally, the Intergovernmental Panel on Climate Change has increased scientific certainty surrounding the threat of climate change and has stated that the warming of the climate system is ‘unequivocal’.\(^\text{13}\)

Climate change observed to date includes a rise in average global air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.\(^\text{14}\) Further observations include more intense and longer droughts over wider areas, an increase in the frequency of heavy rainfall events, and an increase in the frequency of heatwaves.\(^\text{15}\)

Projections of future climate change include further increases in global average air and ocean temperatures, contraction of snow cover, shrinking of sea ice in both the Arctic and Antarctic, increase in the frequency of hot extremes, heat waves and heavy rainfall events, and an increase in the intensity of tropical cyclones.\(^\text{16}\)

For Australia in particular, effects of climate change are likely to include increased frequency of drought, decline in agricultural production, potential destruction of coral reefs, reduction in water availability, increased magnitude of storm events, and decline in biodiversity including heightened extinction rates.\(^\text{17}\) The potential effects of climate change have been brought into focus recently due to a series of severe weather events in Australia, such as the 2009 Victorian bushfires and the 2011 and 2013 Queensland cyclones and floods. Although it cannot be concluded with scientific certainty that individual weather events were ‘caused’ by climate change, events may be assessed for their consistency with expectations for a warming world.\(^\text{18}\) The extreme conditions that were the backdrop to these severe weather events will be more likely to occur and will occur more often in a warmer world.\(^\text{19}\)

Future projections of climate change may be affected by a number of factors such as ‘carbon cycle-climate feedbacks’. This type of feedback affects the total uptake of carbon dioxide by ocean and land-based sinks. Warming of the climate system reduces the absorption of carbon dioxide by the

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\(^{14}\) Ibid. The Intergovernmental Panel on Climate Change states it is very likely that most of the observed increase in global average temperatures since the mid-20th century is due to the observed increase in anthropogenic greenhouse gas concentrations: 10.
\(^{15}\) Ibid.
\(^{16}\) Ibid 12-17.
\(^{19}\) Ibid.
ocean and land surface, increasing the fraction of carbon dioxide that remains in the atmosphere.\textsuperscript{20} Furthermore, carbon dioxide has an extremely long atmospheric lifetime. Once emitted, 50\% of carbon dioxide will be removed within thirty years, a further 30\% will be removed within a few centuries, and the other 20\% may remain in the atmosphere for thousands of years.\textsuperscript{21} This means that approximately half of all past and current anthropogenic carbon dioxide emissions will remain in the atmosphere for centuries, and continue to contribute to warming of the global climate for hundreds of years to come.\textsuperscript{22} Hence, policy decisions made now regarding anthropogenic carbon dioxide emissions have the potential to either avoid or ‘lock in’ a certain level of climate change for generations for come.

3. The Current Legal Regime Governing the Carbon Cycle

Numerous laws at international, national and state level purport to regulate different stages or aspects of the biological carbon cycle. Historically, the Australian legal regime has focussed on the regulation of access to and extraction of fossil fuels, and their subsequent transformation into energy. Sophisticated laws therefore exist in each Australian jurisdiction for the regulation of rights to exploit carbon reserves on land by extraction, sale and use to generate energy. Only more recently have Australian laws sought to regulate emissions from these activities either through schemes for the reduction of emissions (carbon pricing mechanism) or the creation of offset schemes to mitigate emissions, such as sequestration of carbon in biological sinks (forests, vegetation) and geological reservoirs (underground storage formations). The laws in these areas are in their infancy and as this report demonstrates the laws require further investigation and consideration by regulators to achieve the desired result of an integrated regulatory framework. A major finding from the research is that regulators face significant challenges in implementing an integrated regulatory approach for the reduction and mitigation of emissions due to the fragmented nature of current laws which operate at different levels of government.

The national and international legal and policy context contributing to the current fragmented approach to regulation of the carbon cycle in Australia is outlined below.

3.1 International, national and state context

3.1.1 International

The United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol and United Nations Rio Declaration on Environment and Development are international instruments that impact upon regulation of the carbon cycle in Australia. Australia is a party to all of these agreements.

The UNFCCC has the ultimate objective of stabilising greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Under the UNFCCC, Australia is obliged to:

(a) adopt national policies and take corresponding measures on the mitigation of climate change by limiting anthropogenic emissions of greenhouse gases and protecting and enhancing greenhouse gas sinks and reservoirs; and
(b) identify and periodically review policies and practices that encourage activities that lead to greater levels of greenhouse gas emissions.

The Kyoto Protocol aims to reduce anthropogenic greenhouse gas emissions. It imposes binding emissions reduction targets upon developed country parties and establishes a framework for the achievement of these targets, including rules for international emissions trading and the creation of offsets projects in developed and developing countries. Australia ratified the Kyoto Protocol in 2007 and became bound to comply with its provisions from 11 March 2008. Under the first commitment period of the Protocol, Australia was required to reduce its national greenhouse gas emissions to 108 per cent of 1990 levels by 2012. The second commitment period will be from 1 January 2013 until 31 December 2020. For this period, Australia has committed to reducing its national greenhouse gas emissions by at least 5 per cent below 2000 levels by 2020, and up to 15-25% below 2000 levels by 2020 depending on the strength of a global agreement beyond 2012. International negotiations for the second commitment period of the Kyoto Protocol are ongoing and parties must revisit their emissions reductions commitments for this period by 2014 at the latest. These emissions reductions targets apply to a group of seven greenhouse gases including carbon dioxide.

Australia is also a party to the United Nations Rio Declaration on Environment and Development. This international agreement recognises the need for ecologically sustainable development (ESD), which is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. The Rio Declaration sets out principles to

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26 Kyoto Protocol, above n 24, art 3(1).
27 Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, Outcome of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol – Amendment to the Kyoto Protocol pursuant to its Article 3, paragraph 9, FCCC/KP/CMP/2012/L.9 (8 December 2012) at Draft decision -/CMP.8 (‘Outcome of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol – Amendment to the Kyoto Protocol pursuant to its Article 3, paragraph 9’) art 4.
29 Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, Outcome of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol – Amendment to the Kyoto Protocol pursuant to its Article 3, paragraph 9, FCCC/KP/CMP/2012/L.9 (8 December 2012) at Draft decision -/CMP.8, Art 7. (Doha draft decision -/CMP.8, Art 7)
30 Outcome of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol – Amendment to the Kyoto Protocol pursuant to its Article 3, paragraph 9, above n 27, annex I (B).
32 Our Common Future, above n 31, ch 2.
guide parties in the implementation of ESD (‘principles of ESD’). Principle 11 requires parties to enact effective environmental legislation reflecting the environmental and development context to which it applies. A precautionary approach must be applied which requires that where there are threats of serious or irreversible damage, a lack of full scientific certainty is not a reason to postpone cost-effective measures to prevent environmental degradation. This is known as the ‘precautionary principle’. The Rio Declaration also obliges parties to promote the internalisation of environmental costs through the approach that the polluter should bear the cost of pollution, and to ensure that the right to development is fulfilled so as to equitably meet developmental and environmental needs of present and future generations. These responsibilities are known as the ‘polluter pays’ principle and the intergenerational equity principle respectively.

3.1.2 National Laws

Australia has made progress towards implementing its international obligations on a national level. First, international commitments to reduce emissions under the UNFCCC and Kyoto Protocol have been translated into a national emissions reduction target of 5 per cent below 2000 levels by 2020 and 80 per cent below 2000 levels by 2050. Australia’s international commitments to ecologically sustainable development are implemented through the National Strategy on Ecologically Sustainable Development and the Intergovernmental Agreement on the Environment. The Australian government sets the policy agenda nationally and passes laws that are within its legislative power. Heads of legislative power are set out in the Commonwealth Constitution and all national legislation must be supported by one or more of these heads. For example, legislation implementing national climate change policy could be based upon the ‘external affairs’ head of power in the Commonwealth Constitution.

The two main policy areas of relevance to the carbon cycle are climate change policy and energy policy. Currently the cornerstone of national climate change policy is the Clean Energy Future Plan, which aims to reduce greenhouse gas emissions and drive investment in clean energy. National climate change policy is constantly evolving and there is a lack of bipartisan agreement on major issues. Implementation of this policy has resulted in the following legislation:

- The Clean Energy Legislative Package – the Clean Energy Act 2011 (Cth), Clean Energy Regulator Act 2011 (Cth) and associated legislation work together to implement the carbon pricing mechanism. The carbon pricing mechanism places a price on each tonne of carbon dioxide emitted which large-scale emitters must pay. Obligations to report greenhouse gas emissions are also placed upon large-scale emitters through the National Greenhouse and Energy Reporting Act 2007 (Cth).

- The Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) – the carbon pricing mechanism does not cover Australia’s land and agriculture sector. This Act introduces a

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36 Commonwealth Constitution s 51(xix).
scheme which allows landowners and land managers to participate in the carbon pricing mechanism by earning carbon offset credits for undertaking projects that reduce or sequester greenhouse gas emissions.

Energy policy is of high importance due to Australia’s heavy reliance upon fossil fuel resources. Fossil fuels, particularly coal, comprise a large percentage of Australia’s export market and provide reliable and relatively cheap energy generation. The current national policy is to encourage further development of Australia’s fossil fuel resources, ensure the provision of accessible, reliable and competitively priced energy, enhance Australia’s domestic and export growth potential and deliver clean and sustainable energy.

A key point of policy integration between climate change and energy is the need to recognise and integrate principles of ecologically sustainable development (ESD) within the legal framework. One of the major difficulties with the integration of ESD within existing policies and laws is that most major emissions generating activities are regulated by State laws. While the Australian government has had input at a policy level through the Intergovernmental Agreement on the Environment and the National Strategy on Ecologically Sustainable Development, implementation of this agreement is dependent upon State co-operation. The Intergovernmental Agreement on the Environment provides for the division of responsibility for environmental matters between the Commonwealth, States and Territories. All parties have agreed that environmental policy and decision-making should be governed by a number of principles, including the precautionary principle, the ‘polluter pays’ principle and the effective integration of economic and environmental considerations into decision-making processes. The National Strategy on Ecologically Sustainable Development sets out Australia’s overarching goal of achieving ecologically sustainable development. It also sets out several guiding principles such as the precautionary principle, the adoption of cost effective and flexible policy instruments and the need for decision-making processes to effectively integrate both long and short-term economic, environmental, social and equity considerations.

The Environment Protection and Biodiversity Conservation Act 1999 (Cth) gives effect to the National Strategy. The aims to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources. The Act is limited in application to ‘matters of national environmental significance’ and therefore does not apply to a number of State-based activities.

For example, $40.97 billion worth of coal was exported to 37 countries from Queensland alone in the 2008-2009 financial year, and there is increasing demand from international buyers: Department of Employment, Economic Development and Innovation, Queensland’s Coal – Mines and Advanced Projects (Queensland Government, June 2010) at 1.


Definitely specified as ‘development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends’: National Strategy for Ecologically Sustainable Development, above n 35, pt 1.

Currently “matters of national environmental significance” are limited to World Heritage properties, National Heritage properties, Wetlands of international importance (Ramsar Wetlands), nationally listed threatened species and ecological communities, listed migratory bird species, protection of the environment from nuclear actions, Commonwealth marine areas and the Great Barrier Reef Marine Park: ss 12-24C.
3.1.3 State Laws

State laws and policies play a key role in the development of an integrated legal framework for regulation of the carbon cycle to achieve economic, environmental and social goals. As part of the Intergovernmental Agreement on the Environment States have agreed to integrate environmental considerations into government decision-making processes, and to ensure that policy making and program implementation is informed by the principles of ESD.\(^\text{44}\)

The ability of the Australian government to force States to comply with this agreement is limited due to the constitutional limits on the power of the Australian government. The majority of laws regulating the extraction, transformation and storage of carbon in its different forms have a connection to land ownership or use. The power to legislate for the use of land or in relation to rights over land is exclusively within the power of the States.

State governments have sophisticated law for the regulation of access to and extraction of fossil fuels, and their subsequent transformation into energy. The laws in each Australian jurisdiction are similar and generally require government approvals for mining activities.\(^\text{45}\) Several States have reviewed their mining legislation to record ESD principles as part of the objects of the legislation,\(^\text{46}\) but in most cases the legislation does not mandate consideration of ESD principles in the decision making process for the grant of approval or conditions of carrying out the activities. Whether ESD principles are given due weight in the decision making process therefore varies between jurisdictions. A failure to take ESD into account impacts on the effectiveness of policies for the reduction of emissions from these activities.

The State’s agreement to include ESD principles also extends to laws for the mitigation of emissions. Strategies for mitigating emissions include carbon capture and storage (CCS), sequestration of carbon in biological sinks (forests, vegetation); environmental offset schemes; the carbon farming initiative and the carbon pricing mechanism. Where the strategy requires the use of land its success is dependent upon appropriate regulation at the State level. Land use is an aspect of all of the above strategies except for the carbon pricing mechanism. Again the legislative approach in each State is different with principles of ESD integrated within decision making to various degrees. Most states approach the issue of climate change and ESD through specific legislation with discrete mechanisms. For most States legislate separately to regulate coal mining, extraction of coal seal gas and petroleum, general environmental issues and planning and land use issues. A different approach has emerged in Victoria where the Climate Change Act 2010 (Vic) provides whole of government approach to management of climate change and reduction of emissions. While this represents a positive step toward an integrated approach, the mechanisms for achieving the objective of the legislation, including consideration of ESD principles in decision making, are fragmented across legislation.

\(^{44}\) Intergovernmental Agreement on the Environment, above n 35, ss 3.4, 3.5.

\(^{45}\) Mineral Titles Act (NT) 40(2); Mineral Resources Act 1989 (Qld) ss 235, 402; Mineral Resources Development Act 1995 (Tas) s 69; Mineral Resources (Sustainable Development) Act 1990 (Vic) s 8; Mining Act 1992 (NSW) s 5; Mining Act 1971 (SA) s 74; Mining Act 1978 (WA), ss 85 and 155; Petroleum Act (NT), s 105; Petroleum and Geothermal Energy Act 2000 (SA), ss 10(1)(c) and 11; Petroleum and Geothermal Energy Resources Act 1967 (WA), s 49(1); Petroleum (Onshore) Act 1991 (NSW), s 7; Planning and Development Act 2007 (ACT), s 199; Petroleum and Gas (Production and Safety) Act 2004 (Qld), s 800.

\(^{46}\) See for example Mining Act 1992 (NSW), s 3A; Petroleum and Gas (Safety and Production) Act 2004 (Qld) s 3(1)(a)(i); Mineral Resources Act 1989 (Qld) s 2(d) (“encourage environmental responsibility in prospecting, exploring and mining”).
PART B: LEGISLATIVE CASE STUDIES
4. Overview of Legislative Case Studies

In response to international obligations, Australia’s legal framework aims to address reduction or mitigation of greenhouse gas emissions in order to avoid dangerous anthropogenic climate change as required by the UNFCCC, and to meet national emissions reduction targets under the Kyoto Protocol. The achievement of emissions targets requires the integration of principles of ESD into statutory frameworks for the approval of emission intensive activities, such as coal mining, coal seam gas extraction and electricity generation and the establishment of mitigation strategies such as carbon capture and storage or biological sequestration.

ESD requires the present generation to ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The proper integration of ESD within a legislative framework requires the following elements:

(a) decision-making criteria should effectively integrate both long and short-term economic, environmental, social and equity considerations;

(b) the scheme should ensure that those who generate pollution and waste should bear the cost of containment, avoidance or abatement;

(c) a lack of full scientific certainty regarding serious or irreversible environmental harm should not be used as a reason for postponing measures to prevent the harm.

The biological carbon cycle is a finely balanced and interconnected process across land, air, and water. The legal regime however, does not mirror the biological process, instead regulating human interference that has the potential for environmental harm. The focus of regulatory laws and instruments is on the stages of extraction, emission and storage as represented in the diagram below.

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47 Intergovernmental Agreement on the Environment, above n 35, s 3.5.2; Rio Declaration on Environment and Development, above n 31, principle 3.


49 Intergovernmental Agreement on the Environment, above n 35, s 3.5.4; Rio Declaration on Environment and Development, above n 31, principle 16.

The report adopts a case study approach to the examination of regulation of the carbon cycle for a number of reasons. First the regulation of land use and activities on land is within the legislative control of the State governments. Secondly, as a result there is significant diversity in the legislative approach to the regulation of emission intensive activities and mitigation strategies. Thirdly, the adoption of a case study method allows for an in-depth examination of specific State regulatory models and their strengths and weaknesses. Particular jurisdictions are chosen for individual case studies dependent upon the stage of development of laws within the jurisdiction and whether the laws were an appropriate exemplar of the approach adopted at State level.

The interaction and conflict between two State policy areas, climate change and resource development, are considered through the case studies. As highlighted above most states approach the issue of climate change and ESD through specific legislation with discrete mechanisms for separate regulation of coal mining, extraction of coal seal gas and petroleum. The case studies will consider the effectiveness of this fragmented approach in contrast to the whole of government approach in Victoria.

The case studies at pages 23 to 50 will focus first on laws purporting to regulate emissions intensive activities of mining and electricity generation and whether the approval processes for those activities effectively integrates ESD principles. As previously highlighted, the laws regulating the approval process for access, extraction and transformation of carbon within the ground are highly developed. Traditionally these laws have focussed on economic considerations related to the granting of the mining tenure, payment of royalties and rights upon extraction. It would require a significant change of policy and practice to integrate social and environmental aspects of ESD principles in the approval process. The cases studies examine the extent to which principles of ESD are currently incorporated within the decision making process, and how the legislative frameworks regulate the environmental impacts and the social impacts upon landowners resulting from access, extraction and transformation of carbon in the ground.

The second group of case studies at pages 51 to 71 examines the mitigation strategies of carbon capture and storage underground (geosequestration) and biological sequestration. ESD principles are relevant at the approval stage and can also affect the framing of conditions upon approval of the activity. The laws need to carefully balance the potential mitigation benefits with social and economic impacts, particularly where uncertainty exists in relation to the environmental impact of new technology, such as CCS. A clear and stable legal framework is also needed for sequestration projects to ensure that these novel activities are consistently regulated and commercially attractive to private entities. These case studies will examine the extent to which legal frameworks effectively integrate environmental, social and economic factors to ensure that each new mitigation strategy is a form of ecologically sustainable development.
Legislative Case Study One – Coal mining and Coal Seam Gas in Queensland

5.1 Overview Case Study One

The first case study considers two processes for the extraction of carbon from the ground, coal mining and the extraction of coal seam gas.51 This case study was chosen due to the significant role that coal mining plays in Australia’s economy and the projected growth of coal seam gas extraction, particularly in Queensland.52 The Queensland legislative framework was chosen for a number of reasons. Queensland mining is responsible for the production and export of the largest amount of coal in Australia. The framework governing approvals, access, and extracting of coal is similar to that of other jurisdictions, and therefore conclusions will be applicable to other jurisdictions. Queensland is also the first state to grapple with legal challenges of a legislative framework for the approval, access and extraction of coal seam gas and therefore provides the most appropriate exemplar.53

Regulation of coal mining and coal seam gas extraction has several purposes aligned with Queensland’s resource development and environmental policies. First, the primary purpose of the regulation is to encourage and facilitate growth of coal mining and coal seam gas extraction.54 Queensland legislation also provides that a significant aim of the regulation is to manage the development of coal and coal seam gas resources in an ecologically sustainable manner.55 The stated aim is consistent with the desire to integrate ESD principles within the regulatory framework. The case study will examine several key aspects of the regulatory framework where the integration of ESD principles should play a key role:

(i) assessment of the environmental impact of the extraction activities and what environmental controls and penalties consistent with ESD principles should be implemented;
(ii) assessment of the impact of the extraction activities on greenhouse gas emissions and what controls are or should be implemented to reduce or mitigate emissions; and
(iii) rights of access over private land to conduct extracting activities, the impact of those rights on other users of the land and how access rights should be regulated to ensure ESD.


53 Exploration and production of coal seam gas is also currently occurring on a small scale in New South Wales: see New South Wales Government, Coal Seam Gas: Informing the community <http://www.csngov.au/home>.

54 Mineral Resources Act 1989 (Qld) s 2; Petroleum and Gas (Safety and Production) Act 2004 (Qld) s 3(1).

55 Petroleum and Gas (Safety and Production) Act 2004 (Qld) s 3(1)(a)(i). Mineral Resources Act 1989 (Qld) s 2(d) (‘encourage environmental responsibility in prospecting, exploring and mining’).
5.2 Environmental Impacts of Extraction Activities

In Queensland and all other Australian jurisdictions, ownership of subterranean coal and coal seam gas is statutorily vested in the Crown.56 The Crown may grant private entities rights to extract coal and coal seam gas pursuant to a mining or petroleum tenement. Once the coal or coal seam gas has been extracted in accordance with the tenement, ownership will pass to the tenement holder.57

Mining and petroleum tenements confer significant rights on their holders. Most notably, rights to extract coal or coal seam gas are conferred, along with rights to conduct incidental or ancillary activities.58 Extraction activities result in a number of environmental impacts including impacts on surrounding land and water resources and emission of greenhouse gases. Regulation of coal mining and coal seam gas extraction must address these environmental impacts in order to ensure that carbon resources are developed in an ecologically sustainable manner.

This section of the case study examines the regulation of environmental impacts from coal mining and coal seam gas extraction, using Queensland’s regime for environmental impacts from coal seam gas extraction as an example.

The next section of the case study considers the regulation of greenhouse gas emissions as a specific environmental impact from coal mining and coal seam gas extraction.

5.2.1 Regulatory Framework

Environmental impacts from coal mining and coal seam gas extraction are regulated through the approval process, the conditions of approval imposed, and any applicable legislative obligations. All necessary approvals must be obtained before coal mining or coal seam gas extraction can be carried out.

The first requirement is the obtaining of a mining or petroleum tenement.59 The procedure generally requires public notice of application, a period open for public objections or submissions relating to the application, and finally a decision by the responsible minister.60 There are mandatory or discretionary considerations that the minister must take into account when deciding to grant or refuse the application for a mining or petroleum tenement.61 Secondly, a tenement holder must hold an

57 Mineral Resources Act 1989 (Qld), s 310; Mining Act 1978 (WA), s 85(2)(b); Bereth v Lehmann [2011] WASC 144 at [38]; Finiskey Holdings Pty Ltd v Minister for Transport for Western Australia [2001] WASC 87 at [153]; Mining Act 1992 (NSW), s 11(1); Mining Act 1971 (SA), s 18; King v Der [2010] NSWLEC 1249 at [31]; Petroleum and Geothermal Energy Act 2000 (SA), s 5(2); Petroleum and Geothermal Energy Resources Act 1967 (WA), s 11A(1); Petroleum Act (NT), s 6(2); Petroleum and Gas (Production and Safety) Act 2004 (Qld), s 28(1)(a); Mineral Resources (Sustainable Development) Act 1990 (vic), s 11(1); Mining Act 1971 (SA), s 18.
58 Mining Act 1992 (NSW), s 73; Mineral Titles Act (NT), ss 40, 44; Mineral Resources Act 1989 (Qld), s 234; Mining Act 1971 (SA), s 39(a); Mineral Resources Development Act 1995 (Tas), s 84(1)(a); Mineral Resources (Sustainable Development) Act 1990 (vic), ss 14, 42(4)(d); Mining Act 1978 (WA), s 85(1), Petroleum (Onshore) Act 1991 (NSW), s 41; Petroleum Act (NT), ss 55, 56; Petroleum Act 1923 (Qld), s 44(b); Petroleum and Geothermal Energy Resources Act 1967 (WA), s 62.
59 Mineral Resources Act 1989 (Qld), ss 235, 402; Petroleum and Gas (Production and Safety) Act 2004 (Qld), s 800.
60 See Mineral Resources Act 1989 (Qld), ch 6 pt 1; Petroleum and Gas (Production and Safety) Act 2004 (Qld), ch 2 pt 2.
61 Mineral Resources Act 1989 (Qld), s 271; Petroleum and Gas (Production and Safety) Act 2004 (Qld), s 121.
environmental authority for coal mining or coal seam gas extraction activities. A coal mining or coal seam gas extraction project will require federal environmental approval under the Environment Protection and Biodiversity Conservation Act 1999 (Cth) if it is deemed to be a ‘controlled action’. ‘Controlled actions’ are projects or activities that will have a significant impact on a matter of national environmental significance. The Environment Protection and Biodiversity Conservation Act 1999 (Cth) also establishes an Independent Expert Scientific Committee which will provide advice on the direct and cumulative impacts of coal seam gas development or large coal mining development upon water resources. This advice will be taken into account by the Minister when deciding whether to grant environmental approval. Other authorisations may also be necessary for particular projects, such as a water licence.

Environmental impacts of the proposed activity must be considered as part of the decision-making process for the grant of a mining tenement in Queensland. However the main avenue for considering and addressing environmental impacts from coal mining and coal seam gas activities is the requirement for an environmental authority. The decision-maker must consider a variety of factors when deciding whether to grant the authority, including the application, any standard conditions for the relevant activity, and all submissions made regarding the application. The environmental impacts of the proposed activities are generally determined through an environmental impact assessment (EIA).

EIA is a process for the examination and evaluation of environmental impacts, resulting in the production of an environmental impact statement used to inform the decision-maker. It does not determine the decision or bind the decision-maker to act in a particular way. An environmental impact statement will generally be required for coal mining and coal seam gas extraction activities in Queensland. A decision-maker will set out the requirements for an environmental impact statement, which must generally address the environmental impacts of the proposed activity, the proposed safeguards and mitigation measures for these impacts, and monitoring and management programs for the activity. Once completed and submitted, an environmental impact statement will be subject to a period of public consultation during which submissions may be made. The chief executive will then assess the final environmental impact statement and issue a report containing recommendations about the suitability of the project and conditions of approval that may be imposed. However the legislation does not bind the ultimate decision-maker granting the environmental authority to follow the recommendations about the suitability of the project or impose the recommended conditions of approval.

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62 Mineral Resources Act 1989 (Qld), s 391A; Petroleum and Gas (Production and Safety) Act 2004 (Qld), s 121(1)(f).
63 See above n 44.
64 Environment Protection and Biodiversity Conservation Act 1999 (Cth), pt 19 div 2B.
66 In Queensland the decision-maker must take the environmental impacts of the mining activities into account when deciding whether to grant or refuse a mining tenement: Mineral Resources Act 1989 (Qld), ss 271(2)(b) and 269(4)(j).
68 Douglas Fisher, Australian Environmental Law: Norms, Principles and Rules (Thomson Reuters, 2nd ed, 2010) 296. ‘An environmental impact statement is not a decision-making end in itself – it is a means to a decision-making end. Its purpose is to assist the decision-maker’: Primeas v Forestry Commission of NSW (1983) 49 LGRA 402 at 417 per Cripps J.
69 Ibid Environmental Protection Act 1994 (Qld) ch 3; ch 5 pt 3.
70 Ibid s 46.
71 Ibid s 41(2)(d); Environmental Protection Regulation 2008 (Qld) reg 6, sch 1.
72 Ibid Environmental Protection Act 1994 (Qld) ch 3 pt 1 div 4.
73 Ibid ss 57-59.
Secondly, conditions of approval to address environmental impacts may be imposed upon environmental authorities. The decision-maker generally has a wide discretion to impose any conditions he or she considers necessary or desirable.\(^{75}\) These conditions can require the project proponent to take action to prevent environmental harm from the activities, rehabilitate or remediate environmental harm caused by the activities,\(^{76}\) or carry out the activities in a specified manner.\(^{77}\) An environmental offset condition requiring the project proponent to undertake works, or make a monetary payment to an environmental offset trust, may also be imposed where all cost-effective on-site mitigation measures are already being taken.\(^{78}\)

Finally, there are specific duties to avoid or minimise environmental impacts or environmental harm contained in environmental protection legislation. A mining or petroleum tenement holder is generally required to rehabilitate the land after activities cease, and to take measures to avoid environmental damage or harm.\(^{79}\)

### 5.2.2 Environmental impacts from coal seam gas extraction – Queensland study

Coal seam gas extraction results in unique environmental impacts such as impacts from hydraulic fracturing, groundwater impacts and large volumes of water extracted in the process (‘produced water’).\(^{80}\) High quality agricultural land may also be impacted by coal seam gas extraction activities. Regulatory frameworks must respond to these environmental impacts although the scope and severity of cumulative effects remain unknown. The Queensland regulatory framework is chosen for the case study due to the fact that coal seam gas extraction is taking place in Queensland and the legal regime has been the subject of in depth consideration over a number of years.

#### Approvals

Queensland’s regulatory framework requires a number of approvals to be obtained for a coal seam gas project. There are economic, social and environmental impacts arising from coal seam gas extraction including significant economic incentives to undertake coal seam gas extraction,\(^{81}\) the environmental impacts of the project on agricultural land and water resources, and the social impacts of the project upon individual landowners and the wider community. Current regulation goes some way towards integrating these considerations within the decision making process. A coal seam gas project will generally need to obtain approvals including a petroleum lease under the *Petroleum and Gas (Safety and Production) Act 2004*, an environmental authority under the *Environmental Protection Act 1994*,

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\(^{75}\) Ibid s 203(1).

\(^{76}\) Ibid s 207.

\(^{77}\) Eg in Queensland, standard conditions specifying how the coal mining activities are to be carried out are imposed: Ibid ss 318D and 707A; *Environmental Protection Regulation 2008* (Qld), sch 3 pt 2 ‘Code of Environmental Compliance for Mining Lease Projects’.

\(^{78}\) *Environmental Protection Act 1994* (Qld) ss 207, 209.

\(^{79}\) Ibid ss 264, 319, 437-440.


and an approval under the *Strategic Cropping Land Act 2011*. Federal environmental approval may also be required under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) where the project is likely to have impacts on a matter of national environmental significance.\(^82\) Decisions to grant an environmental approval and an approval under the *Strategic Cropping Land Act 2011* will consider and address environmental impacts from coal seam gas extraction, including the imposition of conditions of approval for the carrying out of the project.

Approvals under the *Strategic Cropping Land Act 2011* are specifically designed to protect land that is highly suitable for cropping and manage the impacts of development on that land.\(^83\) The Act divides impacts of development into ‘temporary impacts’ and ‘permanent impacts’ and provides for a simplified compliance framework for activities that have a ‘temporary impact’ upon the land.\(^84\) Activities with a ‘temporary impact’ include common components of a coal seam gas project such as access tracks, underground pipes and coal seam gas wells.\(^85\) In cases where a coal seam gas project is not considered to have a ‘permanent impact’ upon strategic cropping land, a full development assessment will not be required under the *Strategic Cropping Land Act 2011*.\(^86\) This may result in a failure to thoroughly consider and address the environmental impacts of coal seam gas extraction on agricultural land.

**Ongoing management**

Once all of the necessary approvals have been granted for coal seam gas extraction, uncertainty surrounding the scope and severity of environmental impacts is likely to continue throughout the life of the project. The Queensland government is attempting to respond to this ongoing uncertainty by taking an ‘adaptive management’ approach to the regulation of environmental impacts.\(^87\) An adaptive management approach is a system of ‘learning by doing’ and it has traditionally been applied to complex environmental problems where ecological uncertainty is present.\(^88\) Adaptive management is designed to assist regulators to learn about complex ecological systems by monitoring the results of a suite of management initiatives.\(^89\) It is not a decision-making framework\(^90\) but does have an important role to play in the decision framework.

Adaptive management is an approach that ensures management not only plans and carries out actions to achieve objectives, but also measures the results so that it can be seen what is working and what is not, and consequently make informed decisions and adjustments to enhance the achievement of

\(^{82}\) See above n 44. The current Environment Protection and Biodiversity Conservation Amendment Bill 2013 seeks to create a new matter of national environmental significance for coal seam gas and large coal mining developments which are likely to have a significant impact on a water resource.

\(^{83}\) *Strategic Cropping Land Act 2011* (Qld) s 3.

\(^{84}\) Ibid s 81.

\(^{85}\) Queensland Government, ‘Strategic Cropping Land Standard Conditions Code for Resource Activities’ (Department of Natural Resources and Mines, December 2012) at 3; *Strategic Cropping Land Act 2011* (Qld) s 81; *Strategic Cropping Land Regulation 2011* (Qld), s 8.

\(^{86}\) *Strategic Cropping Land Act 2011* (Qld) ss 77, 81, ch 3 pt 5.


\(^{89}\) Ibid 2412.

objectives and the delivery of desired outcomes. To be successful, the regulator must be able to process the necessary information and draw meaningful conclusions. It must be clear who decides how and when management practices will be changed, based on that evidence and why.

The Queensland regime describes itself as taking an ‘adaptive management’ approach to the regulation of coal seam gas extraction. The Government states that this approach will allow for:

- the government to monitor the industry and instigate change where required;
- the alteration of environmental conditions placed on a project on the basis of new information, monitoring or modelling which suggests the potential for unintended or unexpected impacts on the environment; and
- best practice environmental management to be implemented as technologies develop over time.

This adaptive management approach is set out in various policy statements on Queensland government websites. However, implementation of a true adaptive management approach must go beyond policy statements. The adaptive management approach, particularly evaluation and learning processes, should be formally integrated into the legislative framework.

First, this requires the objectives and key desired outcomes of the adaptive management framework to be clearly specified in the relevant legislation, and the appropriate strategies and actions to be taken to achieve these objectives and key desired outcomes.

Secondly, formal requirements for evaluation and reporting on the effectiveness of the management approach should be included as part of the legislative framework. This will include setting out the range of potential performance indicators that can be used to monitor or measure the effectiveness of the management approach, such as the indicators for a change in management approach.

Thirdly, legislation should also specify how the outcomes of learning and evaluation processes will be translated into action including: how findings of monitoring and evaluation will be reported in a transparent and credible manner; and who will be responsible for adjustments in the management approach in response to the results of evaluation. Overall there must be sufficient flexibility and responsiveness within the broader regulatory framework to allow the Government to alter its

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93 Ibid.
96 Pahl-Wostl, above n 92, 18; Gregory et al, above n 88, 2413.
97 Jones, above n 91, at 256.
98 Ibid 237.
99 Ibid 256.
100 Ibid 239.
101 Ibid 240.
102 Ibid.
regulatory approach in response to the information and conclusions established through the adaptive management approach.  

The cornerstone of an adaptive management regime is the ability of regulators to respond to new information and data and adjust the regime accordingly. Currently, Queensland legislation sets out a number of obligations aimed at addressing the environmental impacts of hydraulic fracturing, groundwater impacts, and produced water impacts. There is some provision for adjustment of the regime in accordance with new information on environmental impacts. The relevant legislative provisions are set out below.

**Hydraulic fracturing**

Hydraulic fracturing is a technique used to extract coal seam gas through stimulating the well by pumping a fluid (comprised of water, sand and chemical lubricants) under pressure to open up cracks and fracture the coal seam to increase gas production. Concerns surrounding hydraulic fracturing include the use of chemical additives in the fracturing fluid and the potential for impacts on the structural integrity of underground aquifers. In response to this, legislative restrictions on the use of certain chemical additives in fracturing fluids have been introduced.  

A number of reporting and notification requirements for the carrying out of hydraulic fracturing are placed upon tenement holders. These are mainly obligations to provide the regulator and/or landowner with details of fracturing activities, to report well head leaks and other prescribed ‘incidents’, and to notify the regulator of any environmental harm or damage to aquifers caused by fracturing. There are penalties for a failure to notify as required under the legislation. There are other general legislative provisions setting out consequences upon notification of environmental harm. An environmental report about the activity causing the harm may be required under the *Environmental Protection Act 1994*. The regulator may then exercise general powers to impose a transitional environmental program, amend the conditions of the environmental authority, serve an environmental protection order on the project proponent or take any other action it considers appropriate. The general terms of the legislation provide scope for adjustment of the conditions applying to coal seam gas extraction in response to environmental harm. Hydraulic fracturing could conceivably cause ‘environmental harm’ as defined by the *Environmental Protection Act 1994*. However, there are no specific legislative provisions for regulatory responses to new information regarding the environmental impacts of hydraulic fracturing. Regulatory responses could include requiring further

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103 Gregory et al, above n 88, at 2421.
106 See *Environmental Protection Act 1994* (Qld) s 206(4)(a); *Environmental Protection Regulation 2008* (Qld) s 81B; *Petroleum and Gas (Production and Safety) Act 2004* (Qld) s 553; *Petroleum and Gas (Production and Safety) Regulation 2004* (Qld) ss 30A, 35, 35A.
108 *Petroleum and Gas (Production and Safety) Act 2004* (Qld) s 706(3); *Petroleum and Gas (Production and Safety) Regulation 2004* (Qld) s 11, sch 2.
109 *Environmental Protection Act 1994* (Qld) ss 320 - 320E.
110 Ibid ss 320B, 320C, 320D; *Petroleum and Gas (Production and Safety) Act 2004* (Qld) ss 553, 706(3).
111 *Environmental Protection Act 1994* (Qld) ss 321-329.
112 Ibid s 326H.
113 Ibid s 14.
safeguards for hydraulic fracturing or requiring the project proponent to cease hydraulic fracturing altogether.

**Groundwater impacts**

Coal seam gas extraction may result in significant impacts on aquifer interaction including water flow and cross contamination, and interference with structural integrity and artesian pressure. The cumulative impacts of multiple coal seam gas projects in the Surat and Bowen basins on groundwater are unknown. An adaptive management approach to this issue would require regulatory powers to adjust the management regime in response to new information about direct and/or cumulative environmental impacts upon groundwater resources. Ideally, a regional scale, multi-state and multi-layer groundwater flow model of the cumulative effects of multiple developments should be used to set the parameters for an adaptive management framework. In the meantime, a precautionary approach to approval of projects is recommended.

The Queensland approach to groundwater regulation purports to apply the principles of adaptive management through a combination of monitoring, assessment, reporting and management of impacts. The *Water Act 2000* (Qld) requires tenement holders to use all best efforts to acquire all information regarding relevant water bores in the tenement area, and prepare a baseline assessment plan for all identified water bores before commencing operations. The tenement holder must prepare an underground water impact report containing measures for an ongoing water monitoring strategy to be approved by the Queensland Water Corporation. This report must be supplied within 14 months of the grant of tenure and every three years thereafter. Where there are multiple tenure holders in one area, this will be a declared cumulative management area and Queensland Water Corporation will be responsible for monitoring and reporting of groundwater impacts in the area. Additionally, the *Water Act 2000* (Qld) contains trigger thresholds for the impacts of coal seam gas activities on groundwater drawdown in bores and springs. Once triggered, a tenement holder may be required to undertake a bore assessment. If the assessment reveals that the water bore has an impaired capacity and it is established that the activities contributed to a material impact on the bore water supply, the tenement holder must negotiate ‘make good’ arrangements with the bore owner. These arrangements may include restoration of water supply, providing an alternate water supply or compensation to the bore owner for loss of water supply. The tenement holder and bore owner will enter into a ‘make good agreement’ which will be binding upon both parties and all future successors in title.

Queensland regulation of groundwater impacts from coal seam gas projects is not consistent with an adaptive management approach. The legislation imposes requirements to collect data and provide

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115 Geoscience Australia and Habermehl, above n 105, 2.
116 Geoscience Australia and Habermehl, above n 105, 1.
117 Geoscience Australia and Habermehl, above n 105, 7.
118 Geoscience Australia and Habermehl, above n 105, 7.
119 Ibid s 367.
120 Ibid s 397.
121 Ibid s 370.
122 Ibid
123 Ibid
124 Water Act 2000 (Qld) ss 402, 411.
125 Ibid ss 406-412.
127 Water Act 2000 (Qld) s 422.
reports on underground water impacts, but it is not clear how the Government will determine whether, and to what extent, the existing regulatory approach requires adjustment in response to this information.\(^{128}\) The *Environmental Protection Act 1994* provides that an environmental authority may be amended where it is necessary or desirable because an underground water impact report identifies impacts, or potential impacts, on an environmental value.\(^{129}\) However specific provisions setting out thresholds for amendment of an environmental authority, and the manner in which it may be amended, are lacking.

‘Make good’ arrangements are also unlikely to adequately protect against long term impacts on underground water resources.\(^{130}\) The current approach leaves the obligation to require specific remediation of groundwater impacts in the hands of the landowners rather than the hands of the regulators, who will have the cumulative data and knowledge of the QWC. The Government will not be responsible for directing the tenement holder to take steps to ‘make good’ any damage to water bores, and the option to provide compensation to landowners means that the water supply could remain permanently affected. Furthermore, the use of ‘make good’ obligations appears to assume that the majority of groundwater impacts will be able to be mitigated or reversed. Contamination of water supply or joining of aquifers is not generally a reversible event, which could lead to permanent deprivation of water supply for particular areas of land. Failure to take measures to properly regulate this risk of serious or irreversible environmental harm may constitute a breach of the precautionary principle of ESD.

Overall, further legislative reforms are necessary in order for the Government to respond to emerging information regarding the groundwater impacts of coal seam gas extraction. This would include regulatory powers to suspend or cease coal seam gas extraction upon new information or data demonstrating an unacceptably high risk to groundwater resources.

**Produced water**

Coal seam gas development produces large volumes of poor quality co-produced water which must be managed to avoid damage to soil, vegetation and surrounding water resources.\(^{131}\) Options for disposal of produced water include re-injection to underground formations, direct discharge to the surface, impoundment in an evaporation pond or treatment and beneficial use of the water.\(^{132}\) The government’s preferred disposal option is re-injection or treatment and use of the produced water, while the use of an evaporation pond is prohibited unless there is no feasible alternative.\(^{133}\) There are several forms of approval that may be required under the *Environmental Protection Act 1994, Water Act 2000* and/or the *Petroleum and Gas (Safety and Production) Act 2004* for the treatment, use and

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\(^{128}\) However the *Water Act 2000* does allow the chief executive to direct the petroleum tenement holder to propose an amendment to the underground water report if there has been a *material change* in the information or a prediction contained in an approved underground water impact report or final report: s 392.

\(^{129}\) *Environmental Protection Act 1994* (Qld) s 215(2)(m); *Environmental Protection Regulation 2008* (Qld) s 24AB. The report must be approved under s 385 of the *Water Act 2000*. An ‘environmental value’ is: (a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or (b) another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation: *Environmental Protection Act 1994* (Qld) s 9.


\(^{133}\) *Environmental Protection Act 1994* (Qld) s 310D.
Supply of produced water. Once approval is granted, there is little legislative scope for adjustment of the regulatory approach to management of produced water in Queensland.

### 5.2.3 Conclusions

Queensland legislation does not exhibit all the necessary features of an adaptive management environmental approach. The regulatory framework for coal seam gas is ultimately designed to allow projects to proceed subject to monitoring, reporting and adjustment of industry practices as new information emerges. Responsibilities placed upon tenement holders are generally limited to reporting and notification requirements, with the exception of ‘make good’ obligations. Principles of adaptive management are not fully integrated into the statutory provisions. Once approvals for a coal seam gas project have been granted under the *Environmental Protection Act 1994*, *Water Act 2000* and the *Petroleum and Gas (Safety and Production) Act 2004*, there are minimal powers for adjustment of the management regime applying to the project. These Acts contain very little scope for amendment of the conditions of a petroleum tenement, water licence or environmental authority in response to emerging information about environmental impacts.  

One notable exception is the power to amend an environmental authority where it is necessary or desirable because of environmental impacts identified in an underground water impact report, or another relevant report accepted by the chief executive. There is also limited scope for cancellation of an environmental authority or petroleum tenement. Implementation of a true adaptive management approach would require legislation allowing for cancellation of an authority or tenement in response to emerging information that shows unacceptably high risks of environmental harm. It would also require legislative provisions conferring a range of other regulatory powers in response to emerging information on environmental impacts, including clear indicators and thresholds for application of these powers.

Even if Queensland’s statutory framework were to properly implement an adaptive management approach, there are several issues which arise from using this approach to regulate the environmental impacts of coal seam gas extraction. An adaptive management approach may conflict with the precautionary principle of ESD. This principle of ESD requires that where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. Coal seam gas development poses a potentially serious and irreversible threat to groundwater resources. Application of the precautionary principle would require measures to prevent this damage, which may only be possible through a moratorium on coal seam gas extraction until further scientific information is available.

Adaptive management requires a degree of risk taking, as policies are implemented as experiments with uncertain outcomes. However it may be impossible to know which policy or management option will attain the desired goal in the face of great uncertainty about the dynamics of the system under

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134 Apart from minor or clerical amendments, the Minister may only amend a condition or impose a new condition on a petroleum tenement as a form of noncompliance action. Non compliance action can be taken in certain circumstances such as where the tenement holder has breached the Act or tenement conditions, used the land for an unauthorised activity, or been convicted of an offence under Chapter 3 of the *Water Act 2000: Petroleum and Gas (Production and Safety) Act 2004* (Qld) ss 790, 791, 848. There are also limited parameters for the amendment of a water licence under the *Water Act 2000*: ss 217, 218. Ch 3 imposes offences for failing to give an underground water impact report, failing to prepare a baseline assessment report, etc.

135 *Environmental Protection Act 1994* (Qld) s 215(2)(m); *Environmental Protection Regulation 2008* (Qld) s 24AB.

136 This action may only be taken in limited circumstances such as where the holder obtained the authority or tenement through provision of false or misleading information, or is convicted of an environmental offence: *Environmental Protection Act 1994* (Qld) s 278; *Petroleum and Gas (Production and Safety) Act 2004* (Qld) ss 790, 791.


138 See *National Water Commission*, above n 130.
management. There is a significant degree of uncertainty surrounding the long-term cumulative impacts of coal seam gas extraction on groundwater resources. This will increase the difficulty of applying an adaptive management approach to regulate these impacts.

A true adaptive management approach is likely to include regulatory powers to cancel or suspend a petroleum tenement where new information shows that the risk of environmental harm has become unacceptably high. The impacts of legislating for a power to cancel or suspend a petroleum tenement on these grounds must be considered. A petroleum tenement is a form of property and although there are no rights to compensation for acquisition of property under Queensland legislation, cancellation of a petroleum tenement is likely to have severe economic and social impacts upon the tenement holder.

5.3 Impact of Greenhouse Gas Emissions from Extraction Activities

Greenhouse gas emissions are a significant environmental impact resulting from the extraction of carbon. Coal mining and coal seam gas extraction produce substantial amounts of greenhouse gas emissions. Regulatory action for the reduction or mitigation of greenhouse gas emissions from coal mining activities and coal seam gas extraction is necessary to meet Australia’s commitments to reduce greenhouse gas emissions and to implement the principles of ecologically sustainable development. There are several legal instruments that could be used to regulate greenhouse gas emissions from coal mining and coal seam gas extraction, although currently there is no specific requirement to consider greenhouse gas emissions as part of the approval process in Queensland.

5.3.1. EIA process
First, the environmental impact assessment (EIA) process for the grant of an environmental authority could be used as the first step in regulating greenhouse gas emissions. The EIA process has been previously outlined. In Queensland, EIA is mandatory for large-scale coal mining and coal seam gas extraction projects. The federal Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBCA) also requires an EIA process to be undertaken for projects that will have a significant impact on a matter of national environmental significance. The difficulty in establishing the necessary causal link between greenhouse gas emissions from coal mining activities and a “significant impact on a matter of national environmental significance” means that the EPBCA is not usually applied. Where the proposed activity requires approval under both the EPBCA and Queensland

140 National Water Commission, above n 130.
141 Compensation is only payable for acquisition of ‘land’ which means ‘land, or any estate or interest in land, that is held in fee simple’: Acquisition of Land Act 1967 (Qld) s 12, sch 2 dictionary. A petroleum lease is not an interest in land: Petroleum and Gas (Production and Safety) Act 2004 (Qld) s 30.
142 Large-scale projects are those which meet certain thresholds regarding the amount of coal removed, the area of land disturbed, etc see Department of Environment and Heritage Protection, Guideline: Triggers for environmental impact statements under the Environmental Protection Act 1994 for mining, petroleum and gas activities (Queensland Government) <http://www.ehp.qld.gov.au/management/impact-assessment/pdf/eis-guideline-trigger-criteria.pdf>.
143 See above n 44.
legislation, the Queensland EIA process may be accredited, rendering the Commonwealth EIA process unnecessary.\textsuperscript{145}

Queensland EIA provisions, including the nature, purpose and scope of the legislation and the potential content of an environmental impact statement, are broadly stated.\textsuperscript{146} The provisions of the Queensland legislation are capable of operating to require information about the environmental impacts of greenhouse gas emissions from proposed coal mining or coal seam gas extraction activities, but this does not always occur in practice.\textsuperscript{147} Queensland policy documents specifically require an inventory of greenhouse gas emissions and proposals for greenhouse gas abatement measures as part of an environmental impact statement,\textsuperscript{148} but there is no legislative requirement for consideration of the environmental impacts from greenhouse gas emissions as part of the EIA.

5.3.2. Approval stage

Greenhouse gas emissions from coal mining or coal seam gas extraction could be considered and addressed during the decision-making process for the grant of: (i) an environmental authority; or (ii) a mining or petroleum tenement.

First, there is scope for consideration of environmental impacts from greenhouse gas emissions during the decision-making process for grant of an environmental authority. In Queensland, decision-makers are required to consider ‘standard criteria’ when making the decision to grant an environmental authority.\textsuperscript{149} These criteria include the precautionary principle, intergenerational equity, and conservation of biological diversity and ecological integrity.\textsuperscript{150} Environmental impacts of greenhouse gas emissions, specifically climate change, are likely to cause serious and irreversible harm, affect future generations and adversely affect biological diversity and ecological integrity. Therefore, consideration of the standard criteria would arguably encompass consideration of the environmental impacts of greenhouse gas emissions. This may not always occur in practice. A significant obstacle evident from a number of judicial review decisions concerning authorisations for coal mining activities is the establishment of a causal link between the activities, climate change and environmental impacts. It has proven extremely difficult to demonstrate a causal link between greenhouse gas emissions from particular coal mining activities and environmental impacts.\textsuperscript{151} Even where a causal link is found, consideration of environmental impacts caused by greenhouse gas emissions is only one factor which the decision-maker must take into account along with social and economic considerations. In light of the strong political, economic and social drivers for coal mining and coal seam gas extraction in Queensland, environmental impacts caused by greenhouse gas emissions from these activities are likely to cause serious and irreversible harm to future generations and adversely affect biological diversity and ecological integrity.

\textsuperscript{146} Environmental Protection Act 1994 (Qld) ch 3.
\textsuperscript{147} See for example, Gray v Minister for Planning (2006) 152 LGERA 258 at [271] – [272] where certain greenhouse gas emissions were not included in the EIA process. However it appears that inclusion of greenhouse gas emissions in the EIA process is becoming more common: see Xstrata Coal Qld Pty Ltd v Friends of the Earth [2012] QLRC 13 at [488] – [503]; Lester v Minister for Planning and Ashton Coal Operations Pty Ltd [2011] NSWLEC 213 at [56].
\textsuperscript{149} Environmental Protection Act 1994 (Qld) ss 175, 176.
\textsuperscript{150} Ibid sch 4 Dictionary.
emissions may be relegated to a subsidiary consideration. Additionally, there is limited availability for review of decisions to approve coal mining or coal seam gas extraction activities.

Secondly, there may also be scope for consideration of environmental impacts from greenhouse gas emissions in the decision-making process for the grant of a mining tenement. Queensland legislation requires consideration of adverse environmental impacts as part of the decision-making process for grant of a mining tenement. The legislation is terse and its application in practice amounts to little more than an acknowledgement of environmental impacts and referral to the existence of an environmental authority.

A failure to consider the environmental impacts of greenhouse gas emissions from coal mining or coal seam gas extraction as part of the decision-making process for approvals may breach the principle of ESD that economic, social and environmental considerations should be integrated into the decision-making process. Specific legislative duties for decision-makers to consider environmental impacts of greenhouse gas emissions from coal mining and coal seam gas extraction may be necessary to redress this.

5.3.3. Conditions of approval

Thirdly, once approval has been granted for coal mining or coal seam gas extraction, the imposition of conditions of approval upon mining or petroleum tenements and environmental authorities could be used to regulate greenhouse gas emissions. These conditions should be cost-effective and proportionate to the environmental issue being addressed, in accordance with the principles of ESD. It appears that current legislation will authorise the imposition of conditions of approval for the reduction or mitigation of greenhouse gas emissions upon an environmental authority or mining or petroleum tenement. However conditions of approval requiring reduction or mitigation of greenhouse gas emissions are seldom imposed in practice. This may be due to difficulties in demonstrating a causal link between greenhouse gas emissions from coal mining or coal seam gas extraction and environmental impacts.

Specific legislative requirements for imposition of conditions for the reduction or mitigation of greenhouse gas emissions may be necessary to facilitate compliance with Australia’s international obligations. Obligations to reduce or mitigate greenhouse gas emissions may be imposed upon a tenement holder in several forms, including requirements to take measures to minimise emissions at their source or mitigate emissions through the purchase of carbon offset credits such as those generated under the Carbon Farming Initiative. Imposition of such conditions may be challenging in practice due to the lack of technology to quantitatively measure greenhouse gas emissions from coal mining and coal seam gas extraction. There is also an unsatisfactory level of uncertainty surrounding

152 See for example, Re Xstrata Coal Queensland Pty Ltd [2007] QLRT 33 at [23]; Xstrata Coal Qld Pty Ltd v Friends of the Earth [2012] QLC 13 at [576] – [581], [601].

153 Mineral Resources Act 1989 (Qld) ss 269(4)(j), 271(b).


156 Environmental Protection Act 1994 (Qld) ss 203, 207, 209.

157 A condition requiring offset of scope one emissions of a mining project would be within the scope and purpose of the power conferred on the Minister to impose conditions of approval by the environmental and planning legislation: Hunter Environment Lobby Inc v Minister for Planning [2011] NSWLEC 221 at [92], [93]. Note that the decision was appealed but this issue was not addressed on appeal: Hunter Environment Lobby Inc v Minister for Planning (No 2) [2012] NSWLEC 40 at [15] – [20].
the development of the market for offset credits under the Carbon Farming Initiative. It is unlikely that a condition requiring these types of offsets will be imposed.\textsuperscript{158} However, it is important to note that emissions from coal mining and coal seam gas extraction are likely to be regulated under the carbon pricing mechanism. Any conditions of approval for the mitigation or reduction of greenhouse gas emissions should work together with the carbon pricing mechanism and avoid the imposition of ‘double liability’.

In conclusion, environmental protection legislation could be applied to regulate greenhouse gas emissions from coal mining and coal seam gas extraction. The \textit{Environmental Protection Act 1994} (Qld) contains provisions that prohibit actions causing environmental harm, and restrict activities causing pollution and waste.\textsuperscript{159} The relevant provisions are phrased in wide terms and could theoretically extend to regulate greenhouse gas emissions caused by coal mining and coal seam gas extraction in the following manner:

(a) The act of causing environmental harm through greenhouse gas emissions from coal mining or coal seam gas extraction activities could be an offence; and/or

(b) Greenhouse gas emissions from coal mining or coal seam gas extraction activities could be regulated as pollution, contamination or waste, and restrictions placed on their emission.

In practice, environmental protection legislation is not applied to regulate greenhouse gas emissions.\textsuperscript{160} It appears that legislative amendments will be required in order to achieve this, such as specifically listing greenhouse gas emissions as a ‘prescribed contaminant’ in Queensland legislation.\textsuperscript{161}

Overall, legal instruments that could be used to regulate greenhouse gas emissions from coal mining and coal seam gas extraction are not applied in this manner. The result is that environmental impacts from greenhouse gas emissions are neither considered or addressed during the approval process, nor regulated throughout the life of a coal mining or coal seam gas extraction project.

\section*{5.4 Managing Access to Private Land for Extraction Activities}

Access to private land for coal seam gas extraction projects has recently proven to be a contentious issue in Queensland and New South Wales. Impacts from these projects on landowners include disruption of land-use practices, surface impacts (including subsidence), air, water and soil contamination, and other social and economic impacts.\textsuperscript{162} Regulation of access to private land must balance environmental, economic and social considerations in order to ensure ecologically sustainable development.

Queensland’s legal regime provides an instructive model for the management of land access for extraction activities. The regime is based upon a statutory process for entry upon private land which a tenement holder must comply with. Mandatory best practice guidelines for good relations between tenement holders and private landowners are also outlined in the \textit{Land Access Code}.\textsuperscript{163} Queensland’s

\begin{itemize}
  \item \textsuperscript{158} See comments of Pain J in \textit{Hunter Environment Lobby Inc v Minister for Planning (No 2)} [2012] NSWLEC 40 at [17].
  \item \textsuperscript{159} \textit{Environmental Protection Act 1994} (Qld) ss 437, 438, 440, 443.
  \item \textsuperscript{160} See, for example, \textit{Gray v Macquarie Generation} [2010] NSWLEC 34.
  \item \textsuperscript{161} In Queensland, restrictions on disposal of contaminants or waste only apply to the release of prescribed contaminants: \textit{Environmental Protection Act 1994} (Qld) s 442. Greenhouse gas emissions are not a prescribed contaminant.
  \item \textsuperscript{162} National Water Commission, above n 130.
\end{itemize}
land access framework is substantially identical for all major resources projects including mining, petroleum, geothermal and greenhouse gas storage.\textsuperscript{164}

The holder of a petroleum tenement will have rights to access private land comprised in the tenement and to carry out authorised activities on the land. These rights are subject to compliance with the statutory process for land access and the \textit{Land Access Code}. Tenement holders may also use other mechanisms to gain land access for a resource development project. For example, an easement over the land or Ministerial permission to enter land may be obtained instead of, or in conjunction with, the statutory land access framework.\textsuperscript{165}

\textbf{5.4.1 The Land Access Code}

The \textit{Land Access Code} was introduced to address environmental and social impacts of extraction activities upon private landowners, and applies to all resource development projects in Queensland. It comprises best practice guidelines for landholders and companies about how to manage processes related to consultation and compensation, and sets out mandatory conditions of conduct that companies must comply with when undertaking authorised activities on private land. These conditions will form mandatory conditions of a petroleum authority under the \textit{Petroleum and Gas (Production and Safety) Act 2004}.\textsuperscript{166} Tenement holders are obliged to comply with the mandatory conditions of conduct\textsuperscript{167} and cannot contract out of them.\textsuperscript{168}

\textbf{5.4.2 The statutory process for land access}

A petroleum tenement holder has rights to access land inside the tenement.\textsuperscript{169} The tenement holder must provide a minimum of ten days notice to a private landowner before entering onto the land inside the tenement to carry out authorised activities.\textsuperscript{170} Additionally, the tenement holder must enter into a conduct and compensation agreement with the landowner before ‘advanced activities’\textsuperscript{171} can be carried out on the land.\textsuperscript{172} Conduct and compensation agreements must address entry to the land, carrying out of authorised activities, and compensation payable by the tenement holder to the landowner.\textsuperscript{173} The general principle is that compensation must cover any loss or damage caused by coal seam gas extraction activities, including deprivation of possession, reduction in land value or use, severance from the land and consequential damages.\textsuperscript{174} The \textit{Petroleum and Gas (Safety and Production) Act 2004} (Qld) also confers ‘access rights’ on a petroleum tenement holder to cross land \textit{outside} of the petroleum tenement where it is reasonably necessary to enter the area of the tenement and to carry out activities on the land that are reasonably necessary to allow the crossing of the

\begin{footnotesize}
\begin{itemize}
  \item \textsuperscript{164} See \textit{Mineral Resources Act 1989} (Qld) sch 1; \textit{Geothermal Energy Act 2010} (Qld) ch 6, pt 5; \textit{Greenhouse Gas Storage Act 2009} (Qld) ch 5, pt 7; \textit{Petroleum and Gas (Production and Safety) Act 2004} (Qld) ch 5 pts 2, 5.
  \item \textsuperscript{165} See \textit{Petroleum and Gas (Production and Safety) Act 2004} (Qld) ss 399, 437A, 506(4). Ministerial permission may only be obtained for land over which a pipeline licence is held and only in certain circumstances: \textit{Petroleum and Gas (Production and Safety) Act 2004} (Qld) ch 4 pt 5.
  \item \textsuperscript{166} \textit{Petroleum and Gas (Production and Safety) Regulation 2004} (Qld) sch 1A.
  \item \textsuperscript{167} \textit{Petroleum and Gas (Production and Safety) Act 2004} (Qld) s 555.
  \item \textsuperscript{168} Ibid s 533(2).
  \item \textsuperscript{169} Although the \textit{Petroleum and Gas (Production and Safety) Act 2004} (Qld) does not specifically confer this right, it presumes that the right exists, and imposes requirements that a tenement holder must meet before they can exercise it.
  \item \textsuperscript{170} \textit{Petroleum and Gas (Production and Safety) Act 2004} (Qld) ss 495–499.
  \item \textsuperscript{171} ‘Advanced activities’ are authorised activities that will have a more than a minor impact on the business or land use activities of any owner or occupier of the land on which the activity is to be carried out: Ibid \textit{Petroleum and Gas (Production and Safety) Act 2004} (Qld) sch 2 Dictionary.
  \item \textsuperscript{172} Ibid ss 500, 532. ‘Landowner’ includes both owners and occupiers of the land: \textit{Petroleum and Gas (Safety and Production) Act 2004} (Qld) s 532.
  \item \textsuperscript{173} Ibid s 533(1).
  \item \textsuperscript{174} Ibid s 532.
\end{itemize}
\end{footnotesize}
Before entry onto the land, the tenement holder must enter into an access agreement with the landowner for the exercise of the access rights, and also a conduct and compensation agreement. Both access agreements and conduct and compensation agreements are fundamentally a contract between two private parties. However, the legislation provides that both types of agreement will be enforceable against the parties and their ‘successors and assigns’, giving the agreements an extended effect that is functionally similar to a property right. ‘Successors and assigns’ will include a party who purchases the land from the original landowner or is assigned the lease from the original lessee of the land. The Land Title Act 1994 (Qld) also states that the interest of a petroleum tenement holder under an access agreement is an exception to a registered landowner’s indefeasible title. Conduct and compensation agreements are not mentioned.

A registered owner of land will hold their land subject to any interests that are recorded on the State land title register for that parcel of land. Otherwise, they have full ownership of the land unaffected by any claims to it. This is known as ‘indefeasible title’ or the ‘benefits’ or ‘protection’ of indefeasibility. However, State legislation sets out a list of exceptions to this. A registered owner will hold their indefeasible title subject to any exceptions that exist, even if the exception is not recorded on the land title register. In Queensland, a registered landowner will hold their land subject to exceptions including the interest of a petroleum tenement holder under an access agreement.

Several issues arise from the current statutory framework for land access. Legislation stating that access agreements and conduct and compensation agreements are enforceable against successive landowners is contrary to established rules of property law. First, it is likely to conflict with the legal rules for covenants running with the land. Secondly, a conduct and compensation agreement is not stated to be an exception to indefeasibility under the Land Title Act 1994. Therefore, making a conduct and compensation agreement enforceable against successive landowners may be inconsistent with the established principle of indefeasible title. The interaction of the statutory provisions is unclear and little judicial guidance is available at this early stage.

The scope of a petroleum tenement holder’s ‘interest’ under an access agreement, which gains the protection of indefeasibility, is also unclear. Any successive landowner will need to assess which terms are within the statutory scope of an ‘access agreement’ and therefore enforceable against them. This will create uncertainty and transaction costs. The lack of clarity surrounding enforceability of these agreements against third parties is compounded by the following:

(a) agreements are not noted on the land title register (although the Queensland Government is currently progressing legislative amendments to require this); and
(b) agreements are generally expressed to be confidential.

Finally, it is unclear which classes of third parties an access agreement or conduct and compensation agreement will be enforceable against. These issues should be rectified in order to provide secure land access for the duration of the project, clarify the long-term rights and obligations of tenement holders and landowners, and minimise uncertainty and transaction costs for third parties such as successive landowners.

175 Ibid s 502.
176 Ibid ss 503, 532 (1).
177 Ibid ss 507, 537E.
178 Land Title Act 1994 (Qld) s 185(1)(h).
179 See further Adrian Bradbrook and Susan MacCallum, Bradbrook and Neave’s Easements and Restrictive Covenants (LexisNexis Butterworths, 3rd ed, 2011) chs 12, 13, 14, 17.
180 See Cape Flattery Silica Mines Pty Ltd v Hope Vale Aboriginal Shire Council [2012] QSC 381.
It is noted that other issues may arise from the current land access framework such as the proper scope of compensation payable to landowners. These issues are beyond the scope of this report and are currently under review by the Queensland Government.¹⁸¹

5.5. Conclusions and Recommendations for Reform

The current legal regime addresses the environmental and social impacts of coal mining and coal seam gas extraction to some extent. Regulation to address the environmental impacts of coal seam gas extraction and the social impacts of access to private land is particularly advanced in Queensland. There are a number of reforms which could be implemented to further integrate environmental, social and economic considerations into the regulatory framework, assisting in the achievement of ESD.

5.5.1 Regulation of environmental impacts

Reform of the Queensland regime to integrate an adaptive management approach into the legislative framework requires the following elements:

- the inclusion of clear objectives, performance indicators and criteria for evaluation or response in the statutory provisions;
- the creation of an appropriate decision-making framework against which the current regulatory approach could be tested and amended; and
- design of the statutory regime with sufficient flexibility to enable changes to be made to the regulatory framework in response to improved knowledge and understanding of environmental impacts.

In particular this would require specific legislative provisions including:

- provisions in the Environmental Protection Act 1994, Water Act 2000 and/or the Petroleum and Gas (Safety and Production) Act 2004 allowing for the amendment of conditions of approval in response to new information about the environmental impacts of a particular project, or coal seam gas extraction in general
- a range of regulatory powers to respond to reports of well leaks or environmental harm caused by hydraulic fracturing
- a range of regulatory powers to respond to any new information contained in underground water impact reports regarding adverse environmental impacts
- granting power to regulators to ultimately decide to cease coal seam gas activities in the face of significant information gaps and/or an unacceptably high risk of cumulative adverse impacts

Additionally, the Government should not leave negotiations about a tenement holder’s obligation to address impacts on groundwater resources to the owners of water bores. These impacts should be addressed through legislative powers to respond to new information and adjust the terms of the water licence or environmental authority as required.

5.5.2 Regulation of greenhouse gas emissions

There are a number of current legal instruments that could be applied to regulate greenhouse gas emissions from coal mining or coal seam gas extraction. This seldom occurs in practice and legislative reform may be necessary to specifically require greenhouse gas emissions to be considered and addressed.

- Specific legislative duties should be placed upon decision-makers to require information on the environmental impacts of greenhouse gas emissions as part of the EIA process.
- Specific legislative duties should be placed upon a decision-maker to consider any environmental impacts caused by greenhouse gas emissions from coal mining or coal seam gas extraction when making the decision to grant an environmental or planning authorisation and a mining or petroleum tenement.
- Environmental impacts caused by greenhouse gas emissions could form part of a mandated hierarchy of considerations in the decision-making process; for example, by framing them as a ‘cardinal principle’ which ranks higher than social and economic considerations.
- Merits review of decisions to approve coal mining or coal seam gas extraction activities could be made available in all Australian jurisdictions.
- Conditions for the reduction or mitigation of greenhouse gas emissions should be imposed upon approvals for coal mining or coal seam gas extraction activities.

Although the carbon pricing mechanism may place liability upon tenement holders for fugitive emissions from coal mining or coal seam gas extraction, the abovementioned reforms are still necessary. A range of legal instruments is required to effectively regulate greenhouse gas emissions from coal mining or coal seam gas extraction activities, instead of dependence on a single mechanism. The carbon pricing mechanism does not affect the decision-making process to grant approval for coal mining or coal seam gas extraction or the conditions of approval which can be imposed. Furthermore, the future of the carbon pricing mechanism after the 2013 federal election is uncertain.

5.5.3 Regulation of access to private land

Access to private land for extraction activities results in economic, environmental and social impacts upon private landowners and third parties. Land access should be regulated in a clear and transparent manner to minimise economic, social and environmental impacts on landowners to the greatest extent possible. The following reforms are recommended:

- The source of the tenement holder’s right to access land inside of the petroleum tenement should be clarified in the Petroleum and Gas (Safety and Production) Act 2004.
  The enforceability of an access agreement and a conduct and compensation agreement against successive registered landowners, lessees and mortgagees should be clarified. This should include clarification of which types of terms in these agreements are enforceable against third parties (e.g., compensation clauses, access clauses, personal obligations).
- Sections 184 and 185 of the Land Title Act should be amended to: (i) clarify whether a conduct and compensation agreement is an ‘interest’ under these sections; (ii) define the scope of a petroleum tenement holder’s ‘interest’ under an access agreement.

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182 This is subject to a tenement holder meeting the pre-requisites for imposition of liability under the Clean Energy Act 2011 (Cth) such as emitting 25,000 tonnes or more of carbon dioxide annually: see Clean Energy Act 2011 (Cth) ss 20-22.
• Disclosure of the existence and contents of an access agreement or conduct and compensation agreement is recommended. The existence of either agreement should be noted on the land title register or another publicly searchable register such as the administrative advices register, and disclosure of the contents of either agreement should be required upon request of a prospective purchaser, lessee or mortgagee of the land.
6. Legislative Case Study Two – Coal Fired Electricity Generation

6.1 Overview Case Study Two

Carbon products are transformed through the burning of coal to produce electricity. Coal-fired electricity generation is a major source of emissions in Australia. The electricity generation sector is responsible for over one third of Australia’s emissions, and coal-fired electricity comprises over 75% of electricity produced. Therefore, effective reduction of emissions from coal-fired electricity generation will play a significant role in meeting Australia’s international and domestic target of reducing national emissions by five per cent below 2000 levels by 2020. This case study will analyse the Australian legal framework at Commonwealth and State level used to regulate emissions from coal-fired electricity generation. The primary legal instrument for regulation of emissions from coal-fired electricity generation is the carbon pricing mechanism (CPM). While there are other legal instruments that could be used to complement the CPM, such as environmental and planning approval process, conditions of environmental or planning approval, energy efficiency measures and the large-scale renewable energy target, the case study demonstrates that the effectiveness of the CPM is hampered by inconsistent application of these mechanisms by State governments and the significant exceptions to the application of the CPM..

This case study will examine the regulatory framework at the national and state level for reducing emission from coal fired power stations and whether the legislative framework presents an integrated model for the reduction of emissions in this sector. The principles of ESD will be used to assess the effectiveness of the framework, in particular:

(i) whether the legislative framework implementing the CPM, including assistance packages to the sector, appropriately balances environmental considerations with economic and social issues;
(ii) the continuing need for any approvals related to coal fired power stations to include conditions or targets for the lowering of GHG emissions;
(iii) the need for a coherent legal framework that manages reduction of emissions through a combination of incentives to reduce emission and penalties for failure to meet targets.

6.2 National Framework - Carbon Pricing Mechanism

The carbon pricing mechanism commenced on 1 July 2012. It is implemented through the Clean Energy Act 2011 (Cth) and associated legislation. The Act’s objects are to take flexible and cost-
effective action towards reducing Australia’s emissions by 80 per cent below 2000 levels by 2050, and to price carbon in a way that encourages investment in clean energy, supports jobs and competitiveness in the economy, and supports Australia’s economic growth while reducing pollution. The carbon pricing mechanism was enacted in a highly sensitive political environment, which is reflected in the Act’s attempts to strike a delicate balance between environmental, economic and social priorities.\textsuperscript{185} From an environmental perspective, the carbon pricing mechanism is principally aimed at reducing emissions. However, Australia’s economy is reliant upon emissions-intensive industries.\textsuperscript{186} The introduction of a carbon price without transitional assistance to ensure job security, competitiveness and economic growth would have been detrimental from an economic and social standpoint. Transitional assistance is provided under the carbon pricing mechanism to emissions-intensive, trade-exposed industries and coal-fired electricity generators.\textsuperscript{187}

The aim of introducing a carbon price is to make emissions-intensive goods and services more expensive,\textsuperscript{188} but also to make goods and services produced with low-emissions energy or technology relatively cheaper. A consequent change in behaviour should occur by lowering consumer demand for expensive, emissions-intensive goods and services, and encouraging investment in low-emissions energy and technology, eventually leading to reduction of Australia’s emissions.

6.2.1 Operation of the Carbon Pricing Mechanism

The carbon pricing mechanism is comprised of a carbon tax\textsuperscript{189} until 1 July 2015 and a cap-and-trade emissions trading scheme thereafter. The basic principle of the mechanism is that a ‘liable entity’ must purchase and then surrender an emissions unit for each tonne of carbon dioxide emitted.\textsuperscript{190} If a liable entity\textsuperscript{191} does not surrender enough emissions units to cover its emissions, it must pay a penalty.\textsuperscript{192} Eligible emissions units include carbon units that are sold by the federal Government through the Clean Energy Regulator.

The price of carbon units is fixed until 1 July 2015. A liable entity must purchase carbon units which will automatically be surrendered back to the Government. Effectively this creates a carbon tax by

\textsuperscript{185} This reflects the principle of ecologically sustainable development, which requires that economic and environmental considerations are effectively integrated into decision-making processes; National Strategy for Ecologically Sustainable Development, above n 35, pt 1; Intergovernmental Agreement on the Environment, above n 35, s 3.2.

\textsuperscript{186} Such as steel, aluminium, cement and zinc manufacturing, coal mining and coal-fired electricity generation. See also The Garnaut Climate Change Review: Final report, above n 12, ch 8.

\textsuperscript{187} Clean Energy Act 2011 (Cth) pt 7 (Jobs and Competitiveness Program), pt 8 (Coal-Fired Electricity Generation).


\textsuperscript{189} The authors acknowledge that the use of the phrase ‘carbon tax’ to describe the fixed charge years of the carbon pricing mechanism is controversial. However, we are speaking in general terms, and do not purport to classify it as a tax for constitutional or taxation law purposes. It has been acknowledged that the operation of the carbon pricing mechanism in fixed charge years is similar to a tax: International Emissions Trading Association, Greenhouse Gas Market 2011: Asia and Beyond: The Roadmap to Global Carbon and Energy Markets (2011), 3 <http://www.ieta.org/index.php?option=com_content&view=article&id=419:ghg-market-report-2011&catid=26:reports&Itemid=93>.

\textsuperscript{190} Clean Energy Act 2011 (Cth) ss 121–134.

\textsuperscript{191} A liable entity is an entity in operational control of a facility such as a coal-fired electricity generation complex. The facility must emit 25,000 tonnes or more of carbon dioxide annually. Therefore, a person who has operational control of a coal-fired generation complex with covered emissions of 25,000 tonnes or more of carbon dioxide annually will be a liable entity: Clean Energy Act 2011 (Cth) ss 20–22.

\textsuperscript{192} Clean Energy Act 2011 (Cth) ss 125, 128, 133.
requiring liable entities to pay a fixed price for each tonne of carbon dioxide emitted from 1 July 2012 until 30 June 2015.

From 1 July 2015, a cap-and-trade emissions trading scheme will commence. The Government will put a carbon pollution cap in place. The cap is the maximum number of carbon units that the Government can issue, through either auction or free allocation, for each year.\textsuperscript{193} The price of carbon units will not be fixed and will be the market price at which they are auctioned. A liable entity can purchase carbon units at an auction\textsuperscript{194} and either voluntarily surrender or trade them. Each year, liable entities must surrender enough emissions units to cover their annual emissions. The emissions trading scheme will theoretically encourage liable entities to invest in the most cost-effective ways to reduce emissions, by either introducing methods to reduce their emissions or acquiring emissions units from another liable entity.\textsuperscript{195}

There are three types of eligible emissions units that can be surrendered under the carbon pricing mechanism.\textsuperscript{196} The first type is carbon units that are sold by the federal Government through the Clean Energy Regulator. The second type is eligible international emissions units that are issued under the Kyoto Protocol or under the law of a foreign country, such as emissions units from the European Union emissions trading scheme. The third type is Australian Carbon Credit Units. These units are issued under the national Carbon Farming Initiative for eligible offsets projects. There are restrictions on the amount of international emissions units and Australian Carbon Credit Units that a liable entity can surrender in the first six years of the mechanism.\textsuperscript{197}

The aim of the carbon pricing mechanism is to reduce emissions generally, but in relation to coal-fired electricity generation specifically, as follows:

(i) A carbon price will increase the cost and lower the profitability of coal-fired electricity generation.

(ii) Changes to the business model of coal-fired electricity generators should include increases in energy efficiency, uptake of other emissions reduction methods and eventually closure of coal-fired electricity generation.

(iii) A rising carbon price will also encourage investment in low-emissions and renewable electricity generation sources, and these sources will ultimately become cost-competitive.\textsuperscript{198} This will lead to a widespread shift from coal-fired electricity generation

\textsuperscript{193} Ibid s 13.
\textsuperscript{194} Or freely allocated.
\textsuperscript{195} Peter Christoff, ‘Can the Invisible Hand Adjust the Thermostat? Carbon emissions trading and Australia’ in Tim Bonyhady and Peter Christoff (eds), Climate Law in Australia (Federation Press, 2007) 83.
\textsuperscript{196} Clean Energy Act 2011 (Cth) s 5; Australian National Registry of Emissions Units Act 2011 (Cth) s 4.
\textsuperscript{197} For the first five flexible charge years, eligible international emissions units cannot exceed 50 per cent of the units surrendered by a liable entity: Clean Energy Act 2011 (Cth) s 133(7) (eligible international units in excess of 50 per cent will be banked for the following eligible financial year). Additionally a sub-limit of 12.5 per cent will apply to eligible Kyoto units surrendered by a liable entity: The Hon Greg Combet AM MP, Minister for Climate Change and Energy Efficiency, and the European Commission, ‘Australia and European Commission Agree on Pathway towards Fully Linking Emissions Trading Systems’ (Joint Media Release, 28 August 2012) <http://www.climatechange.gov.au/minister/greg-combet/2012/media-releases/2012-August/20120828a.aspx>. Regulations may prevent certain international units from being surrendered to ensure the environmental integrity of the scheme: Clean Energy Act 2011 (Cth) s 123. In fixed charge years, ACCUs cannot exceed five per cent of the units a liable entity surrenders: Clean Energy Act 2011 (Cth) ss 125(7), 128(7), (8). Once the flexible charge years commence, there are no restrictions on the amount of ACCUs that can be surrendered by a liable entity.
to low-emissions and renewable electricity generation, resulting in overall reduction of emissions.

6.2.2 Effectiveness of CPM for reducing emissions from coal fired electricity generation

The effectiveness of the carbon pricing mechanism in achieving emissions reductions from coal-fired electricity generation will depend upon its design and specific features.

First, the **price of carbon must be high** and the carbon pollution cap must be strict and lowered annually in order to achieve significant changes in behaviour and consequently emissions reductions. There are legislative constraints on the price of carbon for the first six years of the carbon pricing mechanism. The carbon price is fixed between $23 and $26 a tonne for the first three years.\(^{199}\) Upon commencement of the emissions trading scheme on 1 July 2015, a price ceiling will be in place for three years.\(^{200}\) The price ceiling will be set at $20 above the expected price for European emissions units in the financial year commencing 1 July 2015, and rise by 5 per cent in the following two financial years.\(^{201}\) This feature is designed to allow linkage of the Australian emissions trading scheme with the European Union emissions trading scheme. To further facilitate linkage, the Government has placed restrictions upon the use of international emissions units issued under the Kyoto Protocol (Kyoto units).\(^{202}\) Effectively this will mean that:

(i) a large proportion of international emissions units surrendered under the Australian emissions trading scheme will be European Union emissions units; and  
(ii) upon transition to an emissions trading scheme on 1 July 2015, the Australian price of carbon will be set by the European Union price of carbon.\(^{203}\)

European Union emissions units were trading at below €5 per tonne in 2013,\(^{204}\) indicating that the proposed link with the European Union emissions trading scheme will significantly lower the Australian price of carbon from 1 July 2015 onwards.

Modelling of the carbon price\(^{205}\) necessary to drive a widespread shift from coal-fired electricity generation towards low-emissions or renewable electricity generation concludes that a carbon price of A$30 to A$50 per tonne is required to make other sources of electricity generation cost-

\(^{199}\) Clean Energy Act 2011 (Cth) s 100(1).  
\(^{200}\) Ibid.  
\(^{202}\) A sub-limit of 12.5 per cent will apply to eligible Kyoto units surrendered by a liable entity: The Hon Greg Combet AM MP, Minister for Climate Change and Energy Efficiency, and the European Commission, ‘Australia and European Commission agree on pathway towards fully linking emissions trading systems’ (Joint Media Release, 28 August 2012) <http://www.climatechange.gov.au/minister/greg-combet/2012/media-releases/August/JMR-20120828.aspx>. Regulations may prevent certain international units from being surrendered to ensure the environmental integrity of the scheme: *Clean Energy Act 2011* (Cth) s 123.  
\(^{203}\) *Linking and Australian liable entities*, above n 201.  
competitive. The combination of Australia’s price ceiling, and the likelihood of relatively low European Union carbon prices from 2015 onwards, will keep the carbon price from rising high enough to facilitate a switch away from coal-fired electricity generation in the first three years of the emissions trading scheme.

Secondly, the carbon pollution cap will have a significant impact on the rate of emissions reductions from coal-fired electricity generation. A fixed price of carbon alone will not change behaviour of coal-fired electricity generators who can afford to pay the price and continue emitting. By placing a carbon pollution cap upon Australia’s covered emissions, demand for the right to emit one tonne of carbon dioxide (and associated requirement to purchase a carbon unit) will increase and so will the price of carbon. As the carbon pollution cap is lowered, demand for carbon units will grow stronger and the price of carbon will rise high enough to facilitate a switch away from coal-fired electricity generation. Annual carbon pollution caps will be imposed for each year from 1 July 2015, restricting the number of carbon units that the Government can issue and theoretically placing a limit on Australia’s ‘covered emissions’.

However, covered emissions can exceed the cap where they are offset by surrender of Australian Carbon Credit Units or international emissions units. Surrender of these units will offset any excess covered emissions through the biosequestration of one tonne of carbon dioxide (Australian Carbon Credit Unit) or the emission of one less tonne of carbon dioxide in another jurisdiction (international emissions unit). The surrender of international emissions units and Australian Carbon Credit Units may result in Australia’s covered emissions significantly exceeding the carbon pollution cap. In particular it is possible that coal-fired electricity generators could continue to emit large amounts of carbon and surrender corresponding amounts of international emissions units and Australian Carbon Credit Units. Where international emissions units or Australian Carbon Credit Units do not represent credible and permanent reduction of emissions this will impact on the actual reduction of emissions.


208 Clean Energy Act 2011 (Cth) s 14.

6.3 Impacts on effectiveness of CPM to reduce emissions

6.3.1 Role of environmental and planning laws

The role of State and Territory environmental and planning laws in regulating the approval of new coal-fired electricity generation will be an important complement to the CPM. Reliance solely upon a pricing mechanism to reduce emissions is unlikely to bring about a change in behaviour sufficient to lower emissions in the short term. There is also a danger of political changes to the CPM which may lead to a reduction in the impact of the mechanism on emissions.\(^\text{212}\)

State legislative frameworks governing the establishment of power stations should complement the aims of the CPM by integrating principles of ESD within the decision making and approval process. As discussed in relation to Case Study 1, State processes for the approval of emission intensive activities should include within the environmental assessment phase specific consideration of emissions and impose conditions aimed at lowering emissions. The existing legislative framework provides scope for consideration of greenhouse gas emissions as part of the decision to grant an environmental or planning authorisation, but specific consideration is not always given in practice to the issue. Even where emissions are considered as part of the approval process rarely are conditions for the reduction or mitigation of greenhouse gas emissions imposed upon new coal-fired electricity generation. An example would include conditions requiring a generation complex to adhere to an emissions intensity standard or a carbon capture and storage-ready (‘CCS-ready’) standard could be imposed. A CCS-ready standard requires that a new coal-fired power plant is approved and built in a way that will allow the retrofitting of CCS technology at an appropriate time in the future.\(^\text{213}\) Queensland, Victoria and the Commonwealth have all indicated over recent years that CCS-ready conditions and emissions intensity conditions would be imposed upon new coal-fired electricity generation. However, all three jurisdictions subsequently reversed their position, stating that these conditions will not be necessary due to the operation of the carbon pricing mechanism.\(^\text{214}\) Other jurisdictions impose conditions for reduction or mitigation of greenhouse gas emissions from new coal-fired electricity generation on a discretionary basis or not at all.\(^\text{215}\)

Arguably approval of new coal fired power stations without imposing conditions for the reduction of emissions or use of clean energy technology places unjustifiable reliance upon the ability of the CPM to deliver reduction in emissions. Clearly further integration and coherency is required between national laws and states laws approving emission intensive activities to ensure the consideration of social, economic and environmental issues at all stages of the regulatory framework.

\(^{212}\)The future of Australia’s carbon pricing mechanism after the 2013 federal election is uncertain. The leader of the opposing Coalition Government has vowed to repeal the scheme upon gaining power. It is unclear whether this is financially, legally or politically feasible. Recent modelling by Bloomberg New Energy Finance estimates that there is only a 32% chance that the carbon pricing mechanism will be repealed after the 2013 federal election: Bloomberg New Energy Finance, *Will Australia’s Carbon Price Last? A 2013 update* (Bloomberg Finance LP, 27 February 2013) <http://about.bnef.com/white-papers/will-australias-carbon-price-last-a-2013-update/>.


6.3.2 Other legal instruments to reduce emissions

The role of several other laws and policies which aim to reduce emissions from existing coal-fired electricity generation and encourage uptake of low-emissions and renewable electricity generation will also be important. These include energy efficiency measures applying to electricity generation and the national large-scale renewable energy target. Mandatory energy efficiency obligations are imposed under the Energy Efficiency Opportunities Act 2006 (Cth). The Act requires electricity generators that meet the energy use threshold to undertake an assessment of their energy efficiency opportunities and report publicly on the outcomes of that assessment. Additionally, the large-scale Renewable Energy Target aims to generate 20 per cent of Australia’s electricity from renewable sources by 2020. The Target places a mandatory obligation upon wholesale electricity retailers and some electricity generators to acquire a set number of Large-scale Generation Certificates (LGCs) each year. The LGCs represent an amount of generated renewable energy electricity. Energy efficiency obligations, the large-scale renewable energy target and the carbon pricing mechanism are all separate legislative schemes, although the latter two are both administered by the Clean Energy Regulator.

State and Territory legislation also create offences for causing environmental harm or nuisance, and impose restrictions on undertaking activities that cause pollution or disposal of contaminants or waste. While drafted in wide terms which allow application to emissions from coal-fired electricity generation, in practice this is highly unlikely to occur if an environmental approval has been granted for a generation activities in the absence of conditions. The failure to impose conditions related to emissions in the approval process diminishes the effectiveness of offence provisions in giving effect to the polluter pays principle which should inform the state legislation.

6.3.3 Impact of transitional assistance for coal-fired generators

Transitional assistance was provided to coal-fired electricity generators in the form of cash payments in 2012 and free carbon units to be issued in the years beginning 1 July 2013, 2014, 2015 and 2016.

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217 Energy Efficiency Opportunities Act 2006 (Cth) ss 9, 10.

218 Ibid pts 6, 7.

219 It is implemented through the Renewable Energy (Electricity) Act 2000 (Cth); Renewable Energy (Electricity) Regulations 2001 (Cth); Renewable Energy (Electricity) (Charge) Act 2000 (Cth).

220 Environment Protection Act 1997 (ACT) s 142 (placing pollutant where it could cause harm, but only if the pollutant is prescribed or exceeds the prescribed measure: s 5); Protection of the Environment Operations Act 1997 (NSW) s 95; Environmental Protection Act 1993 (SA) s 25; Environmental Management and Pollution Control Act 1994 (Tas) s 51A; Environment Protection Act 1970 (Vic) s 41; Environmental Protection Act 1986 (WA) s 49; Protection of the Environment Operations Act 1997 (NSW) s 115(1); Environmental Protection Act 1994 (Qld) s 443; Environment Protection Act 1970 (Vic) s 40; Environmental Protection Act 1986 (WA) ss 49A, 50, 51. The Environmental Protection Act 1994 (Qld) also makes it an offence to release a ‘prescribed contaminant’ (s 442), but greenhouse gas emissions are not a prescribed contaminant.

221 See for example Gray v Macquarie Generation [2010] NSWLEC 34.

222 See Internegovernmental Agreement on the Environment, above n 35, s 3.5.4.

223 Cash payments were made in June 2012: Commonwealth Department of Climate Change and Energy Efficiency, Energy Security Fund Cash Payments: Guidelines for Applications for a Certificate of Eligibility for Coal-Fired Generation Assistance (Cash Payments) (Commonwealth of Australia, 2012), 6 <http://www.climatechange.gov.au/government/initiatives/~/media/government/initiatives/esf-cp/energy-security-fund-cash-payments-guidelines-pd.pdf>; Explanatory Memorandum, Clean Energy Bill 2011 (Cth) 182. In the financial years beginning 1 July 2013, 2015 and 2016, 41.705 million free carbon units will be issued per year. The total number of units allocated in the 2014–15 financial year may differ from this number and is calculated according to a different formula which ensures that no more than 83.41 million free carbon units can be issued over the first two years of allocations: Clean Energy Act 2011 (Cth) s 161; Explanatory Memorandum, Clean Energy Bill 2011 (Cth) 194, 197.
A generation complex must meet certain eligibility requirements for transitional assistance. It must be emissions-intensive and exposed to significant competition from lower-emissions electricity generation, and must also pass a ‘power system reliability test’ certifying that it will continue to provide a certain level of generation capacity. This test may act as a perverse incentive for a generation complex to continue in full operation, instead of reducing generation capacity, in order to receive transitional assistance. A generation complex must also submit a clean energy investment plan which ‘sets out’ plans for reducing emissions intensity, installing CCS technology and investing in clean energy. The flaw in this requirement is that there is no substantive obligation imposed to actually implement these plans.

The conclusion of the research is that the provision of transitional assistance will undermine the operation of the carbon pricing mechanism. It will partially shield the coal-fired electricity sector from the impact of the carbon price. Provision of free carbon units to emitters will also reduce demand for carbon units once the emissions trading scheme commences, lowering the market price of carbon. Additionally, coal-fired electricity generators that receive free carbon units may choose to pass the ‘carbon costs’ onto retailers and/or consumers of electricity. This may result in windfall profits for coal-fired electricity generators that receive transitional assistance.

The provision of transitional assistance conflicts with the principles of ESD, in particular the ‘polluter pays’ principle. The assistance is benefitting large emitters of greenhouse gases economically, but fails to impose clear obligations in return for assistance such as reducing emissions through CCS technology, changing to clean energy technology or compensating the community for the impact of emissions. The Government’s justifications for transitional assistance includes maintenance of energy security, supporting investor confidence and compensation to coal-fired electricity generators for loss of asset value. These justifications are either unpersuasive or addressed through other means, including the introduction of an Energy Security Council and provision of transitional loan assistance to coal-fired electricity generators.

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226 Clean Energy Act 2011 (Cth) s 177.
227 See Christoff, above n 195.
231 Clean Energy Act 2011 (Cth) s 159.
232 See Caripis et al, above n 211.
6.4 Conclusions and Recommended Reform

Reducing Australia’s reliance upon coal-fired electricity generation is a significant challenge for reducing greenhouse gas emissions. The carbon pricing mechanism alone will not achieve significant reduction of emissions from coal-fired electricity generation before 2020. Features of the carbon pricing mechanism such as legislative constraints on the carbon price, an ability to exceed the carbon pollution cap through surrender of international emissions units, and provision of transitional assistance will detract from its effectiveness in reducing emissions from coal-fired electricity generation. The carbon pricing mechanism alone is unlikely to constitute a legal instrument that will drive significant and rapid emissions reductions from the coal-fired electricity sector. A portfolio of legal instruments will be required to encourage behavioural change from the coal-fired electricity sector, increase the market share of low-emissions and renewable electricity generation, and ensure significant emissions reductions. These instruments should complement the carbon pricing mechanism.

- Energy efficiency requirements for coal-fired electricity generation should be retained.
- Direct regulation such as feed-in tariff schemes and the large-scale renewable energy target should be retained.
- A prohibition on new coal-fired electricity generation should ideally be imposed but this may not be politically feasible.
- Emissions from new coal-fired electricity generation should be regulated through the imposition of nationally consistent, mandatory conditions of approval requiring:
  (a) an emissions intensity standard of 0.80 or below; and
  (b) installation of CCS-ready equipment.
- These conditions of approval are necessary because the carbon pricing mechanism will not directly affect either the emissions intensity of a new coal-fired generation complex or its use of carbon capture and storage technology. Conditions should be framed in a manner that is complementary to the operation of the carbon pricing mechanism.
- Measures such as the renewable energy target and conditions of approval for reduction and mitigation of emissions from new coal-fired electricity generation will be necessary as transitional support for the carbon pricing mechanism. Once the carbon price rises high enough to facilitate a widespread shift away from coal-fired electricity generation these instruments should be abolished.
7. Legislative Case Study Three – Carbon Capture and Storage

7.1 Overview Case Study Three

Geological sequestration of carbon is more commonly known as carbon capture and storage, or ‘CCS’. CCS involves the capture of carbon emissions from fossil fuel-fired electricity generation or other industrial processes, followed by transport of the emissions and injection for permanent storage into an underground storage formation. CCS removes and stores carbon dioxide that would otherwise be emitted into the atmosphere and is regarded as a key measure for the reduction of greenhouse gas emissions. This technology has the potential to assist in achieving national emissions reduction targets but there are currently no large-scale integrated (integrating capture, transport and storage) CCS projects operational in Australia. There are a number of factors impacting on the commercial implementation of CCS technology and that are relevant to the operation of the legal framework.

First the process is very expensive. Although costs will vary depending on the project characteristics, current cost estimates range from $16 to $151 per tonne of carbon dioxide stored on the East Coast of Australia, and from $10 to $4,400 per tonne of carbon dioxide stored on the West Coast. In order for a project to be financially and commercially viable, the capital and operational costs of CCS must be less than the carbon price. Otherwise, an emitter will presumably take the cheaper option of emitting carbon dioxide into the atmosphere and paying the carbon price.

Secondly, CCS projects also carry a number of risks. The main risks arise from leakage of carbon dioxide during the injection and storage phases of the project. Carbon dioxide could potentially migrate into linked underground saline reservoirs, unlinked underground reservoirs (through faults or fractures) including groundwater reservoirs, adjacent mineral or hydrocarbon reserves or onto the land surface. Leakage of stored carbon dioxide could result in changes to subsurface pressure leading to induced seismic activity, contamination of groundwater, impacts upon natural resources such as forests or vegetation through escape to the surface, and loss or damage to adjacent mineral, oil or gas reserves. The Intergovernmental Panel on Climate Change states that the fraction of carbon dioxide retained in an appropriately selected and managed storage formation is “very likely” to exceed 99%.

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234 Material in this case study was originally published in the following source and reproduced with the permission of the publisher: Nicola Swayne and Angela Phillips, ‘Legal Liability for Carbon Capture and Storage in Australia: Where should the losses fall?’ (2012) 29 Environmental and Planning Law Journal 1.
over 100 years and “likely” to exceed 99% over 1000 years. However, there is a great deal still to be learnt about the risks of CCS and current risk modelling has a number of limitations.

The legal framework regulating the use of carbon capture and storage for mitigation of emissions therefore needs to carefully balance the cost of implementing a CCS project with the potential environmental benefits and scientific uncertainties and social impact of environmental harm. The proper integration of ESD principles is crucial at the approval stage and throughout the life of the project.

The focus of the case study is the management of risks of environmental harm from CCS projects, and the allocation of responsibility for environmental harm if it does occur. The key aspects considered in the case study are:

(i) the extent to which ESD principles are integrated within the decision making process to approve a CCS project;
(ii) whether the approach taken to managing the risk of environmental harm is consistent with ESD principles;
(iii) the effectiveness of the legislative framework in allocating responsibility for avoiding or remediating environmental harm.

7.2 Overview of legal regime for carbon capture and storage

CCS is a novel technology requiring significant capital investment by project proponents. The legal regime must encourage private industry investment for CCS projects while managing the novel risks of projects to protect the public and private interest. The Commonwealth, Victorian, Queensland, South Australian and Western Australian Governments have enacted legislation regulating onshore and offshore CCS projects. The scope of this case study will however be restricted to the Commonwealth, Queensland and Victorian legislation as jurisdictions in which commercial projects are likely to occur. The Gorgon project in WA is due to commence operation in 2015. This project is an offshore gas development project which will be regulated under the Commonwealth regime. The Victorian CarbonNet project, Western Australian South West Hub project and Queensland Surat Basin project are currently under evaluation. These projects are undertaking modelling and testing of potential storage sites, acquiring data, and undergoing restructuring. Finally, the Callide Oxyfuel Project in Queensland is an integrated demonstration project on a smaller scale. It aims to capture carbon emissions by retrofitting capture technology onto an existing coal-fired power station, and then transport and store the emissions. This project has commenced capture of emissions, but the final storage site has not yet been determined.

The legal framework for approval and management of geological sequestration activities is similar to existing statutory frameworks for regulation of mining and petroleum activities. A project proponent

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239 Intergovernmental Panel on Climate Change, Special Report on Carbon Dioxide and Storage: Summary for policy makers and technical summary (Intergovernmental Panel on Climate Change, 2005) 14.
must obtain an exploration or assessment permit to explore an area for its viability for geological sequestration. The proponent may then apply for an injection lease or licence which will confer rights to inject and store carbon dioxide. State environmental approval will also need to be obtained for a geological sequestration project, including the process of environmental impact assessment. Federal environmental approval under the Environment Protection and Biodiversity Conservation Act (Cth) will be required where a proposed project will have impacts on a matter of national environmental significance.

Once an injection lease or licence is granted, injection and storage of carbon dioxide generally must commence within 5 years, failing which the licence may be revoked. A project proponent must comply with the approved injection and monitoring plan, reporting requirements imposed by the legislation, and any directions issued by the Minister. When injection and storage of carbon dioxide has ceased the project proponent may commence the site closure process. The Government will assume responsibility for monitoring the project site upon completion of the site closure process. However, the issue of long-term liability for leakage of carbon dioxide is not comprehensively addressed in any jurisdiction.

7.3 Approval process for CCS projects

The approval process for CCS projects is similar across jurisdictions. The holder of a greenhouse gas assessment or exploration tenement may apply for an injection and storage tenement. An injection and storage tenement will generally only be granted where an appropriate underground storage formation exists within the tenement area. Commonwealth and offshore Victoria legislation specifically requires that the Minister make a declaration of an ‘identified greenhouse gas storage formation’. This declaration will set out matters such as the particular amount suitable to be injected in the formation, the particular greenhouse gas substance suitable to be injected in the formation, the particular or points at which injection is suitable, the period of time over which injection is suitable, the effective sealing feature, attribute or mechanism that enables the permanent storage, and the engineering enhancements necessary (if any) to enable permanent storage (‘fundamental suitability determinants’). The holder of a greenhouse gas injection licence must

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244 Greenhouse Gas Storage Act 2009 (Qld) ch 2; Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic) ch 3, pt 3.2.
246 See above n 44.
254 Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth) ss 21(1),(8); Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic) ss 23(1),(8).
conduct operations in accordance with the specified fundamental suitability determinants. In other jurisdictions the requirement for suitability is less explicit although the application documents or site plans must outline similar matters.

All jurisdictions set out matters which the Minister must take into consideration when deciding whether to grant a greenhouse gas injection licence. The Victorian onshore legislation requires the Minister to consider the merits of the proposed work program, the suitability of the underground formation for storage, and the likelihood of permanent containment of the greenhouse gas substance. Queensland legislation requires the Minister to consider, inter alia, whether an environmental authority has been issued and whether the applicant has entered into a commercial arrangement for greenhouse gas stream storage in the greenhouse gas lease’s area. Commonwealth and offshore Victoria legislation requires consideration of whether injection will commence within 5 years and the draft site plan is adequate, and whether there is a significant risk that greenhouse gas injections and storage operations will have a significant adverse impact on petroleum exploration or recovery operations. All jurisdictions require consideration of whether the applicant has the necessary financial and technical resources and ability to carry out greenhouse gas stream storage.

Impacts on surrounding land and water resources from CCS projects are generally not considered as part of the decision-making process, although there may be a requirement to consider and address these impacts as part of the site plan or injection and monitoring plan. The main emphasis of CCS frameworks is addressing the impacts of greenhouse gas sequestration operations upon surrounding resources such as petroleum. There is also a requirement for proponents of onshore projects conducted upon private land to enter into compensation agreements with the landowner(s). The principles of sustainable development are not explicitly integrated into approval processes for CCS projects. The threat of serious or irreversible environmental harm from a large-scale leakage of carbon dioxide from a CCS project would appear to activate the precautionary principle. Onshore and offshore Victorian legislation states that regard should be given to the principles of sustainable development, including the precautionary principle, in administering the legislation. However the approval processes and operational requirements in the legislation do not require specific consideration or application of the precautionary principle.

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256 Greenhouse Gas Storage Act 2009 (Qld) ss 141, 142; Greenhouse Gas Geological Sequestration Act 2008 (Vic) s 73.
257 Greenhouse Gas Geological Sequestration Act 2008 (Vic) s 82.
258 Greenhouse Gas Storage Act 2009 (Qld) ss 117, 118.
263 Greenhouse Gas Geological Sequestration Act 2008 (Vic) ss 200, 201; Greenhouse Gas Storage Act 2009 (Qld) ch 5, pts 7, 10.

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Managing the risk of environmental harm

The approval process focuses primarily upon the viability of the project, suitability of the storage formation and potential risks to surrounding resources. Risks of environmental harm are left to be managed throughout the operational stage of a CCS project. The legislation appears to take an adaptive management approach through the use of Ministerial powers to respond and adjust the operation of the project.

Operational phase of carbon capture and storage projects

All CCS legislation provides for the grant of a greenhouse gas storage lease or licence. Rights to inject and store carbon dioxide are subject to ministerial powers to intervene in the carrying out of CCS projects. The relevant Minister may issue directions relating to the composition and origins of the injected carbon dioxide and the volume and rate of injection. There are also a broad range of ministerial powers to issue directions where a ‘serious situation’ exists in relation to the project. ‘Serious situation’ is widely defined and may include where carbon dioxide injected into the underground storage formation has leaked, there is a significant risk that it will leak in the course of being injected, or the carbon dioxide being injected is behaving otherwise than as predicted. Once a ‘serious situation’ is triggered, the Minister can issue directions requiring the proponent to carry out the injection of carbon dioxide in a particular manner or to cease or suspend the injection of carbon dioxide. Additional notices and directions may be issued, such as orders to rehabilitate the environment. Overall there is a high risk of ministerial intervention into the carrying out of CCS projects to address risks of environmental harm.

Closure of carbon capture and storage projects

Risks of environmental harm from leakage of carbon dioxide will continue once injection of carbon dioxide has ceased. CCS legislation attempts to manage these risks through the site closure process. Once this process has been completed by a CCS project proponent, long-term responsibilities for monitoring and verification of the project will be handed over to the State. CCS legislation imposes a number of pre-requisites for site closure and handover of responsibility. Generally, the project proponent must apply for a ‘site closing certificate’ or surrender of the lease or licence. At this stage the Minister may issue site closing directions requiring the proponent to carry out specified actions to reduce the risks of long-term storage.

An application for site closure will only be approved once the Minister is satisfied that the injected carbon dioxide is behaving as predicted and the risks associated with permanent storage have been

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265 Although environmental impacts from the project will be considered and addressed through the process for grant of an environmental or planning approval.
266 For example, the Queensland government states that there is an adaptive environmental management system in place for greenhouse gas storage projects: Queensland Government Department of Environment and Heritage Protection, Adaptive Management, above n 87.
reduced as much as is reasonably practicable. These discretionary thresholds will create uncertainty for the project proponent who will be unable to predict when they will be able to surrender their lease or licence and hand over responsibility for the project site. A project proponent may also be required to pay additional sums of money to cover long-term monitoring and verification of the project before site closure is approved.

7.5 Responsibility for environmental harm

Environmental harm from CCS projects may lead to common law or statutory liability for the project proponent or other parties such as the Crown. CCS legislation sets out responsibility for environmental harm to some extent but there is still significant uncertainty surrounding this matter.

The risks of leakage during the injection and storage phases of a CCS project present a number of potential liabilities for the proponent. First, tortious liabilities may arise in the form of actions brought against the proponent for trespass, nuisance or negligence. The specific elements of trespass and nuisance actions will be exceedingly difficult to prove in the context of leakage from a CCS project. An action for negligence could also be brought against the project proponent where leakage from a CCS project causes damage to a third party. However, the establishment of a reasonable standard of care for a novel CCS project will be a challenging task. It may also be difficult to prove that carbon dioxide leakage from the storage formation has caused the specific damage alleged by the third party.

The potential liabilities arising from leakage from a CCS project are further complicated by:

i. Ministerial powers to intervene in the carrying out of a project, including directions to change the volume or rate at which carbon dioxide is injected; and
ii. uncertainty surrounding ownership of carbon dioxide during injection and storage of the gas.

The exercise of Ministerial powers of intervention will increase the difficulty of determining causation where a project proponent is faced with allegations of negligence. Some CCS legislation contains limited statutory protections from liability for a project proponent who is acting under a direction issued by the Minister.

Furthermore, ownership of the storage formation, sequestered gas and associated infrastructure are likely to be a starting point for determining legal responsibility for any harm caused by leakage of carbon dioxide. Ownership of these components of a CCS project is only partially addressed in the

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274 Greenhouse Gas Geological Sequestration Act 2008 (Vic) s 174(1); Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth) s 391; Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic) s 426; Environmental Protection Act 1994 (Qld) s 311T.


276 See for example Chance v BP Chemicals Inc 77 Ohio St 3d (1996) 24-27.


legislation. Potential owners of these components are the project proponent, the landowner (if the project is conducted on private land) or the Crown (if the project is conducted on public land). CCS frameworks do not take a consistent approach to addressing ownership of the storage formation, sequestered gas or associated infrastructure. Queensland legislation sets out ownership of project infrastructure throughout the life of the project while all other jurisdictions are silent on this matter.\textsuperscript{281} In all jurisdictions except for the Commonwealth, ownership of the storage formation is vested in the Crown throughout the life of the project.\textsuperscript{282} Commonwealth legislation does not address ownership of the storage formation. Finally, all jurisdictions are silent on ownership of the sequestered gas during the injection and storage phases of a CCS project. Upon site closure and surrender of the relevant lease or licence, the Crown is vested with ownership of the sequestered gas in Victoria and Queensland while the Commonwealth legislation remains silent.\textsuperscript{283} Failure to specify ownership of the sequestered gas through legislation may lead to application of the common law principles regarding fixtures and chattels.\textsuperscript{284} It is impossible to come to a satisfactory conclusion upon ownership of sequestered gas through an application of these principles.

Although a project proponent is likely to be at least partially responsible for environmental harm occurring during the operational stages of a CCS project, the extent and scope of a proponent’s long-term liability is unclear. All jurisdictions take a different legislative approach to a project proponent’s long-term liability after the site closure process has been completed. The Commonwealth legislation states that a ‘closure assurance period’ can be declared 15 years after the site closing certificate has been issued providing that the sequestered carbon dioxide is behaving as predicted.\textsuperscript{285} Once this closure assurance period has been declared, the Commonwealth will provide an indemnity for damages to the project proponent. This indemnity extends to a liability of the current or former project proponent (holder of the injection licence), incurred or accrued after the closure assurance period has been declared, which is attributable to an act or omission that occurred during the carrying out of authorised activities for the CCS project.\textsuperscript{286} The legislation does not specify a test of causation that will apply to determine whether the liability is ‘attributable’ to a particular act or omission. In circumstances where the project proponent has ceased to exist, liability will attach to the Commonwealth instead provided that the above conditions are satisfied.\textsuperscript{287}

Legislation in all other jurisdictions is silent on the issue of long-term liability. In Queensland, it is noted that ‘the issue of long-term liability remains complex’ while the Victorian government has stated that common law liability remains with the proponent.\textsuperscript{288} This is problematic due to significant concerns of private entities that long-term liability will be retained by the project proponent rather than being transferred to the Crown.\textsuperscript{289}

\begin{thebibliography}{99}
\bibitem{GreenhouseGasStorageAct2009Qld} Greenhouse Gas Storage Act 2009 (Qld) ss 250-252, 269, 326, 327.
\bibitem{NSWCommissionerOfStampDuties} See North Shore Gas Co Ltd v Commissioner of Stamp Duties (NSW) (1940) 63 CLR 52; Holland v Hodgson (1872) LR 7 CP 328.
\bibitem{Ibid} Ibid s 400.
\bibitem{Ibid2} Ibid s 401.
\bibitem{Haszeldine} Haszeldine, above n 238, 18.
\end{thebibliography}
Overall a project proponent is faced with significant uncertainty surrounding the scope and extent of their responsibility for environmental harm. Site closure thresholds are largely dependent upon the discretion of the Minister and the scope of a project proponent’s long-term liability following site closure is unclear. The differing liability rules presented across the jurisdictions will create unnecessary legal uncertainty and higher transaction costs and ultimately act as a barrier to the commercial deployment of CCS technology. Furthermore, the application of the ‘polluter pays’ principle would appear to require that the project proponent remains responsible for any environmental harm caused by the leakage of carbon dioxide. This is not clear from the legislation as it currently stands.

7.5.1 Responsibility for carbon dioxide leakage under the carbon pricing mechanism

Liable entities under the carbon pricing mechanism can reduce their liability by transferring emissions for permanent storage using CCS. Estimates of emissions under the National Greenhouse and Energy Reporting Act 2007 (Cth) can be reduced by the amount of carbon dioxide captured and transferred to a project proponent for permanent storage. The project proponent will issue a certificate to the liable entity specifying the amount of carbon dioxide transferred for permanent storage.

However, there are no legal implications under the National Greenhouse and Energy Reporting Act 2007 (Cth) or the Clean Energy Act 2011 (Cth) if there is subsequent leakage of carbon dioxide from a CCS project. Emissions are not accounted for under either Act unless there are ministerial methods or criteria by which the emissions are to be measured. Current ministerial determinations for CCS projects extend only to the measurement of fugitive emissions from the transport of carbon dioxide captured for permanent storage. Additionally, requirements to account for emissions under the National Greenhouse and Energy Reporting Act 2007 (Cth) or the Clean Energy Act 2011 (Cth) will only arise if emissions from a particular source amount to 25,000 tonnes of carbon dioxide or more annually. This will not cover insidious leaks from CCS projects that do not meet the 25,000 tonnes per annum threshold.

The current legislation creates an environment where a liable entity is able to reduce their liability under the carbon pricing mechanism by transferring their emissions for permanent storage without any equivalent responsibility being placed upon the project proponent for any losses of those emissions. This is a fragmented and counterproductive approach which effectively does not require permanent storage of carbon dioxide once transferred and injected.

7.6 Conclusions and Recommendations

Legal frameworks for CCS must meet the environmental objective of ensuring permanent storage of carbon dioxide and avoiding harm from leakage. Economic considerations are also relevant due to the projected initial costs of CCS operations and the potential costs that may arise from a project proponent’s long-term liability for the sequestered carbon dioxide. The legal regime must integrate

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290 Klass and Wilson, above n 278, 123.
291 National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Cth) s 1.19B. Carbon dioxide is captured for permanent storage only if it is captured by, or transferred to the holder of a greenhouse gas injection licence/lease or approval under the Commonwealth, State or Territory CCS legislation: National Greenhouse and Energy Reporting (Measurement) Determination 2008 (NGER Determination 2008) s 1.19A.
292 Ibid s 1.19B.
293 National Greenhouse and Energy Reporting Act 2007 (Cth) ss 10, 13; Clean Energy Act 2011 (Cth) s 30(1).
both environmental and economic considerations by providing a clear framework for the allocation of responsibility for environmental harm. Current legal frameworks for CCS could incorporate the following proposals for reform:

- Legislation in all jurisdictions should set out ownership of the storage formation, sequestered gas and associated infrastructure during the injection, storage and post-site closure stages of a CCS project.
- The treatment of long-term liability for CCS projects should be clarified and consistent across jurisdictions. The transfer of responsibility to the Crown after site closure should be comprehensively set out, including the nature of liability to be transferred, the scope of any indemnities provided and the timing for the provision of any legal protections. Consideration should be given to application of the ‘polluter pays’ principle.
- Proper accountabilities under the carbon pricing mechanism should be placed upon all leakages from CCS projects within Australia.
8. Legislative Case Study Four – Biological Sequestration

8.1 Overview Case Study Four*296

Biosequestration is the process whereby plants sequester carbon from the atmosphere and store it in trees, vegetation and the subsurface including roots and soil. Biosequestration reduces the amount of carbon dioxide in the atmosphere and is therefore an important method for the reduction of greenhouse gases and mitigation of climate change.297 Until recently, Australia’s approach to biosequestration was to restrict or prohibit vegetation clearing so as to increase absorption of carbon by maintaining vegetation.298 There has been a move away from prescriptive regulation to an approach that provides financial incentives for landowners and investors to undertake biosequestration activities.299 The cornerstone of this approach is the federal Carbon Farming Initiative, which is an incentive-based scheme for biosequestration projects. The Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) (‘CFI Act’) allows landowners and investors to gain tradeable carbon offset credits called Australian Carbon Credit Units (‘ACCUs’) by undertaking ‘eligible offsets projects’. These are projects that sequester carbon from the atmosphere and store it in living biomass, dead organic matter or soil (‘sequestration offsets projects’) or that reduce emissions at source in relation to agriculture and other specified activities (‘emissions avoidance offsets projects’).300 The CFI Act provides a framework for the establishment of eligible offsets projects at a national level, but relies upon State legislation for the creation of a valid interest in land to support the project and allows for the surrender of ACCUs under the Commonwealth carbon pricing mechanism.

Unlike the process of geological sequestration examined in case study 3, biosequestration does not present the same environmental risks to surrounding land, air or water and therefore, does not require the same regulatory safeguards for managing environmental harm. A more significant issue is the impact of environmental hazards on the sustainability of the sequestered carbon pool and the consequences of disturbance or destruction on the integrity of ACCUs issued for the project. Therefore, while the effectiveness of the CFI scheme is also dependent upon the integration of economic, environmental and social considerations within the regulatory framework, the focus of these considerations is on protection of an offsets project from environmental impacts and human intervention, rather than minimising the environmental harm caused by the project.


298 See, for example, Vegetation Management Act 1999 (Qld) pt 2; Native Vegetation Act 2003 (NSW) pts 3, 4; Native Vegetation Act 1991 (SA) pt 5; Environmental Protection Act 1986 (WA) pt V, div 2. See also Justine Bell, ‘Tree Clearing, Hunger Strikes, and the Kyoto Protocol: The need for a middle ground’ (2011) 28 Environmental and Planning Law Journal 201, 204.


300 Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) ss 53, 54.
The regulatory framework governing biosequestration must integrate the economic consideration of providing incentives for the uptake of projects, and the environmental, economic and social considerations of ensuring permanent, measureable and verifiable emissions reductions to underpin the market for ACCUs. Several key aspects underpin the legislative framework:

(i) The decision-making process for approval of a project under the CFI Act;
(ii) The security of an interest in land for the project proponent to ensure the benefits of the project can continue for at least 100 years;
(iii) Enforcement toolkit for the regulator to ensure compliance by the project proponent and maintenance of the carbon pool for at least 100 years;
(iv) Strict requirements for measuring and calculating sequestered carbon for the issue of ACCUs.

This case study examines the extent to which environmental, social and economic considerations are integrated into each of the key aspects of the regulatory framework and whether they contribute to a sustainable regime.

8.2 Australian legal framework for biosequestration

The legal framework regulating biosequestration offsets projects is comprised of the CFI Act, the *Carbon Credits (Carbon Farming Initiative) Regulations 2011* (Cth), and any applicable methodology determination for the project. The Carbon Farming Initiative is administered by the Clean Energy Regulator who will approve biosequestration offsets projects, issue ACCUs for the project and undertake compliance action when necessary.

The Clean Energy Regulator may issue one ACCU to the project proponent for each tonne of carbon dioxide sequestered by an eligible offsets project. ACCUs issued under the Carbon Farming Initiative are divided into ‘Kyoto ACCUs’ and ‘non-Kyoto ACCUs’. Biosequestration offsets projects undertaking activities that count towards Australia’s emissions reductions targets under the Kyoto Protocol can be issued with Kyoto ACCUs, while project undertaking other types of activities will be issued with non-Kyoto ACCUs. Kyoto-approved biosequestration activities include reforestation and avoided deforestation. Other biosequestration activities such as soil carbon, improved forest management and non-forest revegetation are not currently recognised under the Kyoto Protocol. Due to the status of international negotiations under the Kyoto Protocol, ACCUs issued for biosequestration offsets projects undertaking Kyoto-approved activities are known as ‘non-Kyoto (eligible) ACCUs’ from 1 January 2013.

301 Current methodology determinations for biosequestration projects are: *Carbon Farming (Quantifying Carbon Sequestration by Permanent Environmental Plantings of Native Tree Species using the CFI Reforestation Modelling Tool) Methodology Determination 2012* (Cth); *Carbon Credits (Carbon Farming Initiative) (Reforestation and Afforestation) Methodology Determination 2013* (Cth); *Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even-Aged Native Forest) Methodology Determination 2013* (Cth); *Carbon Credits (Carbon Farming Initiative) (Quantifying Carbon Sequestration by Permanent Mallee Plantings using the Reforestation Modelling Tool) Methodology Determination 2013* (Cth).
302 *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) ss 16-18.
303 Ibid ss 11, 55.
304 Ibid ss 53, 54.
Kyoto ACCUs and non-Kyoto (eligible) ACCUs can be surrendered under the carbon pricing mechanism by a liable entity. Each ACCU surrendered by a liable entity represents one tonne of carbon sequestered or avoided that will offsets one tonne of carbon emitted by the liable entity. Hence, instead of reducing its emissions by a certain amount, a liable entity may choose to acquire and surrender ACCUs representing that amount. In the first three years of the carbon pricing mechanism, ACCUs cannot exceed five per cent of the units surrendered by a liable entity. Upon transition to an emissions trading scheme on 1 July 2015, there are no restrictions on the amount of ACCUs that can be surrendered by a liable entity.

A biosequestration offsets project will commence and operate in the following manner. First, the project proponent must apply to the Clean Energy Regulator for approval of a proposed biosequestration offsets project. There are a number of requirements which must be satisfied before approval will be granted, and other approvals for the project may be required under state or federal planning, environmental or water legislation. The proponent for a biosequestration offsets project must also hold the ‘applicable carbon sequestration right’ over the project area. The applicable carbon sequestration right is obtained under state laws. Each state in Australia has legislated to create property rights over carbon sequestered in trees, forests and vegetation (‘carbon sequestration rights’). These rights are used to support the marketability of biosequestration offsets projects by securing permanence of emissions reductions and clarifying ownership of sequestered carbon.

Once approved, a biosequestration offsets project must be conducted in accordance with a methodology determination. Each methodology determination sets out eligibility and operational requirements for a particular type of project. The project proponent must comply with ongoing monitoring and reporting obligations to ensure that real, verifiable and credible emissions reductions are occurring under the project. Monitoring, inspecting and auditing powers are also granted to the Clean Energy Regulator.

The CFI Act aims to ensure compliance through imposition of penalties or sanctions upon a project proponent. First, penalties may be imposed for non-compliance with the legislation. Second, in the case of a sequestration offsets project, regulatory sanctions may be imposed where there has been reversal of carbon sequestration. The project proponent can be required to relinquish a number of ACCUs, failing which a non-compliance penalty will be payable. A carbon maintenance obligation may be placed over the project area as a final measure. These regulatory sanctions are explained in more detail below.

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307 Clean Energy Act 2011 (Cth) s 5.
308 Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) s 27.
310 Forestry Act 1959 (Qld) ss 61K, 61M, Land Title Act 1994 (Qld) s 97N; Conveyancing Act 1919 (NSW) s 87A; Carbon Rights Act 2003 (WA) s 8(1); Forest Property Act 2000 (SA) ss 3A, 5; Forestry Rights (Registration) Act 1990 (Tas) s 3; Climate Change Act 2010 (Vic) s 22.
312 Ibid pt 9.
314 Ibid pts 18, 19.
8.3 Approval of CFI offsets project

The CFI Act provides a rigorous assessment framework for approval of biosequestration offsets projects. A biosequestration offsets project must be declared an ‘eligible offsets project’ by the Clean Energy Regulator. There are a number of requirements for this declaration. First, the project must be conducted under a ‘methodology determination’ and comply with its requirements. A methodology determination is a legislative instrument setting out eligibility and operational requirements for each type of offsets project. For example, there are currently methodology determinations that have been approved for environmental plantings, reforestation and afforestation and human-induced regeneration of a permanent even-aged native forest.316

Methodology determinations must be endorsed by the Domestic Offsets Integrity Committee and comply with the Offsets Integrity Standards set out in the CFI Act. The Standards require emissions reductions to meet a specified test of additionality, be measured and capable of verification, and, with respect to sequestration projects, provide for adjustments in cyclical levels of sequestration across a one-hundred-year period.317 The ‘additionality’ test is aimed at ensuring projects will provide emissions reductions that are additional to those which would have occurred without the project. The test has two parts: the project is not already required under another law, and the project is on the ‘positive’ list in the Carbon Farming Regulations. The positive list contains projects that are deemed to be additional.318 When considering activities for inclusion in the positive list, the Minister must have regard to the advice of the Domestic Offsets Integrity Committee and consider whether the project is ‘not common practice’ in the relevant industry or environment.319

Second, the project proponent must meet a number of criteria before a declaration of an eligible offsets projects can be made. The project proponent must pass the ‘fit and proper person’ test including whether he or she has previously breached any relevant legislation.320 The project proponent must also obtain the legal right to carry out the project and be the registered owner of the ‘applicable carbon sequestration right’ over the project area.321 All holders of an eligible interest in the project land (such as holders of a mortgage or lease) must consent to the project being carried out on their land.322

Finally, the proposed project must not be an excluded offsets project.323 This requirement appears to be aimed at balancing the benefits of the project in reducing or sequestering emissions with other environmental and social impacts of the project.324 The Regulations contain a list of excluded offsets projects. Projects are excluded on the basis of whether there is a material risk that the project will have a material adverse environmental impact on water availability, biodiversity or land access for agricultural production, or material adverse social impact on employment or the local community.325

316 See above n 301.
318 Carbon Credits (Carbon Farming Initiative) Regulations 2011 (Cth) reg 3.28.
319 Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) s 41.
320 Ibid ss 27(4)(f), 64.
321 Ibid ss 5, 27(4)(e).
322 Ibid ss 27(4)(k), 44-45A.
323 Ibid s 56.
324 Explanatory Memorandum, Carbon Credits (Carbon Farming Initiative) Bill 2011 (Cth) 1.26-1.33.
Once all of the abovementioned requirements are fulfilled, a declaration of an eligible offsets project will be made and the project can commence operation. Other regulatory approvals are likely to be necessary for the project under state and federal environmental, planning and water legislation. The CFI Act acknowledges this and states that a declaration of an eligible offsets project may be made conditional upon all regulatory approvals being obtained for the project before the end of the first reporting period.326

8.4 Offsets project secured by interest in land

A biosequestration offsets project must sequester carbon in the project area for a minimum of one hundred years.327 The security of an interest in land will be required to meet this timeframe. Consequently, the CFI Act requires the project proponent to hold an ‘applicable carbon sequestration right’ over the project area. This is defined as a registered or recorded estate, interest or right that confers ‘the exclusive legal right to obtain the benefit (whether present or future) of sequestration of carbon in the relevant carbon pool on the area of land’ and runs with the land.328 The requirement to hold an applicable carbon sequestration right attempts to take account of the economic consideration that viability of the project requires long-term land tenure, and the environmental consideration that security of tenure will contribute to the longevity of carbon sequestration.

An applicable carbon sequestration right will be obtained under state laws. Each Australian state has introduced legislation to create a property right over sequestered carbon in trees, forests and vegetation.329 These rights are separate from ownership of the land and ownership of the trees, forests or vegetation upon the land. They will be referred to collectively as ‘carbon sequestration rights’.

Most state carbon sequestration legislation was enacted prior to the introduction of the Carbon Farming Initiative, but a state carbon sequestration right will be used to underpin a biosequestration offsets project. Although state carbon sequestration rights are all specified in slightly different terms to the Commonwealth definition, it appears that these rights will be sufficient to meet the requirements of the CFI Act.330

A carbon sequestration right is an interest in land331 but its incidents are not fully established. State legislation generally provides that a carbon sequestration right confers ‘the right to the economic benefit of carbon sequestration’ which will allow the holder of the right to claim ACCUs for the sequestered carbon. No other incidents of a carbon sequestration right are specified in legislation. However, there will generally be an agreement underpinning the sale of carbon sequestration rights to a project proponent that sets out the incidents of the right (‘carbon sequestration agreement’).

326 Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) s 28.
327 Ibid s 87.
328 Ibid s 43.
329 See Conveyancing Act 1919 (NSW) ss 87A, 88AB; Forestry Act 1959 (Qld) pt 6 and Land Title Act 1994 (Qld) pt 6, div 4C; Forest Property Act 2000 (SA) s 5; Forestry Rights Registration Act 1990 (Tas) ss 3, 5; Climate Change Act 2010 (Vic) ss 20-25; Carbon Rights Act 2003 (WA) ss 3, 5, 6.
331 This is not explicitly specified in South Australia where a carbon sequestration right is deemed to be a profit à prendre for the purposes of transactions conducted under the relevant land titles legislation: Forest Property Act 2000 (SA) s 12. However a profit à prendre is an interest in land.
A carbon sequestration agreement is specifically authorised by legislation in Victoria, New South Wales, Western Australia and Tasmania. All four States distinguish between a carbon sequestration right and the associated carbon sequestration agreement. Queensland and South Australian legislation do not make this distinction. In South Australia, the carbon sequestration agreement itself constitutes the carbon sequestration right. There is no statutory provision for a carbon sequestration agreement in Queensland, but an agreement may be attached as a schedule to the land titles form creating the carbon sequestration right. The following table illustrates the different legislative structures between States:

<table>
<thead>
<tr>
<th>State</th>
<th>Carbon Sequestration Right</th>
<th>Carbon Sequestration Agreement</th>
<th>Interest in Land?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queensland</td>
<td>Carbon abatement interest</td>
<td>There is no legislative associated contract or covenant.</td>
<td>A carbon abatement interest is an interest in land.</td>
</tr>
<tr>
<td>Victoria</td>
<td>Carbon sequestration right</td>
<td>A forestry and carbon management agreement can be recorded on the land title register and will run with the land.</td>
<td>A carbon sequestration right is an interest in land. A forestry and carbon management agreement is not.</td>
</tr>
<tr>
<td>New South Wales</td>
<td>Carbon sequestration right</td>
<td>A forestry covenant can be recorded on the land title register and will run with the land.</td>
<td>A carbon sequestration right is deemed to be a profit à prendre and therefore an interest in land. A forestry covenant is an interest in land within the meaning of section 42 of the Real Property Act 1900.</td>
</tr>
<tr>
<td>Western Australia</td>
<td>Carbon right</td>
<td>A carbon covenant is an agreement that can be registered on the land title register and will run with the land.</td>
<td>A carbon right and a carbon covenant are both interests in land.</td>
</tr>
<tr>
<td>South</td>
<td>Forest property</td>
<td>There is no legislative associated contract or covenant.</td>
<td>A forest property (carbon)</td>
</tr>
</tbody>
</table>

332 Climate Change Act 2010 (Vic) s 27; Conveyancing Act 1919 (NSW) s 87A; Forestry Rights (Registration) Act 1990 (Tas) s 3; Carbon Rights Act 2003 (WA) pt 3; Forest Property Act 2000 (SA) s 5.
333 Forest Property Act 2000 (SA) ss 5, 6.
335 Land Title Act 1994 (Qld) s 97N.
336 Climate Change Act 2010 (Vic) ss 27, 28, 33.
337 Ibid s 25(1).
338 Conveyancing Act 1919 (NSW) ss 87A, 88EA(5); Real Property Act 1900 (NSW) s 42.
339 Conveyancing Act 1919 (NSW) s 88AB.
340 Once recorded on the register: Conveyancing Act 1919 (NSW) s 88EA(5).
341 Carbon Rights Act 2003 (WA) s 12.
342 Ibid ss 6, 12.
The above table illustrates the basic structure of a carbon sequestration right and associated carbon sequestration agreement. State legislation contains minimal guidance on the required or permitted contents of a carbon sequestration agreement. Parties are granted significant freedom to transact on their own terms, although the contents of a carbon sequestration agreement will be guided by relevant state and federal legislation.\textsuperscript{346} State legislation also does not address the enforceability of a carbon sequestration agreement against third parties who may have dealings with the land during the timeframe of the project.

### 8.5 Enforcement by Clean Energy Regulator

The CFI Act grants powers to the Regulator to ensure the longevity of carbon sequestered in the project area. This is necessary because sequestered carbon is vulnerable to disturbance from land clearing and events such as fire, pest attack, disease or decay.\textsuperscript{347} These events may result in a release of sequestered carbon back to the atmosphere. However, an ACCU represents one tonne of carbon dioxide that must remain \textit{permanently} sequestered in the project area for a minimum of one hundred years.\textsuperscript{348} The CFI Act attempts to ensure the permanent sequestration of carbon in a biosequestration offsets project through several mechanisms.

First, a ‘relinquishment requirement’ will be imposed upon the project proponent in certain circumstances where there has been a significant reversal of carbon sequestration.\textsuperscript{349} This will require the project proponent to surrender a certain number of ACCUs to the Clean Energy Regulator.

Secondly, a relinquishment requirement can be imposed if the reversal of carbon sequestration is not attributable to natural disturbance, reasonable actions taken to reduce the risk of bushfire, or conduct of a third party which the project proponent could not reasonably control.

\textsuperscript{343} However a forest property agreement is deemed to be a profit à prendre for the purposes of transactions conducted under the relevant land titles legislation: \textit{Forest Property Act 2000} (SA) s 12.

\textsuperscript{344} \textit{Forestry Rights (Registration) Act 1990} (Tas) ss 3, 6.

\textsuperscript{345} Ibid s 3.

\textsuperscript{346} Including relevant state carbon sequestration legislation, the \textit{Carbon Farming Act} and Regulations, and any applicable methodology determination.


\textsuperscript{348} \textit{Carbon Credits (Carbon Farming Initiative) Act 2011} (Cth) s 87.

\textsuperscript{349} Ibid ss 87-91 regarding relinquishment requirements.
Thirdly, it may be imposed where the reversal is due to natural disturbance or conduct of a third party which the project proponent could not reasonably control, and the project proponent has not taken reasonable steps to mitigate the damage.

Finally, a relinquishment requirement can be imposed if false or misleading information has been given in connection with the project, or the declaration of an eligible offsets project has been revoked. The declaration of an eligible offsets project may be revoked if the project proponent becomes insolvent, breaches certain legislation, or ceases to hold the application carbon sequestration right. Overall there are a wide range of circumstances in which a relinquishment requirement may be imposed.

If this requirement is not complied with within 90 days, a ‘carbon maintenance obligation’ may be imposed over the project area. This will prevent the landowner or any other person from engaging in activity that will result in a reduction below the ‘benchmark carbon sequestration level’, which is the amount of tonnes of carbon stored in the project area at the time the carbon maintenance obligation was declared. If there is a reduction below the benchmark carbon sequestration level, the landowner will have a positive obligation to take all reasonable steps to restore the sequestered carbon to the benchmark level. A carbon maintenance obligation will also prohibit the landowner or any other person from engaging in any activity that is not a ‘permitted carbon activity’. Imposition of a carbon maintenance obligation will place a large burden on the landowner and significantly reduce the marketability of the land. The carbon maintenance obligation will continue in force for one hundred years after the first ACCUs were issued for the project, unless a non-relinquishment penalty is paid. Alternatively, the total amount of ACCUs issued for the project can be surrendered and the carbon maintenance obligation will be removed. Both options for removal of a carbon maintenance obligation will prove expensive.

8.6 Link between ACCUs and the carbon pool
The CFI Act sets out strict requirements for measuring and calculating sequestered carbon for the issue of ACCUs. The project proponent can apply for a certificate of entitlement and once granted, the Clean Energy Regulator must issue the number of Australian Carbon Credit Units specified in the certificate to its holder. Applications for a certificate of entitlement can be made at regular time intervals, from annually to once every five years. An application for a certificate of entitlement must contain information necessary to calculate the total amount of carbon sequestered by the project. This will require a project proponent to monitor the project and take measurements in order to gather information on the amount of carbon sequestered. Furthermore, the applicable methodology determination may require the project proponent to monitor the project for events of disturbance.

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350 Ibid ss 36, 37, 65.
351 Ibid ss 90(4), 91(4), 97 regarding carbon maintenance obligations.
352 Ibid s 97(14).
353 Ibid s 99.
355 Ibid s 76.
356 Ibid ss 12, 13. Information in the application for a certificate of entitlement must include all of the calculations used to determine the carbon dioxide equivalent net abatement amount for the project: Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) ss 13, 76(4); Carbon Credits (Carbon Farming Initiative) Regulations 2011 (Cth) reg 6.2(e).
357 See for example, Carbon Farming (Quantifying Carbon Sequestration by Permanent Environmental Plantings of Native Tree Species using the CFI Reforestation Modelling Tool) Methodology Determination 2012 (Cth) s 4.3.
Remote sensory or satellite imagery can be used to monitor a project but this may not always be possible. It is likely that a project proponent will require access to the project area and rights to monitor the project and conduct measurements of sequestered carbon.

The general principle is that a project proponent will be issued with one ACCU for each tonne of carbon sequestered by the carbon pool. However, a risk of reversal buffer will be applied to the amount of ACCUs initially issued for a sequestration offsets project. This means that the amount of Australian Carbon Credit Units issued will be 5% less than the total amount of carbon sequestered. The risk of reversal buffer is designed to ‘insure the scheme’ against losses of sequestered carbon. This is necessary due to the tenuous link between the carbon pool and the ACCUs once issued.

The CFI Act distinguishes between the carbon sequestration right, which is the registered real property right used to support a biosequestration project, and the ACCU, which is personal property. Distinguishing between the two types of right allows ACCUs to be freely traded on the market separately from the carbon sequestration right. ACCUs are initially issued to the project proponent who holds the carbon sequestration right, but the credits can then be aggregated or disaggregated and traded on the market separately from the carbon sequestration right. After the first transaction, credits will pass to a third party who has no proprietary or contractual rights to the land upon which the biosequestration offsets project is conducted, and hence no legal means of ensuring that carbon remains sequestered on the land. If there is a reversal of sequestration, the result may be a ‘black hole’ where an ACCU is traded on the market purporting to represent permanent sequestration of emissions in circumstances where the sequestration is no longer effective. To avoid this situation, the CFI Act imposes regulatory sanctions to ensure permanent sequestration of carbon in the project area. These regulatory sanctions include relinquishment requirements and carbon maintenance obligations. However, the CFI Act allows for regulatory sanctions to be removed upon payment of a financial penalty.

8.7 Critique of the legal framework for biosequestration

Australia’s legal regime for biosequestration is well advanced in comparison to international jurisdictions. The CFI Act provides a comprehensive legal framework for the approval, operation and enforcement of biosequestration projects. State laws are sufficient to provide the minimal structure of a real property right that can be used to underpin biosequestration projects. However, there are a number of discrete issues which have been identified with the current legislative regime.

8.7.1 Underspecification of state carbon sequestration rights

A biosequestration offsets project must be underpinned by a carbon sequestration right gained under state law. The carbon sequestration right will need to grant sufficient rights to enable the project proponent to fulfil their responsibilities under the CFI Act. These responsibilities will include monitoring the biosequestration offsets project and taking measurements of the sequestered carbon.

Ibid.

Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) s 16.

Explanatory Memorandum, Carbon Credits (Carbon Farming Initiative) Bill 2011 (Cth) 68.

See Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) ss 97(14), 179.

This is likely to require access to the project area. Furthermore, a project proponent will be held responsible in the first instance for ensuring permanence of sequestered carbon. The proponent must have some measure of control over the project area in order to manage, maintain and ensure the permanence of sequestered carbon. Rights of access, monitoring, management and maintenance of the carbon pool are not conferred on a project proponent under the CFI Act or the state carbon sequestration legislation.

Currently, the only incident of a state carbon sequestration right is the ‘right to the benefit of carbon sequestration on land’ (or similar). The right to the benefit of carbon sequestration’ allows the holder to claim ACCUs for carbon sequestered on the land but does not allow him or her to ensure the permanence of the sequestered carbon. The creation of an interest in land without specifying any of its essential incidents, apart from the right to claim ACCUs, is wholly unsatisfactory. Furthermore, carbon sequestration rights that are conceptualised purely in terms of rights do not contemplate the responsibilities that a holder of the right must fulfil under the CFI Act. Mandatory incidents of a carbon sequestration right should be set out in state legislation including rights of control over the carbon pool to enhance and maintain carbon sequestration, rights of access to the land and rights to monitor and take measurements of sequestered carbon. These rights could fall along a wide spectrum, subject to negotiation between the parties.

A number of other incidents of a carbon sequestration right are underspecified by state legislation. This is problematic because an interest in land should be properly defined and specified, including rules for its mode of creation, recording or registration, transfer, enforcement, priority, termination and extinguishment. State carbon sequestration legislation does not address a number of these matters including grounds for termination, procedure upon default and removal of a carbon sequestration right (and associated agreement) from the land title register. A carbon sequestration right is an interest in land and therefore its termination may bring about a range of consequences under established property law doctrines. Termination of a carbon sequestration right may also lead to other consequences such as a relinquishment requirement under the CFI Act. Consequently, matters surrounding default, termination and removal from the land title register should be comprehensively addressed in state legislation.

Due to the under specification of state carbon sequestration rights, the associated carbon sequestration agreement will become the main source of rights and obligations for a landowner and project proponent conducting a biosequestration offsets project. A carbon sequestration agreement will presumably deal with matters including access to the project area, control, management and maintenance of the carbon pool, default, termination of the carbon sequestration right, and dealings with the land and the right. These essential matters will be determined by the contents of each individual carbon sequestration agreement, creating significant uncertainty and transaction costs for third parties who wish to assess the scope and attributes of a carbon sequestration right. A carbon sequestration agreement will be registered or recorded on the land title register, but this merely brings it to the attention of third parties such as prospective purchasers of the land. Registration or recording does not remove the need to assess the meaning and effect of a carbon sequestration agreement.

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363 *Land Title Act 1994 (Qld) s 97N; Climate Change Act 2010 (Vic) s 22; Conveyancing Act 1919 (NSW) s 87A; Carbon Rights Act 2003 (WA) s 8(1); Forestry Rights (Registration) Act 1990 (Tas) s 3; Forest Property Act 2000 (SA) s 3A(1).*

364 For example, relief against forfeiture: see *Shiloh Spinners Ltd v Harding* [1973] AC 691 at 725; *Legione v Hateley* (1983) 152 CLR 406.

365 *Once the project proponent ceases to hold the carbon sequestration right, the declaration of an eligible offsets project may be revoked leading to a requirement to relinquish a certain number of Australian Carbon Credit Units.*

The enforceability of a carbon sequestration right and agreement against third parties is also underspecified by state legislation. A carbon sequestration right is an interest in land and will therefore be enforceable by and against any successive landowner or holder of the right. The enforceability of a registered or recorded carbon sequestration agreement against a successive landowner is a more complicated issue. The agreement is generally recorded or registered on the land title register,367 but the legal effect of recording novel rights such as carbon sequestration agreements on the land title register is not fully established.368 However, it is clear that enforceability of a carbon sequestration agreement against third parties will be restricted to terms that are within the scope, subject matter and purpose of the authorising Act. Determining the implied legislative limits of a carbon sequestration agreement, and whether a particular term exceeds them, will require an exercise in statutory interpretation. It would be preferable for state carbon sequestration legislation to clarify the extent of a carbon sequestration agreement’s enforceability against third parties.

8.7.2 Carbon maintenance obligations over private land
The CFI Act implements the carbon maintenance obligation as a mechanism to ensure the permanence of sequestered carbon. A carbon maintenance obligation places a large burden upon the land by restricting land use activities, lowering the marketability of land and requiring a financial penalty to be paid for its removal.369 The carbon maintenance obligation attaches to the land and effectively places liability upon the landowner or occupier. The only legal basis for imposition of a carbon maintenance obligation is the written consent of the landowner required as part of the project proponent’s application for declaration of an eligible offsets project. The landowner is required to provide a ‘representation and warranty’ that he or she understands that a carbon maintenance obligation may be placed over the project land.370 It is unclear whether this written consent will translate into consent to the severe restrictions on land use that a carbon maintenance obligation may impose, particularly in light of the state provisions on indefeasibility of title.371 Furthermore, the land may be transferred during the term of the project. There is no requirement for a successive landowner to provide any form of consent to the project or the imposition of a carbon maintenance obligation.

The CFI Act requires that a carbon maintenance obligation must be recorded as part of the project details within the Register of Offsets Projects kept by the Clean Energy Regulator.372 This is a federal register without any connection to state land title registers. However, the CFI Act states that a carbon maintenance obligation ‘may’ be noted on the land title register.373 This notation is discretionary and may not occur in the absence of state legislation requiring a carbon maintenance obligation to be noted on the land title register. Failure to record a carbon maintenance obligation on the land title register may result in purchasers of land acquiring their interest unaware that it is subject to responsibilities imposed under the CFI Act.

367 Climate Change Act 2010 (Vic) ss 27, 28, 33; Conveyancing Act 1919 (NSW) ss 87A, 88EA(5); Carbon Rights Act 2003 (WA) s 12; Forestry Rights (Registration) Act 1990 (Tas) ss 3, 6.
369 See Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) ss 97(14)(a),(b), 99, 179.
371 Land Title Act 1994 (Qld) s 184; Transfer of Land Act 1958 (Vic) s 42; Real Property Act 1900 (NSW) s 42; Real Property Act 1886 (SA) ss 68, 69; Land Titles Act 1980 (Tas) ss 39, 40; Transfer of Land Act 1893 (WA) s 68. Note that Commonwealth legislation prevails over State legislation to the extent of any inconsistency: Commonwealth Constitution s 109.
372 Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) s 168(1)(n).
373 Ibid s 40.
8.7.3 The surrender of ACCUs under the carbon pricing mechanism

The carbon pricing mechanism allows a liable entity to use ACCUs from biosequestration offsets projects to meet their surrender obligations. Each ACCU represents one tonne of carbon dioxide sequestered by a biosequestration offsets project that will offset one tonne of the liable entity’s emissions. Carbon dioxide must remain permanently sequestered in the project area in order to effectively offset a liable entity’s emissions. However, there is no overriding duty placed on project proponents under the CFI Act to ensure that carbon stocks remain permanently sequestered. If carbon sequestration is reversed, project proponents have the option to pay a financial penalty instead of restoring sequestration levels. Payment of this penalty will not address the lost levels of carbon sequestration. Consequently, ACCUs surrendered under the carbon pricing mechanism may not represent permanent reduction of emissions where carbon sequestration is reversed and no action is taken to restore the carbon pool. This may affect the environmental effectiveness of both the carbon farming initiative and the carbon pricing mechanism.

8.8 Conclusions and Recommendations

The current legal framework for biosequestration attempts to strike a delicate balance between environmental, economic and social considerations. The environmental requirement of ensuring permanent sequestration of carbon must be balanced against the economic impacts of imposing long-term restrictions on land. Principles of ESD require that these considerations be properly integrated into the decision-making and compliance framework established under the CFI Act. A number of legislative reforms may be necessary to achieve this. The following reforms are recommended:

- State carbon sequestration rights should be defined in functional terms to confer essential rights of control, management, maintenance, access and monitoring. These rights will enable the holder to fulfil its responsibilities as a project proponent under the CFI Act.
- Carbon sequestration rights should be properly specified by state legislation. Specification should include grounds for termination of the right, procedure upon default, removal of the right from the land title register, assignment of a carbon sequestration right, and enforceability of a carbon sequestration right and associated agreement against third parties.
- The definition and incidents of a carbon sequestration right should be uniform across all states in order to simplify projects that cross state borders and facilitate international investment by providing a simpler regime for investors to navigate.
- A stronger legal basis is needed for the imposition of a carbon maintenance obligation upon private land. The standard Carbon Farming Initiative consent form may not be sufficient.
- Further consideration should be given to the surrender of ACCUs under the carbon pricing mechanism. Additional legal mechanisms may be necessary to ensure that ACCUs are not purporting to provide a permanent offset of a liable entity’s emissions where carbon sequestration has been reversed.

374 Clean Energy Act 2011 (Cth) s 5 (definition of ‘eligible emissions unit’).
375 See Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) s 179.
PART C: COMMON FINDINGS AND RECOMMENDATIONS FOR REFORM
9. Recommendations

The four legislative case studies have resulted in specific findings and recommendations. There are also a number of common findings across different stages of the carbon cycle that illustrate the overall strengths and weaknesses of the current regulatory framework governing the carbon cycle. A list of specific recommendations has been made arising from the common findings.

RECOMMENDATION 1: INTEGRATION OF THE CONCEPT AND PRINCIPLES OF ESD

The concept and principles of ESD should be integrated into legislation governing all stages of the carbon cycle. ESD principles should be clearly set out in the objects of legislation and integrated into the approval processes for projects across the carbon cycle. Legislation should mandate consideration of economic, social and environmental factors for approval of activities with the potential to cause environmental harm. Legislative requirements to consider and address greenhouse gas emissions from mining, petroleum and electricity projects will also be necessary to ensure ESD.

The concept of ESD and its principles such as the precautionary principle, the polluter pays principle and the integration of environmental, economic and social considerations into decision-making processes are central to a sustainable legal regime for the carbon cycle. Integration of the concept and principles of ESD must go beyond an acknowledgment of ecologically sustainable development in the objects of legislation. A portfolio of legal instruments will be necessary to ensure activities that are emissions-intensive or carry the risk of environmental harm are conducted in an ecologically sustainable manner. First, legislative provisions must require comprehensive assessment of the economic, social and environmental impacts of a proposed project as part of the decision-making process. This should include consideration of the environmental impacts of greenhouse gas emissions from emissions-intensive projects.

Current environmental and planning laws vest the decision-maker with a wide scope of discretion and can therefore result in outcomes that disregard greenhouse gas emissions and other environmental impacts. To rectify this, specific legal obligations should be placed upon decision-makers to consider and address greenhouse gas emissions and other environmental impacts. An example can be found in section 14 of the Climate Change Act 2010 (Vic). This section requires a decision-maker to consider a proposed project’s greenhouse gas emissions, including potential cumulative impacts of greenhouse gas emissions, and was applied in a recent Victorian Civil and Administrative Tribunal decision which considered and addressed greenhouse gas decisions from a proposed power station.376

Integration of the polluter pays principle within the legislative framework will require greater responsibilities to be placed upon the project proponent for emissions-intensive activities, such as mining, petroleum extraction and coal-fired electricity generation. Responsibilities could be placed upon project proponents through the imposition of conditions of approval requiring reduction or mitigation of greenhouse gas emissions. This form of condition of approval has rarely been imposed upon projects for the extraction and transformation of carbon, although it appears these conditions are

376 See Dual Gas Pty Ltd v Environmental Protection Agency [2012] VCAT 308 at [241]-[246].
becoming more common. Conditions imposed to date are likely to require the project proponent to implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions, or to prepare and implement a plan to manage or abate greenhouse gas emissions. Conditions requiring quantitative reduction or mitigation of greenhouse gas emissions are seldom imposed, and recent case authority indicates that mitigation conditions will be considered unnecessary due to the introduction of the carbon pricing mechanism.

Ideally, nationally consistent conditions of approval requiring reduction or mitigation of greenhouse gas emissions should be imposed upon projects for the extraction and transformation of carbon, in a manner that does not conflict with the carbon pricing mechanism. For example, conditions requiring emissions intensity standards and CCS-ready standards could be imposed upon new coal-fired electricity generation. These conditions would not conflict with the carbon pricing mechanism and should be imposed as a ‘safety net’ until there is a mature carbon market established in Australia.

It is noted that the recently introduced carbon pricing mechanism places financial responsibility upon liable entities for carbon emissions. However, this responsibility is substantially alleviated through the provision of transition assistance to coal-fired electricity generators and the coal mining sector. The future of the carbon pricing mechanism beyond 2013 is also uncertain.

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377 See Dual Gas Pty Ltd v Environmental Protection Agency [2012] VCAT 308. The Victorian Civil and Administrative Tribunal imposed a condition upon approval of a demonstration plant for coal gasification technology requiring that the federal Government enter into contracts for closure of at least 600MWe of coal-fired electricity generation in Victoria by 2020 before construction of the plant could commence. The subsequent failure of the Commonwealth Government’s Contract for Closure negotiations casts significant uncertainty on the future of this project. The VCAT also imposed conditions requiring an emissions intensity standard of 0.8 tonnes of carbon dioxide emitted per MWh of electricity generated, and that the project be CCS-ready. See also Lester v Minister for Planning and Ashton Coal Operations Pty Ltd [2011] NSWLEC 213 at [31]; Hunter Environment Lobby Inc v Minister for Planning [2011] NSWLEC 221.

378 Lester v Minister for Planning and Ashton Coal Operations Pty Ltd [2011] NSWLEC 213 at [31]; Hunter Environment Lobby Inc v Minister for Planning [2011] NSWLEC 221 at [35], [36].

379 Haughton v Minister for Planning and Macquarie Generation; Haughton v Minister for Planning and TRUenergy Pty Ltd [2011] NSWLEC 217 at [39], [40].

380 For example, in Xstrata Coal Qld Pty Ltd v Friends of the Earth [2012] QLC 13, the Coordinator-General did not consider it reasonable to impose a definitive offset condition on the project. Although the Coordinator-General recommended conditions for a greenhouse gas reduction management plan, there were ultimately no conditions in the draft environmental authority dealing with greenhouse gas emissions or climate change: at [506]-[508].

381 Hunter Environment Lobby Inc v Minister for Planning (No 2) [2012] NSWLEC 40 at [16].

382 See Re Xstrata Coal Queensland Pty Ltd [2007] QLRT 33 at [23] where it was observed that ‘absent universally applied policies for greenhouse gas reduction, requiring this mine (and no others) to limit or reduce its greenhouse gas emissions would be arbitrary and unfair’.

383 This potential difficulty was identified in Hunter Environment Lobby Inc v Minister for Planning (No 2) [2012] NSWLEC 40 which held that conditions requiring offset of greenhouse gas emissions should not be imposed because the carbon pricing mechanism scheme, together with the Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) and National Greenhouse and Energy Reporting Act 2007 (Cth), meets at a practical level the purpose of imposing a condition requiring the offsetting of scope 1 greenhouse gas emissions: at 16.

384 Dual Gas Pty Ltd v Environmental Protection Agency [2012] VCAT 308 at [349], [352].
RECOMMENDATION 2: INTEGRATION OF INTERNATIONAL, NATIONAL AND STATE POLICIES AND LAWS

(i) Integration of laws for the carbon cycle will result in greater emissions reductions and more sustainable environmental outcomes. International, national and state climate change and environmental policy and legislation should be integrated to provide interoperability of laws at all stages of the carbon cycle.

(ii) State laws should also be integrated to ensure that nationally consistent legal standards exist for sequestration projects.

(iii) Legal instruments such as the carbon pricing mechanism must be designed to work together with other regulatory schemes.

Fragmentation is a legal and institutional challenge which must be addressed in order to create an integrated and coherent legal regime for the sustainable use of carbon. There must be an integrated portfolio of laws designed to achieve the overall purposes of a legal regime for the carbon cycle. Separate, non-complementary laws that do not work together or even contradict each other will not reduce greenhouse gas emissions or produce environmentally sustainable outcomes.

First, there must be integration to ensure that legal frameworks are consistent between jurisdictions. Currently there is fragmentation between regulation of particular activities or rights in different jurisdictions. For example, legislation in each state deals differently with the definition and incidents of a carbon sequestration right, the structure of a carbon sequestration right and its associated agreement, and a carbon sequestration agreement’s registration and enforceability against third parties. This has resulted in six different forms of carbon sequestration right throughout Australia, each of which can be used to underpin a biosequestration offsets project conducted under the Carbon Farming Act. There is also fragmentation between the rights conferred upon the holder of a carbon sequestration right under state legislation, and the responsibilities imposed upon a project proponent by the Carbon Farming Act. State and Commonwealth laws must be designed to work together to ensure effective operation of biosequestration projects.

State and Commonwealth legal frameworks for carbon capture and storage projects are also fragmented in a number of respects. There are different provisions in each jurisdiction regarding ownership of components of a carbon capture and storage project and long-term liability for the project. Nationally consistent standards regarding the treatment of long-term liability for carbon capture and storage projects should be a priority for legislative reform.

There should be integration to ensure that legal instruments work consistently as a single instrument or in conjunction with other regulatory schemes. Regulation of all stages of the carbon cycle must work together to ensure that comprehensive liability is imposed for carbon emissions across the cycle and that carbon remains permanently sequestered. There are several instances of fragmentation between the carbon pricing mechanism and other regulatory schemes. ACCUs purporting to represent permanent sequestration of carbon emissions can be surrendered under the carbon pricing mechanism, yet the Carbon Farming Act allows for the payment of a financial penalty to release a project proponent from liability if carbon sequestration is reversed. The actual reversal of carbon sequestration resulting in a non-credible ACCU is not addressed through either the carbon pricing
mechanism or the Carbon Farming Act. Another example is the use of geosequestration projects to store carbon emissions that would otherwise be covered by the carbon pricing mechanism. A liable entity can reduce their reported emissions by the amount that is sent off for permanent storage, but the carbon pricing mechanism does not impose liability for any subsequent leakage of permanently stored carbon dioxide.

Fragmentation can also be found within the carbon pricing mechanism itself. One Part of the Clean Energy Act 2011 (Cth) imposes liability to surrender carbon units upon coal-fired electricity generators, while another Part provides transitional assistance in the form of free carbon units to coal-fired electricity generators. Transitional assistance is also provided to a number of other sectors that are liable to surrender carbon units such as the coal mining sector, the steel industry and other emissions-intensive trade exposed industries. The internal fragmentation created by provision of transitional assistance will ultimately hinder the effective operation of the carbon pricing mechanism.

Finally, there is a potential fragmentation between Australian and international legal requirements for creation of offset credits from biosequestration and geosequestration projects. For example, the Carbon Farming Act (Cth) uses a ‘positive’ list to satisfy additionality requirements for biosequestration projects while the Kyoto Protocol rules for biosequestration projects require a more complex additionality test to be satisfied. The fragmentation between Australian and international offset regimes may have consequences in terms of the ability to surrender ACCUs as eligible offset credits under the post-2012 Kyoto Protocol regime and other linked international carbon markets.

Challenges to integration of the legal regime for the carbon cycle may arise from the federal constitutional system that operates in Australia. The Commonwealth has limited legislative power to enact laws regulating land use and environmental matters, although several heads of constitutional legislative power could potentially be used to support environmental legislation. Integration of laws for the carbon cycle therefore becomes dependent upon the willingness of the states to co-operate with the Commonwealth and each other. This may not be feasible in the current political environment.

**RECOMMENDATION 3: RIGHTS TO CARBON MUST BE CLEAR AND FULLY SPECIFIED**

When new forms of carbon rights are created, these rights should be fully specified by statute. Neither traditional categories of property nor statutory agreements are an adequate source for specifying carbon rights. Traditional rules of property and land ownership are not flexible enough and statutory agreements are too variable. Legislation must clarify ownership and rights to access, extract, transform and sequester all forms of carbon.

A coherent set of rights to access, manage and control carbon in all its forms is essential for an integrated legal regime for the carbon cycle. All new property rights must be clear, stable, secure, and

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385 As well as the Energy Security Fund, transitional assistance includes the $983 million Coal Sector Jobs Package, $8.6 billion Jobs and Competitiveness Program and $300 million Steel Transformation Plan: Australian Government, Assistance for industry (Clean Energy Future, 2013) <http://www.cleanenergyfuture.gov.au/helping-business/assistance-for-industry-2/; 386 Commonwealth Constitution s 51(xxix) (‘external affairs power’) could be used to implement obligations in the Kyoto Protocol and the UNFCCC; s 51(xx) could be used to regulate trading and financial corporations. The federal government may also enact legislation on a subject matter not within the list of enumerated powers if all of the concerned States consent to it (Commonwealth Constitution s 51(3xvii)).
fully defined and specified. Clear and stable rights to carbon will assist in encouraging the uptake of sequestration projects and addressing liabilities for losses of sequestered carbon. New rights to carbon must also integrate with the large body of pre-existing property law in Australia, including established property rights such as ownership of private land, mortgages, leases and easements.

The traditional system of private land use and ownership is inadequate to clarify rights to carbon in its different forms. Originally this was evident from the classification of carbon sequestration rights as a ‘profit a prendre’ despite numerous conceptual difficulties surrounding this classification. Traditional property law doctrines are also inadequate to specify ownership of components of a geological sequestration project. Carbon capture and storage legislation does not address ownership of carbon dioxide during injection into underground formations and throughout the life of the project. This may lead to the application of the ill-fitting doctrine of fixtures and chattels to determine who owns sequestered carbon dioxide in the underground storage formation. Another example is the failure to specify the enforceability of long-term statutory agreements against third parties. This may lead to the application of established rules for covenants running with the land and provisions regarding indefeasible title. However, traditional land and property laws are not flexible enough to accommodate new forms of rights and activities. Their application will not result in legal clarity but instead add another layer of complexity for parties attempting to discern their rights and obligations relating to land.

The use of statutory agreements to define and specify new forms of rights to carbon is also inadequate. There is a common trend of using statutory agreements between private parties to facilitate biosequestration projects, and access to land for coal mining and coal seam gas extraction activities. Statutory agreements are poorly defined by statute and their terms are variable between transactions. The use of statutory agreements to create and specify rights to carbon will result in widespread inconsistencies and increase transaction costs for third parties dealing with the land.

To rectify these issues, there must be full legislative specification of ownership, obligations and liabilities surrounding new forms of rights and activities. Legislation must clearly set out ownership of different components of a biosequestration or geosequestration project. In particular the subject matter of a carbon sequestration right should be defined, and its incidents fully specified. Consideration should be given to amending greenhouse gas storage legislation to provide more secure and stable rights under an injection lease or licence. This must be balanced with the public interest in preventing harm from leakage of stored carbon dioxide.

Other miscellaneous issues surrounding rights to carbon must also be addressed, such as the property law implications of imposing a carbon maintenance obligation on private land under the Carbon Farming Act. There may also need to be further specification of carbon units and Australian Carbon Credit Units as ‘personal property’. In particular, treatment of these units under state property law regimes must be addressed.

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387 See Lord Wilberforce in National Provincial Bank v Ainsworth [1965] AC 1175 at 1251-52: ‘Before a right or an interest in land can be admitted into the category of property, or of a right affecting property, it must be definable, identifiable by third parties, capable in its nature of assumption by third parties and have some degree of permanence or stability’.
RECOMMENDATION 4: INTEGRATION OF ADAPTIVE MANAGEMENT PRINCIPLES

The use of an adaptive management approach may be effective to govern activities with a high risk of environmental harm. Government policy for adaptive management must be integrated into the legislative framework. Regulators must have comprehensive powers to respond to emerging information about environmental impacts and harm, including powers to suspend or cancel projects.

For an adaptive management approach to regulating environmental impacts to be effective, it must be integrated into the legislative framework. Legislation must define the parameters of the adaptive management approach, including key objectives and indicators of environmental harm, a range of regulatory powers to respond to emerging information on environmental impacts, and thresholds for taking action. Current Queensland regulation places a number of reporting, monitoring and notification requirements upon project proponents as a method of addressing the environmental impacts of coal seam gas projects. Apart from the ‘make good’ obligation imposed upon project proponents to address groundwater impacts, there is minimal legislative scope for regulatory responses to emerging information about adverse environmental impacts. Legislative reform is required to implement a true adaptive management approach to regulation of coal seam gas projects.

RECOMMENDATION 5: MANAGING THE INFORMATION COSTS OF NEW PROPERTY

Transparency of rights to carbon is necessary to facilitate dealings and reduce information costs. All forms of statutory agreements expressed to bind successors in title should be recorded and searchable through the land information system available to the public, and a mechanism introduced for prospective purchasers, mortgagees and lessees to obtain a copy. Likewise restrictions attaching to a landowner’s title, such as under the Carbon Farming Act should be recorded on the land title register or land information system. Consideration should be given to the role of the land title register in making interests in land and restrictions arising from carbon rights publicly available.

New forms of rights to carbon including carbon sequestration rights, carbon sequestration agreements, access agreements and conduct and compensation agreements should be transparent. Currently, legislation provides that statutory agreements “run with the land” and are enforceable against third parties such as successive landowners. The scope and content of statutory agreements is generally poorly defined, granting parties a large degree of freedom to insert their own terms. There is significant uncertainty surrounding the enforceability of statutory agreements against third parties and their interaction with traditional property interests such as mortgages and leases. The wide discretion afforded to parties to insert their own terms will also lead to transaction costs for third parties who are involved in dealings with the relevant land. Third parties will incur the costs of discovering what rights exist in the asset (search costs) and the costs of assessing the scope and attributes of the rights (measurement costs). This is compounded by the fact that the existence and contents of a statutory agreement may not be noted on the land title register.

Information regarding statutory agreements and other forms of rights to carbon must be available to the public, particularly third parties who may have dealings with the relevant land. This may be achieved through legislation mandating that state land title registers accurately reflect any new forms
of rights or restrictions over private land. For example, it should be mandatory for novel restrictions imposed under the Carbon Farming Act, such as carbon maintenance obligations, to be recorded on the state land title register or land information system.

RECOMMENDATION 6: ALLOCATION OF LONG-TERM RESPONSIBILITY FOR PROJECTS ACROSS THE CARBON CYCLE

The long-term risks of environmental harm cannot be adequately managed through tortious or contractual means. To protect the public interest over the longer term, responsibility for environmental harm from extraction and sequestration activities must be clearly allocated by statute.

Geosequestration projects and coal seam gas projects carry long-term risks of environmental harm. Biosequestration and geosequestration projects also require imposition of long-term responsibilities to ensure that carbon remains permanently sequestered in the carbon pool. The time frame for responsibilities to ensure that carbon remains sequestered will extend to one hundred years or more for a biosequestration project, and until the end of the site closure period for a geosequestration project. Proponents of geosequestration projects will face the additional challenge of uncertainty surrounding the thresholds and timing of site closure.

Long-term responsibilities for environmental harm, or reversal of carbon sequestration, cannot be adequately managed through contract or tortious means. Legislation must clearly allocate long-term responsibilities for environmental harm resulting from geosequestration and coal seam gas extraction projects. Clear allocation of responsibilities will protect the public interest over the longer term, and increase certainty and encourage commercial investment in sequestration projects.
10. Project Publications List


Christensen, Sharon, Nicola Durrant, Pamela O’Connor and Angela Phillips, ‘Regulating Greenhouse Gas Emissions from Coal Mining Activities in the Context of Climate Change’ (2011) 28(6) Environmental and Planning Law Journal 1


Durrant, Nicola, ‘The Australian Response to Climate Change: Business as usual or legal innovation?’ (2010) 22(3) Environmental Law and Management 105


11. Glossary

Biosequestration – absorption of carbon dioxide by trees, vegetation, soil and other organic plant matter.

Carbon Farming Initiative – the Australian Government’s scheme to encourage farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land.

Carbon Pricing Mechanism – the Australian Government’s mechanism for placing a price on carbon dioxide emissions. The mechanism is comprised of: (a) a fixed price of carbon for three years from 1 July 2012 to 1 July 2015; and (b) an emissions trading scheme from 1 July 2015 onwards. The mechanism only applies to certain entities.

Clean Energy Regulator – the Australian Government entity responsible for administering legislation that will reduce carbon emissions and increase the use of clean energy.

Climate Change – a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere.\(^{388}\)

Ecologically Sustainable Development – development that meets the needs of the present without compromising the ability of future generations to meet their own needs.\(^{389}\)

Geosequestration – injection and permanent storage of carbon dioxide into underground geological formations. Commonly referred to as ‘carbon capture and storage’.

Kyoto Protocol – an international treaty made under the United Nations Framework Convention on Climate Change. It sets binding greenhouse gas emission reduction targets for each developed country, although not all countries have ratified the Protocol.

Mitigation – avoiding or reducing the severity or intensity. Used in the context of mitigating greenhouse gas emissions or the impacts of climate change throughout this report.

Transaction costs – transaction costs include the cost of discovering what rights exist in an asset (search costs), assessing the scope and attributes of the rights (measurement costs) and negotiating to acquire them (bargaining costs).

United Nations Framework Convention on Climate Change – an international environmental treaty aimed at addressing climate change and stabilising atmospheric greenhouse gas concentrations.

\(^{388}\) UNFCCC art 1(2).
\(^{389}\) Bruntlandt Report at ch 2.
12. Bibliography


Argent, Robert, ‘Components of Adaptive Management’ in Catherine Allan and George Stankey (eds), Adaptive Environmental Management (Springer, 2009)


Barton, Barry and Aileen McHarg, Property and the Law in Energy and Natural Resources (Oxford University Press, 2010)

Bates, Gerald, Environmental Law in Australia (LexisNexis Butterworths, 7th ed, 2010)


Bradbrook, Adrian and Susan MacCallum, Bradbrook and Neave’s Easements and Restrictive Covenants (LexisNexis Butterworths, 3rd ed, 2011)

Briese, Robyn, ‘Climate Change Mitigation Down Under: Legislative responses in a federal system’ (2010) 13 Asia Pacific Journal of Environmental Law 75


Christoff, Peter, ‘Can the Invisible Hand Adjust the Thermostat? Carbon emissions trading and Australia’ in Tim Bonyhady and Peter Christoff (eds), Climate Law in Australia (Federation Press, 2007) 87

Commonwealth Department of Climate Change, Carbon Pollution Reduction Scheme Green Paper (Commonwealth of Australia, 2008)


Commonwealth Treasury, Strong Growth, Low Pollution: Modelling a carbon price (Commonwealth of Australia, 2011)


Deloitte, Investment Reference Group Report: A report to the Commonwealth Minister for resources and energy (Commonwealth Department of Resources, Energy and Tourism, April 2011)


Durrant, Nicola, Legal Responses to Climate Change (Federation Press, 2010)

Ecologically Sustainable Development Steering Committee, National Strategy for Ecologically Sustainable Development (Commonwealth of Australia, 1992)


Geoscience Australia and Dr M.A. Habermehl, Summary of Advice in Relation to the Potential Impacts of Coal Seam Gas Extraction in the Surat and Bowen Basins, Queensland: Phase one report summary for the Australian Government Department of Sustainability, Environment, Water, Population and Environment (2010)


Hawkins, Slayde et al, Contracting for Forest Carbon: Elements of a model forest carbon purchase agreement (Duke Law, Forest Trends and Katoomba Group, 2010)


Hepburn, Samantha, ‘Interpretive Strategies in the Overriding Legislation Exception to Indefeasibility’ (2009) 21(2) Bond Law Review 86

Intergovernmental Panel on Climate Change, *Special Report on Carbon Dioxide and Storage: Summary for policy makers and technical summary* (Intergovernmental Panel on Climate Change, 2005)


Massachusetts Institute of Technology, *The Future of Coal: Options for a carbon-constrained world* (Massachusetts Institute of Technology, 2007)


McLaren, James, and James Fahey, ‘Key Legal and Regulatory Considerations for the Geosequestration of Carbon Dioxide in Australia’ (2005) 24 *Australian Resources and Energy Law Journal* 45


Passero, Michelle, ‘The Nature of the Right or Interest Created by a Market for Forest Carbon’ (2008) 3 Carbon and Climate Law Review 249

Pohlmann, Markus, ‘The European Union Emissions Trading Scheme’ in David Freestone and Charlotte Streck (eds), Legal Aspects of Carbon Trading: Kyoto, Copenhagen and beyond (Oxford University Press, 2009) 338

Preston, Brian, ‘Climate Change Litigation (Part 2)’ (2011) 5(2) Carbon and Climate Law Review 244


Rosenbaum, Kenneth, Dieter Schoene and Ali Mekouar, Climate Change and the Forest Sector – Possible national and subnational legislation (Food and Agriculture Organisation of the United Nations, 2004)


Stanford, Jon, Power Generation in a Carbon Constrained World: Implications for the Australian resources sector (Deloitte Touche Tohmatsu, 2009)

Takacs, David, Forest Carbon: Law and property rights (Conservation International, 2009)


Wilkins, Roger, Strategic Review of Australian Government Climate Change Programs (Commonwealth of Australia, 2008)