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Annex 9.1 National legal case study of Climate Engineering in Australia

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D4.2 Comparative analysis of national legal case studies

December 2022 Draft version submitted to the European Commission for review





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D4.2 National legal case studies: Annex 9.1 Climate Engineering in Australia				
Work Package		WP4 Policy, legal and regulatory analysis		
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Date published		21/12/2022		
Version number	1.0		Status	Final

Version control		
Version	Date	Description
0.1	25/07/2022	Outline
0.2	05/09/2022	First draft
0.3	28/10/2022	Draft for inclusion in D4.2 and QA
1.0	21/12/2022	D4.2 final version

Keywords

Climate engineering; Solar Radiation Management; Carbon Dioxide Removal; Climate Law; Environmental Law; Human Rights Law; International Maritime Law; Australian Law; Australian Human Rights Commission; Marine Cloud Brightening



The TechEthos Project

TechEthos is an EU-funded project that deals with the ethics of the new and emerging technologies anticipated to have high socio-economic impact. The project involves ten scientific partners and six science engagement organisations and runs from January 2021 to the end of 2023.

TechEthos aims to facilitate "ethics by design", namely, to bring ethical and societal values into the design and development of new and emerging technologies from the very beginning of the process. The project will produce operational ethics guidelines for three to four technologies for users such as researchers, research ethics committees and policy makers. To reconcile the needs of research and innovation and the concerns of society, the project will explore the awareness, acceptance and aspirations of academia, industry and the general public alike and reflect them in the guidelines.

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List of abbreviations

Table 1: List of Abbreviations

Term	Explanation
AC	Companion of the Order of Australia
ACCU(s)	Australian Carbon Credit Unit(s)
ACT	Australian Capital Territory
ARC	Australian Research Council
BECCS	Bio-energy with carbon capture and storage
CAT	United Nations Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment
CBD	Convention on Biological Diversity
CCS	Carbon capture and storage
CCUS	Carbon capture, use and storage
CDR	Carbon-dioxide removal
CE	Climate engineering
CEDAW	United Nations Convention on the Elimination of All Forms of Discrimination against Women
CERD	International Convention on the Elimation of All Forms of Racial Discrimination
CRC	United Nations Convention on the Rights of the Child
CRPD	Convention on the Rights of People with Disabilities
Cth	Commonwealth (federal law)
DAC	Direct air-capture



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DACCS	Direct air-capture with carbon capture and storage
DCCEEW	Department of Climate Change, Energy, the Environment and Water
EIA	Environmental Impact Assessment
ENMOD	Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques
ЕРВСА	Environmental Protection and Biodiversity Conservation Act 1999 (Cth)
ERAC	Emissions Reduction Assurance Committee
ERF	Emissions Reduction Fund
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
IPCC	Intergovernmental Panel on Climate Change
МСВ	Marine Cloud Brightening
МСВР	Marine Cloud Brightening Protect (University of Washington)
NDC	Nationally Determined Contribution
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NSW	New South Wales
NT	Northern Territory
OF	Ocean fertilisation
Qld	Queensland
R&D	Research and development
RRAP	Reef Restoration and Adaptation Program
SA	South Australia
SCoPEx	Stratospheric Controlled Perturbation Experiment (Harvard)
SDA	Environment Protection (Sea Dumping) Act 1981 (Cth)
SRM	Solar Radiation Management
Tas	Tasmania



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Annex 9.1 National legal case study: Climate engineering in Australia

UDHR	Universal Declaration of Human Rights
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNTS	United Nations Treaty Series
Vic	Victoria
WA	Western Australia
WP	Work Package



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Abstract

The objective of this report is to review the current state of the law and legal responses to solar radiation management and carbon dioxide removal technologies in Australia. It focuses on Australia's obligations under international law, as well as issues arising from domestic human rights law, environmental law and climate law. It sets out the extent to which these legal domains are capable of regulating climate engineering research and deployment as currently instantiated, before highlighting gaps and challenges facing the existing legal framework.

A summary overview of the main findings and legal issues surrounding climate engineering in Australia is provided in section 3.1.1 of the TechEthos D4.2 Comparative analysis of national legal case studies. This report is primarily aimed at informing the Australian government and Australian policymakers regarding the regulatory challenges of climate engineering in Australia. Furthermore, it provides further background to readers to the specific Australian context of the main points and key regulatory challenges identified in the comparative analysis to which this report is annexed.

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1. Introduction

Climate engineering techniques have the potential to interact with extant law in Australia in important respects, while also presenting novel regulatory challenges to which Australian law will have to adapt. This study highlights areas in which existing Australian legal frameworks bear relevance to climate engineering – both research and deployment – either imminently or in the further future. It also identifies ongoing and potential legal developments.

This report is a case study of how climate engineering technologies are regulated in Australian law.

Climate Engineering is defined under this project as 'the deliberate large-scale intervention in the Earth's climate system, in order to moderate global warming'.¹

Climate Engineering techniques² can be divided into Solar Radiation Management (SRM), and Carbon Dioxide Removal (CDR). SRM techniques reduce the heating effect of the Sun on the Earth's atmosphere by reflecting solar radiation before it can be absorbed by the Earth's surface and re-emitted as heat. Carbon Dioxide Removal techniques reduce the heating effect of the Sun on the Earth's atmosphere by reducing the abundance of molecules that absorb heat energy.

CDR techniques are included in most models surveyed by the Intergovernmental Panel on Climate Change (IPCC) that imply a possibility of keeping global average temperature rise below 1.5C or 2C above the pre-industrial baseline.³ No such techniques are sufficiently developed for any deployment capable of producing the scale of negative emissions represented in these models. It is therefore a mainstream view that swift progress in the development and large-scale deployment of CDR techniques is necessary to avoid seriously dangerous warming. Thus, CDR is considered a near-term, and indeed an ongoing form of intervention.

Carbon removed from the atmosphere must be permanently stored for such techniques to be effective. Storage is perhaps the major source of regulatory challenges with respect to CDR (e.g. forestry

³ P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, and M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley (eds) (2022) 'IPCC, 2022: Summary for Policymakers', in *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK and New York, NY USA: Cambridge University Press., §B.6.4



¹ Shepherd, J., Caldeira, K., Cox, P., Haigh, J., Keith, D., Launder, B., & Mace, G. (2009). *Geoengineering the Climate: Science, Governance, and Uncertainty*. Available at:

https://royalsociety.org/~/media/royal_society_content/policy/publications/2009/8693.pdf (Accessed 25 October 22); see also Adomaitis, L., Grinbaum, A., Lenzi, D. (2022). TechEthos D2.2: Identification and specification of potential ethical issues and impacts and analysis of ethical issues of digital extended reality, neurotechnologies, and climate engineering. TechEthos Project Deliverable. Available at: www.techethos.eu.

² Following the convention established by TechEthos Deliverable 2.2, this report refers to climate engineering "techniques" rather than "technologies", as some SRM techniques are speculative proposals for physical intervention in the earth's atmosphere rather than concrete socio-technical systems, and some CDR techniques have been practiced for millennia.

regulation, safety regulations for geological storage, and rules on land use), although certain proposed interventions themselves present regulatory challenges (for instance in relation to the prevention of harmful impacts on terrestrial and marine ecosystems). A survey of the CDR techniques judged most significant by the IPCC is offered in **TechEthos Deliverable 2.2.**⁴

SRM techniques, meanwhile, are in many cases speculative proposals for experimentation, and the prospects for their eventual deployment are uncertain, due to technical considerations, but also due to ethical, political and regulatory considerations. The most pressing regulatory challenges concern the governance of research into such techniques, the establishment of systems of governance for any future deployment with global scope, and the regulation of proposals for geographically localised shielding from solar radiation. A survey of the most significant proposals for SRM is offered in **TechEthos Deliverable 2.2**.⁵

1.1 Purpose of the Australian legal case study

The subject of this case study was selected to complement the other case studies being conducted under this Task. At least one common law jurisdiction and at least one civil law jurisdiction was selected for each of the three technology families, to ensure a full range of legal frameworks would inform the comparative legal analysis. As an extensive study of EU law (and international law) in relation to the technology families is conducted under task 4.3, it was also judged advantageous to represent both EU and non-EU jurisdictions in the national case studies, in order to explore both how EU law is operationalised at a national level, and how non-EU frameworks differ from EU approaches.

Australia, as a non-EU common law jurisdiction, was selected in particular because of its unique policy outlook in relation to climate engineering. Australia has one of the most advanced policies on CCS investment, research and development of any country in the world. It is host to the world's largest dedicated geological storage operation, and it developed one the world's first examples of CCS-specific legislation.⁶ This means it is uniquely positioned to illustrate prospects and challenges in relation to the regulation of CE methods that involve CCS: BECCS and DACCS. In addition, Australia is at time of writing the only jurisdiction in which Marine Cloud Brightening technology is being actively deployed.⁷

The following table provides an overview of the nine national legal case studies conducted as part of part of the *Comparative analysis of national legal case studies* (D4.2 of the TechEthos project):

Climate Engineering	Neurotechnologies	Digital Extended Reality
Australia	Germany	France
Austria	Ireland	Italy
United Kingdom	United States	United Kingdom

Table 2: Overview of nine national legal case studies (TechEthos WP4)

⁷ Tollefson, J. (2021) 'Can artificially altered clouds save the Great Barrier Reef?', *Nature*, 596(7873), pp. 476–478. Available at: <u>https://doi.org/10.1038/d41586-021-02290-3</u>.





⁴ Adomaitis, L., Grinbaum, A., Lenzi, D. (2022). TechEthos D2.2: Identification and specification of potential ethical issues and impacts and analysis of ethical issues of digital extended reality, neurotechnologies, and climate engineering. TechEthos Project Deliverable. Available at: www.techethos.eu, §4.1.1-8 ⁵ Ibid., §4.2.1-3

⁶ Global CCS Institute (no date) *The Global Status of CCS: 2021*. Australia, p.27. Available at: <u>https://www.globalccsinstitute.com/wp-content/uploads/2021/10/2021-Global-Status-of-CCS-Global-CCS-Institute-Oct-21.pdf</u>

1.2 Structure of the study

Section 2 begins by giving an overview of the policy outlook on Climate Engineering in Australia, noting significant existing projects and government-funded programmes. It sets out which are the most relevant regulatory institutions with responsibility for enforcement and notes potential future directions for policy development.

Section 3 then sets out the most salient legal issues with respect to climate engineering in Australia across 3 domains of law: human rights law (Section 3.1), environmental law (Section 3.2), and climate law (Section 3.3). Section 4 develops an analysis of potential gaps and challenges facing Australian legal frameworks with respect to climate engineering, on the basis of the foregoing discussion of the three domains. Finally, Section 5 offers an overall conclusion to the study by noting lessons that can be drawn internationally from the Australian case.

1.3 Scope and limitations

This national legal case study on Australia was prepared as part of TechEthos Work Package 4, on policy, legal and regulatory analysis. Its scope is defined by the task's workplan. It is beyond the scope defined by this workplan to conduct a comprehensive survey of all relevant Australian statutes, regulations and cases. Instead, the aim of the study is to provide a high-level overview of the regulatory landscape for climate engineering in Australia, on the basis of the prior identification of three salient legal domains: human rights law, environmental law and climate law. This structure is intended to facilitate a comparative analysis with the other national case studies being conducted on climate engineering in Austrian law and in UK law. The study also highlights potential legal challenges which have arisen as especially salient in recent academic literature on this subject.

1.4 Introduction to the Australian legal system

The Australian legislative system is based broadly on the Westminster model (the Parliament of the United Kingdom) but is also heavily influenced by the Washington system (the United States of America's Congress). The functioning of the Australian legislative system is defined by the Australian Constitution (1900), an Act of Parliament of the United Kingdom.⁸ It establishes a bicameral parliament consisting of a lower house, the House of Representatives, and an upper house, the Senate. Unlike the Westminster model, in which the House of Lords does not have power to prevent key bills becoming law, the two chambers of Australia's Parliament have equal power and all bills must pass in both chambers to become law.⁹

The Australian constitution establishes Australia as a federal system of government. As such, it consists of three levels of government: federal Parliament, which makes laws for all of Australia, the parliaments of the six states (New South Wales (NSW), Victoria (Vic), Queensland (Qld), Western Australia (WA), South Australia (SA), Tasmania (Tas)) and two territories (Australian Capital Territory (ACT), Northern Territory (NT)), which each make laws for their state or territory, and local councils, which make by-laws

 ⁸ Commonwealth of Australia Constitution Act 1900 : an act to constitute the Commonwealth of Australia South Australia Parliament (1900). Available at: <u>https://www.aph.gov.au/constitution</u>.
 ⁹ Infosheet 20 - The Australian System of Government (no date). Available at: <u>https://www.aph.gov.au/About Parliament/House of Representatives/Powers practice and procedure/0</u>
 0 - Infosheets/Infosheet 20 - The Australian system of government (Accessed: 3 October 2022).





for their region or district.¹⁰ The official name of the Australian state is the Commonwealth of Australia. Law which applies to the whole of Australia (federal law) is referred to as Commonwealth law (Cth), as distinct from state or territory law.

Australia is a common law jurisdiction, meaning precedents established by earlier judgements, especially by superior courts, have legal force in Australian courts. These precedents can be traced back to the decisions of English courts beginning after the Norman conquest of Britain, and originally reflected judges' assessment of local customs. Common law jurisdictions are contrasted against civil law jurisdictions, where judges have less power to create law via the interpretation of earlier decisions and must instead rely upon codified principles.

Unlike other jurisdictions, for example the United States of America, the Constitution of Australia does not contain a Bill of Rights. Its principal role is to determine the form and function of Australia's legislative institutions. However, it does contain explicit protections for five civil and political rights: the right to vote,¹¹ the right against acquisition of property on unjust terms,¹² the right to trial by jury,¹³ freedom of religion,¹⁴ and the prohibition of discrimination on the basis of State of residency.¹⁵ The High Court of Australia has also found that implicit rights protections can be derived from the structure of the Constitution. For example, the court has ruled that the form of government defined by the constitution implies the right to debate political issues.¹⁶

Australia follows the convention of legal dualism. As such, international treaties must be codified or otherwise reflected in domestic law to be applied by Australian courts. The exception to this principle is that Australian courts have found international law to be an important influence on the common law; judges have in some cases found international law to have direct force in Australian courts by this mechanism.¹⁷ Australia is a party to several international treaties which are relevant to the research and deployment of climate engineering techniques. These include the United Nations human rights covenants: the International Covenant on Civil and Political Rights (ICCPR)¹⁸ and the International Covenant on Economic, Social and Cultural Rights (ICESCR).¹⁹ They also include the United Nations

https://treaties.un.org/doc/Publication/UNTS/Volume%20993/v993.pdf (accessed 24 October 2022)



¹⁰ Three levels of government: governing Australia - Parliamentary Education Office (no date). Available at: <u>https://peo.gov.au/understand-our-parliament/how-parliament-works/three-levels-of-government/three-levels-of-government-government-governing-australia/</u> (Accessed: 3 October 2022).

¹¹ Commonwealth of Australia Constitution Act 1900 : an act to constitute the Commonwealth of Australia South Australia Parliament (1900). Available at: https://www.aph.gov.au/constitution., Section 41

¹² Ibid., Section 51 (xxxi)

¹³ Ibid., Section 80

¹⁴Ibid., Section 116

¹⁵ Ibid., Section 117

¹⁶ How are human rights protected in Australian law? | Australian Human Rights Commission (no date). Available at: <u>https://humanrights.gov.au/our-work/rights-and-freedoms/how-are-human-rights-protected-australian-law</u> (Accessed: 3 October 2022).

¹⁷ Vines, P. (2013) *Law and Justice in Australia: Foundations of the Legal System*. Third Edition. Oxford, New York: Oxford University Press. p.27

¹⁸ UN General Assembly, *International Covenant on Civil and Political Rights*, 16 December 1966, United Nations, Treaty Series, vol. 999, p. 171, available at:

https://treaties.un.org/doc/Publication/UNTS/Volume%20999/v999.pdf (accessed 24 October 2022) ¹⁹ UN General Assembly, *International Covenant on Economic, Social and Cultural Rights*, 16 December 1966, United Nations, Treaty Series, vol. 993, p. 3, available at:

Framework Convention on Climate Change,²⁰ and the United Nations Framework Convention on Biological Diversity.²¹²²

The Australian legal system also recognises Indigenous Customary Law as a source of law. Before 1992, Australian law operated under the legal fiction that the territory of Australia was *terra nullius* prior to settlement by Europeans, meaning land that was uninhabited and owned by no-one. This convention was superseded in the judgement *Mabo vs Queensland* (1992),²³ in which the High Court ruled that title to land could exist independently of the common law, on the basis of Indigenous customary law.²⁴ The status of indigenous customary law in Australia remains the subject of debate.

Table 3: Court Hierarchy in Australia

	Court Hierarchy in Australia
Higher	 High Court of Australia Federal courts State/Territory Supreme Courts District Courts Local Courts
Lower	

Table 4: Sources of Law in Australia

Sources of Law in Australia

- The Australia Constitution (An Act of Parliament of the United Kingdom)
- Common law (Case law)
 - Statute law, including:
 - o Commonwealth (Federal) Statute Law
 - o State Statute Law
 - Local Government Law
- Indigenous Customary Law
- International Treaties (implemented through domestic statute law)

²⁰ UN General Assembly, *Framework Convention on Climate Change*, 9 May 1992, United Nations, Treaty Series, Vol.1771, p.107, available at: <u>https://treaties.un.org/doc/Treaties/1994/03/19940321%2004-56%20AM/Ch_XXVII_07p.pdf</u> (accessed 24 October 2022)

²¹ UN General Assembly, *Convention on Biological Diversity*, 5 June 1992, United Nations, Treaty Series, Vol.1760, p.79, available at: https://treaties.un.org/doc/Treaties/1992/06/19920605%2008-44%20PM/Ch_XXVII_08p.pdf (accessed 24 October 2022)

²² International human rights system (no date) Attorney-General's Department. Available at: <u>https://www.ag.gov.au/rights-and-protections/human-rights-and-anti-discrimination/international-human-rights-system</u> (Accessed: 3 October 2022).

 ²³ Mabo v Queensland (No 2) ("Mabo case") [1992] HCA 23; (1992) 175 CLR 1 (3 June 1992)
 ²⁴ Vines P. (2013), supra note 6, p.8

1.5 Current state of Climate Engineering in Australia

There is at least one ongoing project in Australia which involves SRM research, the Reef Restoration and Adaption Project, which received initial funding in 2018, and began its 'R&D phase' in 2020.²⁵ This project involves field testing of Marine Cloud Brightening and Ground-Based Albedo Modification technologies.²⁶ It is funded by the Commonwealth Government via the Reef Trust Partnership.

There is also at least one CDR scheme using novel technology at an advanced stage of planning: *AspiraDAC*. This is a Direct Air Capture with Carbon Capture and Storage (DACCS) project that has secured funding via the Commonwealth Government and an advanced purchase from the Frontier Fund, an organization backed by major corporations including Meta and Alphabet.²⁷ The project will use solar energy to power the facility, and will use geological storage in partnership with ongoing Carbon Capture and Storage (CCS) schemes.²⁸

These projects will be discussed in more detail in subsequent sections.

²⁸ DAC company launches with first purchases from Frontier (June 2022) AspiraDAC. Available at: <u>https://www.aspiradac.com/dac-company-launches-with-first-purchases-from-frontier</u> (Accessed: 3 October 2022).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

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²⁵ 'The Program' (no date) *Reef Restoration and Adaptation Program*. Available at: <u>https://gbrrestoration.org/the-program/</u> (Accessed: 3 October 2022).

²⁶ 'Interventions' (no date) *Reef Restoration and Adaptation Program*. Available at: https://gbrrestoration.org/interventions/ (Accessed: 30 July 2022).

²⁷ Readfearn, G. (2022) 'Australian company secures \$700,000 deal for carbon capture and storage machine', *The Guardian*, 1 July. Available at:

https://www.theguardian.com/environment/2022/jul/02/australian-company-secures-700000-deal-forcarbon-capture-and-storage-machine (Accessed: 3 October 2022).

2. Climate Engineering-specific legal developments

This section provides an overview of the legal and policy developments pertaining to climate engineering in Australia. It examines relevant policies and laws in relation to climate engineering and identifies the national authorities involved in the implementation and enforcement of such laws and policies.

Australian policy on Climate Engineering

SRM

The Australian government has no active policy on SRM for the purpose of climate engineering,²⁹ which according to the above definition, is a large-scale intervention, aimed at moderating global warming. SRM can however also be deployed at a small scale, with aims other than moderating global warming. For instance, the relevant actors might aim simply to protect local ecology from extreme conditions when the need arises, rather than aiming to moderate warming generally and continuously, or until sufficient mitigation of greenhouse gas emissions has been achieved.

It is ambiguous whether such interventions are correctly described as climate engineering, rather than, for instance, adaptation. However, they use the same technology and engender similar ethical and regulatory concerns as SRM for the purpose of climate engineering. Australia is unique in that active field and testing for such a small-scale SRM is ongoing, as part of the Reef Restoration and Adaptation Program (RRAP). The RRAP aims to use SRM techniques (among other interventions) to protect the Great Barrier Reef (GBR) from heat-induced degradation, including bleaching. Reef protection is a priority for the Australian Government, as the GBR is one of the most significant sites for biodiversity worldwide, and an important source of revenue from tourism.

The RRAP is funded by the Commonwealth Government and the State of Queensland. An initial concept feasibility phase with funding of AU\$6mil began in 2019. A further AU\$100mil of funding was awarded by the Commonwealth Government covering the first 5 years of a planned 10 year R&D phase, beginning in 2020. This is supplemented by further funding from charitable organisations and research organisations, bringing total funding to AU\$300mil for the first 5 years.³⁰

The interventions under investigation by the RRAP include cooling by cloud brightening, shading by fogging, shading by misting, shading by surface films, shading by microbubbles and shading by algae (among others).³¹ All of these are forms of albedo modification and as such are forms of SRM, with the exception of shading by algae. The promotion of ocean algae growth is however considered to be a candidate form of CDR.³² Of these, Marine Cloud Brightening (MCB) is the most significant from a governance standpoint, because of its potential to be adapted for large-scale deployment. The RRAP

³⁰ 'The Program' (no date) *Reef Restoration and Adaptation Program*. Available at: https://gbrrestoration.org/the-program/ (Accessed: 3 October 2022).
 ³¹ 'Interventions' (no date) *Reef Restoration and Adaptation Program*. Available at:

<u>https://gbrrestoration.org/interventions/</u> (Accessed: 30 July 2022). ³² TechEthos D2.2, *supra* note 4





This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

²⁹ Talberg, A., Thomas, S. and Wiseman, J. (2018) 'A scenario process to inform Australian geoengineering policy', *Futures*, 101, pp. 67–79. Available at: <u>https://doi.org/10.1016/j.futures.2018.06.003</u>.

has released a report on modelling of large-scale deployment (over the entire GBR),³³ which, as McDonald et al. (legal scholars not connected to RRAP) write, 'in the long term could result in large-scale manipulation of the planetary environment'.³⁴ The RRAP describes MCB as 'one of the most innovative and promising large-scale interventions being investigated by the R&D program'.³⁵

Beginning in March 2020, a team led by Dr Daniel Harrison at Southern Cross University, Coffs Harbour, New South Wales, began field-testing of MCB technology. This was 'the world's first field trial of marine cloud brightening',³⁶ although the RRAP argues that similar technology is already used to increase precipitation for the purposes of hydroelectric power generation in New South Wales and Tasmania.³⁷ No peer-reviewed publications from the MCB study are available at time of writing, thus it is difficult to assess how far the project has progressed.

The test involves pumping seawater through a mist machine mounted to the stern of a ship, spraying salt microparticles into the air. These merge with low-lying clouds, acting as nuclei for vapour condensation, raising clouds' albedo. The RRAP uses spray nozzles developed for the Marine Cloud Brightening Project (MCBP), based at the University of Washington, Seattle.³⁸ This latter group, led by Professor Robert Wood, is researching MCB for the purposes of climate engineering.³⁹

The RRAP is internationally significant from a regulatory perspective, given that the level of ethics approval to which SRM projects have been obliged to submit themselves elsewhere in the world has thus far acted as a barrier to analogous projects being initiated. For comparison, Harvard University's SCoPEx project, which planned to release no more than 2kg of calcium carbonate into the stratosphere above Sweden in 2021, in order to 'improve knowledge of some aspects of stratospheric aerosol physics and chemistry relevant to solar geoengineering' was instructed by its independent Advisory Committee to suspend planned flights until the committee can make a final recommendation on the basis of 'robust public engagement in Sweden that is broadly inclusive of indigenous populations'.⁴⁰ This suspension included planned equipment test flights that would not release any aerosols.

To secure funding for the full-scale project, the RRAP was obliged to submit a Regulatory Assessment.⁴¹ The findings of the regulatory assessment will be discussed below, under **Proposals for Dedicated Law**; **Environmental Law**.

³⁸ O'Neill, S. (2022) 'Solar Geoengineering to Reduce Global Warming—The Outlook Remains Cloudy', *Engineering*, 9, pp. 6–9. Available at: <u>https://doi.org/10.1016/j.eng.2021.12.005</u>.

³⁹ 'Marine Cloud Brightening Project | Robert Wood' (no date). Available at:

⁴¹ Fidelman, P et al. (2019) 'Reef Restoration and Adaptation Program: Regulatory Assessment Findings. A report provided to the Australian Government by the Reef Restoration and Adaptation Program'. Available at: https://gbrrestoration.org/wp-content/uploads/2020/09/T2-Regulatory-Assessment-Findings3.pdf



³³ Harrison, D *et al.* (2019) *Reef Restoration and Adaptation Program: Environmental Modelling of Large Scale Solar Radiation Management. A report provided to the Australian Government by the Reef Restoration and Adaptation Program.* Available at: <u>https://gbrrestoration.org/wp-content/uploads/2020/09/T14-Environmental-Modelling-of-Large-Scale-SRM_v3.03-3.pdf.</u>

³⁴ McDonald, J. *et al.* (2019) 'Governing geoengineering research for the Great Barrier Reef', *Climate Policy*, 19(7), p. 804.

³⁵ 'Cooling by cloud brightening' (2020) *Reef Restoration and Adaptation Program*, 30 September. Available at: <u>https://gbrrestoration.org/program/cooling-by-cloud-brightening/</u> (Accessed: 3 October 2022).

³⁶ Tollefson, J. (2021) 'Can artificially altered clouds save the Great Barrier Reef?', *Nature*, 596(7873), pp. 476–478. Available at: <u>https://doi.org/10.1038/d41586-021-02290-3</u>.

³⁷ 'Cooling by cloud brightening' (2020) *Reef Restoration and Adaptation Program*, 30 September. Available at: <u>https://gbrrestoration.org/program/cooling-by-cloud-brightening/</u> (Accessed: 3 October 2022).

https://faculty.washington.edu/robwood2/wordpress/?page_id=954 (Accessed: 3 October 2022).

⁴⁰ *Keutsch Group at Harvard - Statements* (no date). Available at:

https://www.keutschgroup.com/scopex/statements (Accessed: 3 October 2022).

CDR

Australia has active policy on CDR through the Emissions Reduction Fund (ERF). This scheme allows individuals and firms to earn Australian Carbon Credit Units (ACCUs) for every tonne of CO₂ equivalent (tCO₂e) 'avoided' or 'stored'.⁴² The scheme thus actively promotes both abatement and CDR.

As noted by the Department for Climate Change, Energy, the Environment and Water,⁴³ ACCUs can be granted for projects involving:

- new technology
- upgrading equipment
- changing land or business practices to improve productivity or energy use
- changing the way vegetation is managed to store more carbon

Eligible projects include those associated with:

- vegetation management
- agriculture
- energy consumption
- waste
- transport
- coal and gas production
- industrial processes

The ERF thus envisages that new CDR schemes coming onstream will be eligible for carbon credits, including those involving innovative technologies.

In addition to compensating net-negative emissions per unit, via the ERF, Australia has also awarded advanced R&D funding for CDR. From 1st March to 29th March 2021, the Australian government opened the *Carbon Capture, Use and Storage Development Fund*. This funding round offered grants of up to AU\$25 million for CCS projects.⁴⁴ One of the successful projects was a CDR by Direct Air Capture project: A*spiraDAC*, which was awarded AU\$4 million.⁴⁵

AspiraDAC, which describes itself as the 'world's first solar powered Direct Air Capture facility', announced its launch in a release dated June 2022.⁴⁶ *ApiraDac* is a wholly owned subsidiary of *Corporate Carbon*, a company which manages net-negative emissions development to generate income via the ERF.⁴⁷ It plans to capture and sequester 1 tonne of carbon per day, using 'modular and scalable solar powered units', in partnership with Southern Green Gas, which developed and licensed the technology. It expects 'production and deployment' of the modules by 'the end of 2022'.⁴⁸

⁴⁴ Carbon Capture Use and Storage Development Fund | business.gov.au (2022). Available at: https://business.gov.au/grants-and-programs/carbon-capture-use-and-storage-development-fund

https://www.aspiradac.com/dac-company-launches-with-first-purchases-from-frontier (Accessed: 3 October 2022).

⁴⁸ 'Solar-powered carbon capture technology leading the way – Southern Green Gas' (no date). Available at: <u>https://www.southerngreengas.com.au/solar-powered-carbon-capture-technology-leading-the-way/</u> (Accessed: 3 October 2022).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

⁴² Emissions Reduction Fund - DCCEEW (no date). Available at: <u>https://www.dcceew.gov.au/climate-change/emissions-reduction/emissions-reduction-fund</u> (Accessed: 3 October 2022).

⁴³ Ibid.

⁽Accessed: 3 October 2022).

⁴⁵ Ibid.

⁴⁶ DAC company launches with first purchases from Frontier (2022) AspiraDAC. Available at:

⁴⁷ What we do (no date) Corporate Carbon. Available at: <u>https://www.corporatecarbon.com.au/what-we-do</u> (Accessed: 3 October 2022).

Australian law on Climate Engineering

Australia does not have domestic laws that explicitly govern CE research, field-testing or deployment.⁴⁹

The ERF, which actively promotes CDR, was established by the *Carbon Credits (Carbon Farming Initiative)* Act 2011(Cth),⁵⁰ and the Carbon Credits (Carbon Farming Initiative) Rule 2015 (Cth).⁵¹

The Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth) regulates offshore CCS at a national level (which has implications for DACCS and BECCS).⁵² There are state-level statutes for onshore CCS, for example the Greenhouse Gas Storage Act 2009 (Qld).⁵³

Proposals for dedicated law

SRM

The RRAP conducted a Regulatory Assessment, which was published in September 2019.⁵⁴ The report focused mainly on the regulatory system surrounding protection of the Great Barrier Reef, which is governed by the *Great Barrier Reef Marine Park Act 1975 (Cth)* in Commonwealth law,⁵⁵ and by *the Marine Parks Act 2004* (Qld.) in state law.⁵⁶

The report authors write, '[T]he Great Barrier Reef regulatory system is robust, but it may not be entirely fit for purpose for some of the interventions proposed by RRAP'.⁵⁷ It makes several proposals for changes to the regulatory system. Most of these are interventions at the level of policy, for instance, increasing funding for the Great Barrier Reef Marine Park Authority (the Commonwealth agency responsible for administering the marine protected area).

The report does make 9 proposals for reform in the regulatory sphere. These proposals are mainly focused on transparency, most importantly, 'establish[ing] a public register with all application and reporting documents related to funded projects' and 'requir[ing] annual (or biennial) performance audits'.⁵⁸ It is not stated whether the authors take these recommendations to require legal reforms, or whether they can simply, for instance, be included in the funding agreements between projects and the relevant agencies. The report authors also call for a streamlining of existing regulations, for instance, to avoid a situation in which the same application for a permission under existing environmental

⁵⁵ Great Barrier Reef Marine Park Act 1975 (Cth). Available at:

 ⁵⁷ Fidelman, P *et al.* (2019), supra note 40, p.2
 ⁵⁸ Ibid., p.25



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

⁴⁹ McDonald, J. *et al.* (2019) 'Governing geoengineering research for the Great Barrier Reef', *Climate Policy*, 19(7), p. 805. Available at: <u>https://doi.org/10.1080/14693062.2019.1592742</u>.

⁵⁰ Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth). Available at:

https://www.legislation.gov.au/Details/C2022C00257 (Accessed: 3 October 2022).

⁵¹ Carbon Credits (Carbon Farming Initiative) Rule 2015 (no date). Attorney-General's Department. Available at: <u>https://www.legislation.gov.au/Details/F2022C00403/Html/Text</u>,

http://www.legislation.gov.au/Details/F2022C00403 (Accessed: 3 October 2022).

⁵² Offshore Petroleum and Greenhouse Gas Storage Act 2006 (no date). Attorney-General's Department. Available at: <u>https://www.legislation.gov.au/Details/C2022C00175/Html/Volume 1</u>,

http://www.legislation.gov.au/Details/C2022C00175 (Accessed: 3 October 2022).

⁵³ Greenhouse Gas Storage Act 2009 - Queensland Legislation - Queensland Government (no date). Available at: https://www.legislation.gld.gov.au/view/html/inforce/current/act-2009-003 (Accessed: 3 October 2022).

⁵⁴ Fidelman, P *et al.* (2019) *Reef Restoration and Adaptation Program: Regulatory Assessment Findings. A report provided to the Australian Government by the Reef Restoration and Adaptation Program.* Available at: <u>https://gbrrestoration.org/wp-content/uploads/2020/09/T2-Regulatory-Assessment-Findings3.pdf</u> (Accessed: 30 July 2022).

https://www.legislation.gov.au/Series/C2004A01395 (Accessed: 3 October 2022).

⁵⁶ Marine Parks Act 2004 (Qld). Available at:

https://www.legislation.qld.gov.au/view/html/inforce/current/act-2004-031 (Accessed: 3 October 2022).

regulation must be approved by multiple agencies.⁵⁹ Apparently, then, the report does not explicitly call for new legislation.

McDonald, McGee, Brent and Burns (2019) argue that a national governance framework for SRM is necessary.⁶⁰ This framework, they argue, should build on the Oxford Principles,⁶¹ the Asilomar Principles,⁶² and Hubert's Code of Conduct for Geoengineering Research.⁶³ For instance, in order to operationalise the stipulation of the Oxford Principles that CE should be regulated as a public good, funding agreements should require intellectual property related to CE research to be made public, or at least 'be allocated so as to safeguard access to the benefits of the research'.⁶⁴ They also recommend systems of public oversight to ensure public support for outdoor testing.⁶⁵ The authors stress that their main intention is not to make specific governance recommendations, but simply to highlight the importance of having a governance framework of some kind.⁶⁶

CDR

McCormack, McDonald and Brent (2020) offer three governance priorities for legal reform, 'to minimize trade-offs and maximise co-benefits for NETs [negative emission technologies] and conservation'.⁶⁷ These are:

- 3. 'Prioritize nature-based solutions that align with climate-adaptive conservation goals and could be implemented immediately under existing Australian legal frameworks'
- 4. 'Laws for assessing net proposals should operate within a framework of landscape-scale and cross-sectoral land-use planning, to facilitate an appropriate balance between competing climate-governance goals.'
- 5. 'Legal instruments should provide clear guidance, for example in the form of statutory decisionmaking principles, on trade-offs between nets and conservation goals'⁶⁸

The authors' focus in this national legal case study is land-based CDR rather than, for example, DACCS.

Responsibility for enforcement

Responsibility for the enforcement of regulation relevant to CE research and deployment would fall to a wide range of agencies depending on the nature of the intervention under consideration.

The agencies with most relevant competence are:

⁶⁸ Ibid. p.126



⁵⁹ Ibid.

⁶⁰ McDonald, J. *et al.* (2019) 'Governing geoengineering research for the Great Barrier Reef', *Climate Policy*, 19(7), p. 808. Available at: <u>https://doi.org/10.1080/14693062.2019.1592742</u>.

⁶¹ Rayner, S. *et al.* (2013) 'The Oxford Principles', *Climatic Change*, 121(3), pp. 499–512. Available at: <u>https://doi.org/10.1007/s10584-012-0675-2</u>.

⁶² Asilomar Scientific Organizing Committee (2010) *The Asilomar Conference Recommendations on Principles for Research into Climate Engineering Techniques.* Climate Institute Washington DC. Available at: http://www.climateresponsefund.org/images/Conference/finalfinalreport.pdf.

⁶³ Hubert, A.-M. (2021) 'A Code of Conduct for Responsible Geoengineering Research', *Global Policy*, 12(S1), pp. 82–96. Available at: <u>https://doi.org/10.1111/1758-5899.12845</u>.

⁶⁴ McDonald, J. *et al. supra* note 60'. p.808

⁶⁵ Ibid. ⁶⁶ Ibid.

⁶⁷ McCormack, P.C., McDonald, J. and Brent, K.A. (2020) , *Climate Law*, 10(2), pp. 123–150. Available at: https://doi.org/10.1163/18786561-01002001.

• The Department for Climate Change, Energy, the Environment and Water⁶⁹

This Commonwealth Government department was established by the incoming Albanese administration on 1 July 2022, integrating functions previously held by the Department of Agriculture, Water and the Environment, and the Department of Industry, Science, Energy and Resources. It took on the portfolio of the Federal Environment Minister, who bears statutory responsibility for granting permissions under the Environment Protection and Biodiversity Act (1999) (See **3.1 Environmental law**, below).

• The Clean Energy Regulator⁷⁰

An independent statutory authority,⁷¹ formally a sub-department of the Department for Climate Change, Energy and Water. Among other duties, it is responsible for administering the Emissions Reduction Fund, including issuing ACCUs for accredited carbon abatement and removal schemes, and the purchase of ACCUs through the auction system.

• National Petroleum Safety and Environmental Management Authority⁷²

Although primarily responsible for regulating offshore oil drilling, this statutory agency⁷³ is also responsible for approving and enforcing the environment plans that every CCS project must submit. It has powers to issue remedial directions to CCS titleholders and operators.⁷⁴

• The Great Barrier Reef Marine Park Authority⁷⁵

A Commonwealth agency established by the *Great Barrier Reef Marine Park Act 1975 (Cth)*, responsible for (among other things), granting permissions for activities in the vicinity of the GBR, including the airspace 915m above the marine park. CE activities, including MCB, Ground-based Albedo Modification (GBAM), Ocean Fertilization (OF) and most other CE interventions would require permits if carried out in the protected area.

• Local government

Responsible for planning approvals.

Significant legal cases

This study did not identify significant legal cases involving climate engineering in Australia.

⁶⁹ EPBC Act - Frequently asked questions - DCCEEW (no date). Available at:

<u>https://www.dcceew.gov.au/environment/epbc/publications/factsheet-epbc-act-frequently-asked-</u> <u>questions</u> (Accessed: 3 October 2022).

⁷⁰ Clean Energy Regulator Clean Energy Regulator - Home (no date). Available at: https://www.cleanenergyregulator.gov.au/ (Accessed: 3 October 2022).

⁷¹ Established under *Clean Energy Regulator Act 2011 (Cth)*. Available at:

https://www.legislation.gov.au/Series/C2011A00163. (Accessed 25 October 2022)

⁷² Home | NOPSEMA (no date). Available at: <u>https://www.nopsema.gov.au/</u> (Accessed: 3 October 2022).

⁷³ Established under *Offshore Petroleum and Greenhouse Gas Storage Act 2006*. Available at: http://www.legislation.gov.au/Details/C2022C00175 (Accessed: 3 October 2022).

⁷⁴ How Australian laws and regulations affect carbon capture and storage | White & Case LLP (no date). Available at: <u>https://www.whitecase.com/insight-our-thinking/how-australian-laws-and-regulations-affect-</u>carbon-capture-and-storage (Accessed: 3 October 2022).

⁷⁵ *Homepage | gbrmpa* (no date). Available at: <u>https://www2.gbrmpa.gov.au/</u> (Accessed: 3 October 2022).



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Current debates and future policy and/or legal developments

The Albanese government, which assumed office 23rd May 2022, has signalled a higher level of attention to climate policy than previous administrations, for example by quickly moving to update Australia's Nationally Determined Contribution under the Paris Agreement - committing to emissions reductions of 43% of 2005 levels by 2030, compared to a previous target of 26-28%.⁷⁶ This may point to a greater willingness to engage with the issue of CE regulation, although it is still early in the government's tenure.

On 1 July 2022, the Albanese government announced it was launching a review of the ACCU scheme, which has been severely criticised by experts (see **4.3 Analysis of Gaps, Challenges and Future Trends** – **Climate Law**, below). This review, to be conducted by a panel lead by former Chief Scientist Professor Ian Chubb, is expected to present its report to the government by 31 December 2022.⁷⁷

The terms of reference for the review state that it will 'advise on the integrity of ACCUs issued under the Carbon Credits (Carbon Farming Initiative) Act 2011, with specific reference to whether the scheme's governance structure is fit for purpose[...], whether the scheme's settings and legislative requirements are appropriate to ensure good governance and confidence in scheme integrity[...]; whether the scheme has appropriate transparency including whether and how reporting and publication of data could be improved[...]'.⁷⁸ The terms state that the review will give consideration to recent claims raised about the Human Induced Regeneration, Carbon Capture and Storage, Avoided Deforestation, and Landfill Waste Gas methods – in other words, it will respond directly to the strong criticism the scheme has received.

The second part of the review's remit is to assess 'the broader impacts of activities incentivised under Australia's carbon crediting framework'.⁷⁹ The concerns under this heading include assessing whether the scheme incentivises behaviour which negatively impacts regional communities, the local environment, or agricultural productivity, assessing the extent to which ACCU schemes support positive outcomes for biodiversity and the participation of first nation people, wider non-carbon benefits more broadly, and whether ACCUs are suitable for use in the Climate Active scheme. This latter scheme allows traders to certify products as carbon neutral, in part by purchasing accredited carbon offsets.⁸⁰

06/Australias%20NDC%20June%202022%20Update%20%283%29.pdf

⁷⁷ Independent Review of ACCUs | Ministers (2022). Available at:

⁸⁰ *How it works | Climate Active* (no date). Available at: <u>https://www.climateactive.org.au/what-climate-active/how-it-works</u> (Accessed: 3 October 2022).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

⁷⁶ Australian Government Department of Industry, Science, Energy and Resources. (2022) *Australia's Nationally Determined Contribution Communication 2022*. Available at: https://unfccc.int/sites/default/files/NDC/2022-

https://minister.dcceew.gov.au/bowen/media-releases/independent-review-accus (Accessed: 3 October 2022).

⁷⁸ Ibid.

⁷⁹ Ibid.

3. Domain-specific legal issues

This section examines the legal implications of climate engineering in an Australian context with respect to specific legal domains with a high socio-economic impact. The legal domains covered include human rights law, environmental law, and climate change law.

The three domains of law identified are demarcated to a large extent by Australia's obligations under international treaties. However, those treaty obligations figure into domestic law in ways that may have specific implications for the regulation of CE in Australia, which may not apply in other jurisdictions. This section will thus begin by setting out Australia's relevant obligations under international law with respect to each of the three legal domains, before clarifying how they are operationalised in the Australian context. It will then go on to highlight any gaps, challenges and future trends that are specific to each of the three domains.

A comprehensive analysis of the implications of international and EU human rights law, environmental law and climate change law for CE research and deployment is conducted under **TechEthos D4.1**. Therefore, this section will focus on how the relevant standards in international law are expressed in the domestic context. It will go on to highlight which of these standards, as expressed in domestic law, interact with the domestic policy sphere in the most relevant ways, and finally, set out some areas in which the law may not embody potential best practice.

3.1 Human rights law

Australia is a signatory to the 7 core human rights treaties that comprise the international human rights system:

- International Covenant on Civil and Political Rights (ICCPR)⁸¹
- International Covenant on Economic, Social and Cultural Rights (ICESCR)⁸²
- Convention on the Rights of the Child (CRC)⁸³
- Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)⁸⁴
- Convention on the Rights of Persons with Disabilities (CRPD)⁸⁵

https://treaties.un.org/doc/Publication/UNTS/Volume%202515/v2515.pdf (accessed 24 October 2022)



D4.2

⁸¹ UN General Assembly, *International Covenant on Civil and Political Rights*, 16 December 1966, United Nations, Treaty Series, vol. 999, p. 171, available at:

https://treaties.un.org/doc/Publication/UNTS/Volume%20999/v999.pdf (accessed 24 October 2022) ⁸² UN General Assembly, *International Covenant on Economic, Social and Cultural Rights*, 16 December 1966, United Nations, Treaty Series, vol. 993, p. 3, available at:

https://treaties.un.org/doc/Publication/UNTS/Volume%20993/v993.pdf (accessed 24 October 2022) ⁸³ UN General Assembly, *Convention on the Rights of the Child*, 20 November 1989, United Nations, Treaty Series, vol. 1577, p. 3, available at:

https://treaties.un.org/doc/Publication/UNTS/Volume%201577/v1577.pdf (accessed 24 October 2022) ⁸⁴ UN General Assembly, *Convention on the Elimination of All Forms of Discrimination Against Women*, 18 December 1979, United Nations, Treaty Series, vol. 1249, p.1, available at:

https://treaties.un.org/doc/Publication/UNTS/Volume%201249/v1249.pdf (accessed 24 October 2022) ⁸⁵ UN General Assembly, *Convention on the Rights of Persons with Disabilities*, 13 December 2006, United Nations, Treaty Series, vol. 2515, p.3, available at:

D4.2

- Convention on the Elimination of All Forms of Racial Discrimination (CERD)⁸⁶
- Convention against Torture (CAT)⁸⁷

It has also endorsed the non-binding Universal Declaration of Human Rights (UDHR),⁸⁸ and the Declaration on the Rights of Indigenous Peoples (UNDRIP).⁸⁹⁹⁰

As already noted, because Australia follows legal dualism, international treaties must be ratified in domestic law to have force in Australian courts. Thus, rights are instantiated through a diverse range of legislative instruments.

Of the protections enshrined in the international human rights system, the ones arguably of most relevance for the regulation of CE are the following (see **TechEthos D4.1: International and EU Legal Analysis**):

- The right to enjoy the benefits of scientific progress, as enshrined in ICESCR Article 15
- The right to information, as enshrined in ICCPR Article 19
- The right to participate in public affairs, ICCPR Article 26
- Indigenous Rights, as enshrined in UNDRIP

As noted, Australia is a jurisdiction with no explicit constitutional Bill of Rights. Unlike the UK, which similarly lacks a codified constitution which serves as the main repository of rights, Australia also lacks a Human Rights Act, a single statute that gives effect to its obligations under international treaties (primarily, in the UK case, the European Convention of Human Rights). Many human rights in Australian law are implicit, created by the fact that there exist no statutory prohibitions that would curtail the relevant freedoms. As such, these international treaties are not always explicitly transposed into Australian law via specific instruments. However, some of the above rights are created and enforced by domestic legislation. For instance, the *Human Rights (Parliamentary Scrutiny) Act 2011 (Cth)* provides that all new legislation must be assessed for compliance with obligations under the international human rights treaties.⁹¹

The Australian Capital Territory and the State of Queensland do have Human Rights Acts which have force in the courts of that territory and that state. *Human Rights Act 2004 (ACT)* follows the ICCPR and the ICESCR, translating the rights contained within those treaties into territory law. The *Human Rights Act 2019 (Queensland)* protects a list of 23 fundamental rights. *The Charter of Human Rights and Responsibilities Act 2006* (Victoria) protects 20 fundamental rights, loosely based on the ICCPR.

The Australian Human Rights Commission is the statutory body responsible for overseeing and reporting on the protection of human rights in Australia. It was established by the *Australian Human Rights Commission Act 1986 (Cth).*⁹² Although it has no legal power to enforce human rights by sanctioning human rights violations, it monitors Australian policy and the judgements of Australian

⁹⁰ Human Rights in Australia | Australian Human Rights Commission (no date). Available at:

https://humanrights.gov.au/our-work/education/human-rights-australia (Accessed: 3 October 2022).

⁹² Australian Human Rights Commission Act 1986 (Cth). Attorney-General's Department. Available at: https://www.legislation.gov.au/Details/C2017C00143 (Accessed: 3 October 2022).



⁸⁶ UN General Assembly, Convention on the Elimination of All Forms of Racial Discrimination, 13 December 2006, United Nations, Treaty Series, vol. 2515, p.3, available at:

https://treaties.un.org/doc/Publication/UNTS/Volume%202515/v2515.pdf (accessed 24 October 2022) ⁸⁷ UN General Assembly, *Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment*, 10 December 1984, United Nations, Treaty Series, vol. 1465, p.85, available at: https://treaties.un.org/doc/Publication/UNTS/Volume%201465/v1465.pdf (accessed 24 October 2022)

 ⁸⁸ UN General Assembly, Universal Declaration of Human Rights, 10 December 1948, 217 A (III)
 ⁸⁰ UN General Assembly, Universal Declaration of Human Rights, 10 December 1948, 217 A (III)

⁸⁹ UN General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples : resolution / adopted by the General Assembly*, 2 October 2007, A/RES/61/295

⁹¹ Human Rights (Parliamentary Scrutiny) Act 2011, s. 8 (3). Attorney-General's Department. Available at: https://www.legislation.gov.au/Details/C2016C00195 (Accessed: 3 October 2022).

courts, presenting recommendations for new legislation if the current legislative landscape has proven inadequate in upholding Australia's international obligations under human rights treaties.⁹³ It is responsible for preparing Australia's submissions to Australia's UPR Working Group, which prepares Australia's report as part of the Universal Period Review process under the UN Human Rights Council.⁹⁴

It also provides a conciliation service for people who have suffered alleged human rights abuse, for example, discrimination by employers, landlords, merchants, etc., on the grounds of protected characteristics including race, sex (including sexual orientation and gender identity), disability, age and political opinions.⁹⁵ Conciliation is voluntary on the part of the complainant and the respondent, and disputes are settled by mutual agreement. Disputes can be referred to court if conciliation is unsuccessful.⁹⁶

Victoria, Queensland and the Australian Capital Territory each have Human Rights Commissions which monitor adherence to their human rights acts. Other states typically have a Discrimination Commission which fulfills a similar role.⁹⁷

3.1.1 Current Human Rights framework and its implications for CE

The current human rights framework has some ability to regulate CE research and deployment. Arguably, of most significance in the Australian context is the domain of indigenous rights, and relatedly, the right to participate in public affairs (ICCPR Art.25). Although the UNDRIP is non-binding, in Australia indigenous rights are considered to be an integral part of the human rights system, for instance, the *Human Rights Commission Act 1986* (Cth) establishes a dedicated Aboriginal and Torres Strait Islander Social Justice Commissioner, who is responsible for the promotion of human rights in relation to these groups.⁹⁸ With respect to indigenous rights, the right of indigenous peoples to 'participate in decision-making in matters which would affect their rights'⁹⁹ is especially salient of CE regulation in Australia, given Australia's acknowledgement of native title claims (see below).

While the right to participate public affairs principally protects the right to participate in elections,¹⁰⁰ it also 'covers all aspects of public administration, and the formulation and implementation of policy at international, national, regional and local levels'.¹⁰¹

Also significant is the right to enjoy the befits of scientific progress (ICESCR Art.15), which includes the protection of scientific freedom.¹⁰² The 2009 *Venice Statement on the Right to Enjoy the benefits of Scientific Progress and its Applications*, which was developed by in order to 'clarify the normative content of the right to enjoy the benefits of scientific progress'¹⁰³under the auspices of UNESCO, interprets the

¹⁰⁰ICCPR, *supra* note 81, Article 25(b)

https://www.aaas.org/sites/default/files/VeniceStatement_July2009.pdf (Accessed 25 October 22)



⁹³ Ibid., Section 11(j-p)

⁹⁴ Australia's Second Universal Periodic Review on human rights | Australian Human Rights Commission (no date). Available at: <u>https://humanrights.gov.au/our-work/rights-and-freedoms/australias-second-universal-periodic-review-human-rights</u> (Accessed: 26 October 2022).

 ⁹⁵ Australian Human Rights Commission Act 1986 (Cth) supra note 92, Part IIB Division 1
 ⁹⁶ Ibid. Section 46PO(1)

⁹⁷ Odering, J. (no date) *Library Guides: Human Rights Law: Australia*. Available at:

https://unimelb.libguides.com/human_rights_law/national/australia (Accessed: 3 October 2022).

⁹⁸ Australian Human Rights Commission Act 1986 (Cth) supra note 93, Part IIA

⁹⁹ UNDRIP *supra* note 89, Art.18

¹⁰¹Committee on Civil and Political Rights. (1996) *General Comment No. 25: The right to participate in public affairs, voting rights and the right of equal access to public service*, CCPR/C/21/Rev.1/Add/7. ¹⁰²ICESCR, *supra* note 82, Article 15(3)

¹⁰³ Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Venice Statement), July 2009. Available at:

right as itself implying a public participation requirement, with 'equal access and participation of all public and private actors'.¹⁰⁴

Thus indigenous rights, the right to participate in public affairs, and the right to enjoy the benefits of scientific progress can viewed as mutually supportive, and implying requirements for public participation in, and democratic oversight of, scientific projects with the potential to affect the interests of many parties (see **TechEthos Deliverable 4.1 §4.3.7, §4.3.4**).¹⁰⁵

Because of the RRAP, the Great Barrier Reef has become an important site for current and potential future CE research and activity. The Great Barrier Reef is an extremely important site from an indigenous rights perspective, meaning CE activity is likely to interact with, and indeed is already interacting with the body of human rights law that relates to indigenous peoples in this area, and in significant ways.

The Australian Government recognises Aboriginal Australians and Torres Strait Islanders as traditional owners of the Great Barrier Reef, with different indigenous peoples claiming title to regions of ocean around the reef.¹⁰⁶ To define its approach to the recognition of these claims, following a public consultation exercise involving traditional reef owner groups, in 2019 the GBRMPA published the report *Aboriginal and Torres Strait Islander Heritage Strategy for the Great Barrier Reef Marine Park*.¹⁰⁷ The strategy document identified 3 major outcomes: keep heritage strong, keep heritage safe, and keep heritage healthy. The first of these entails empowering traditional owners, respecting them in all GBRMPA business, and promoting understanding of indigenous values. The second involves incorporating heritage values into the GBRMPA's policy, planning, permitting and compliance processes. Finally, the third outcome involves cooperative management of marine resources through Traditional Use of Marine Resource Agreements.

This means, in principle, that the Australian state regards adequate recognition of indigenous rights to require representation of indigenous communities in the processes of issuing permissions for activities of all kinds on the GBR, which would include CE field testing such as the tests being conducted under the RRAP. Similar constraints would apply to any other CE activities conducted on lands of which indigenous people had traditional title claims. 40% of Australia's land mass has some indigenous land rights over it.¹⁰⁸ This has implications, for instance, for CCS, as geological storage sites may fall within these lands. It may also have implications for land-based CDR such as BECCS.

The Native Title Act (1993) (Cth) recognises the preexisting rights over land of the indigenous peoples of Australia. It states that the content of these rights is to be determined by the traditional laws and customs of the relevant indigenous group.¹⁰⁹ This means it is impossible to determine the content of indigenous claims over lands and coastal waters without careful consultation with the groups in question. The Act implies that native title only includes surface rights of access, use and utilisation rather than rights over the subsurface geological pore space that would be used for geological

¹⁰⁵Santiago, Nicole *et al.* (2022) *D4.1 Analysis of international and EU law and policy for the goverance of climate engineering, neurotechnologies, and digital extended reality.* Available at: <u>www.techethos.eu.</u>
 ¹⁰⁶ *Reef Traditional Owners | gbrmpa* (no date). Available at: <u>https://www2.gbrmpa.gov.au/learn/traditional-owners/reef-traditional-owners</u> (Accessed: 3 October 2022).

- ¹⁰⁷ Authority, G.B.R.M.P. (2019) *Aboriginal and Torres Strait Islander Heritage Strategy for the Great Barrier Reef Marine Park*. Great Barrier Reef Marine Park Authority. Available at:
- https://elibrary.gbrmpa.gov.au/jspui/handle/11017/3425 (Accessed: 3 October 2022).

¹⁰⁸ National Indigenous Australians Agency. *Land and Housing*. Available at:

https://papers.ssrn.com/abstract=3495334 (Accessed: 3 October 2022).

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¹⁰⁴Ibid., Art.13(a)

https://www.niaa.gov.au/indigenous-affairs/land-and-housing (Accessed: 3 October 2022).

¹⁰⁹ Crommelin, M. (2018) 'Tenure, Title and Property in Geological Storage of Greenhouse Gas in Australia', in *Carbon Capture and Storage: Emerging Legal and Regulatory Issues*. Ian Havercroft, Richard Macrory and Richard Stewart (eds.). Rochester, NY: Hart Publishing. Available at:

storage.¹¹⁰ Rights over subsurface features, including geological storage, are held in reserve by the States and Territories.¹¹¹ Nevertheless, it is possible that surface activity related to geological storage may interfere with traditional access and use.

3.1.2 Human Rights: Gaps, challenges and future trends for CE

Overall Framework

The Australian human rights framework itself has been subject to important challenges, calling into question its fitness for responding to emerging fields of law like CE regulation. The Australian Human Rights Commission notes, 'Australia does not have a national Human Rights Act. This means that many core human rights and freedoms may not be adequately protected and promoted at a federal level and there is an inconsistent level of protection across Australian states and territories.'¹¹² An example of an area of human rights law where inconsistencies in the application of human rights across the Commonwealth could present challenges is in determining the scope of indigenous customary rights over land, watercourses, and marine areas. This could present ambiguities with respect to the validity of permissions for CE activities in these areas.

Australian Human Rights Commission carried out a "National Conversation" (a public inquiry with a public deliberation component) into what new legislation is needed on matters pertaining to human rights, and to comply with international agreements.¹¹³ It has published one issues paper¹¹⁴ and three discussion papers, ¹¹⁵ ¹¹⁶ ¹¹⁷ as well as a periodic report to the UN Human Rights Council, ¹¹⁸ and a position paper¹¹⁹ which contain recommendations for human rights reforms in Australia.

Among the various recommendations contained in the discussion papers, most relevant for CE is the recommendation that 'an agreement or framework for negotiations with Indigenous Australians should be developed, to recognise and address the structural inequalities brought about by colonisation and

¹¹⁴ Australian Human Rights and Commission (2019) *Free and equal: An Australian conversation on human* rights Issues Paper 2019. Available at:

¹¹⁹ Australian Human Rights Commission (2021) Free and Equal: A reform agenda for federal discrimination laws (2021). Available at: https://humanrights.gov.au/our-work/rights-and-freedoms/publications/free-andequal-reform-agenda-federal-discrimination-laws (Accessed: 30 July 2022).





¹¹⁰ Native Title Act 1993 (Cth), Section 223. Available at:

https://www.legislation.gov.au/Details/C2017C00178 (Accessed: 3 October 2022); see also Crommelin, M. (2018), supra note 70.

¹¹¹ Crommelin, M. (2018), *supra* note 70, p.4

¹¹² Australia's human rights framework (no date) Victorian Equal Opportunity and Human Rights Commission. Available at: https://www.humanrights.vic.gov.au/legal-and-policy/australias-human-rights-framework/ (Accessed: 3 October 2022).

¹¹³ Free and Equal: An Australian conversation on human rights | Australian Human Rights Commission (no date). Available at: https://humanrights.gov.au/free-and-equal (Accessed: 3 October 2022).

https://humanrights.gov.au/sites/default/files/document/publication/ahrc free equal issues paper 2019 final.pdf.

¹¹⁵ Australian Human Rights and Commission (2019) FREE AND EQUAL An Australian conversation on human rights 2019. Discussion Paper: Priorities for federal discrimination law reform. Available at:

https://humanrights.gov.au/our-work/rights-and-freedoms/publications/discussion-paper-prioritiesfederal-discrimination-law.

¹¹⁶ Australian Human Rights Commission (2019) *Discussion Paper: A model for Positive Human Rights Reform*. Available at: https://humanrights.gov.au/our-work/rights-and-freedoms/publications/discussion-papermodel-positive-human-rights-reform-2019.

¹¹⁷ Australian Human Rights Commission (2019) *Discussion Paper: Ensuring effective national accountability* for human rights. Available at: https://humanrights.gov.au/sites/default/files/19.10.14 discussion paperensuring effective national accountability final.pdf.

¹¹⁸ National report submitted in accordance with paragraph 5 of the annex to Human Rights Council resolution 16/21, A/HRC/WG.6/37/AUS/1 (2020). Available at: https://documents-ddsny.un.org/doc/UNDOC/GEN/G20/356/20/PDF/G2035620.pdf?OpenElement.

the consequences of past and ongoing injustices'.¹²⁰ This recommendation, if enacted, would importantly constrain future CE research. The RRAP, for instance, has included indigenous groups in its research to some extent: Usop Drahm, a traditional owner of the Manduburra Aboriginal Land and Sea Country, was invited to take part in the MCB project's expeditions.¹²¹ This was presumably pursuant to the GBRMPA's strategy document, which requires indigenous values to be incorporated into GBRMPA policy. The recommended changes to human rights law would give a more definite structure to this kind of involvement, potentially allowing for a range of indigenous voices to influence policy in a more substantive way.

Political Participation, Indigenous Rights and CCS

Legal scholar Michael Crommelin argues, 'the [legal] provisions for underground disposal of carbon dioxide are meagre indeed' and therefore that CCS regulation in Australia 'rests precariously on the uncharted divide between public and private law'.¹²² The fact that geological resources are owned by the state but exploited for private gain under a licence 'gives reign to the ingenuity' of the officials drafting these licences.¹²³ There is therefore arguably a need for new legislation to more carefully circumscribe the relationship between publicly held land rights and private enterprise.

It is here proposed that such legislation would be an appropriate site to strengthen the participatory rights of indigenous groups in determining whether proposed geological storage projects interfere with native title claims. It may also arguably be an important opportunity to strengthen rights to public participation more broadly, as CCS with geological storage raises wider questions of national interest concerning the use of Australia's shared public heritage, and how benefits from it are to be distributed.

Strengthening Scientific Freedom

There are also ongoing challenges in Australia with respect to scientific freedom and the human right to benefit from scientific research.¹²⁴ A May 2022 editorial in the leading scientific journal *Nature* strongly criticised the Australian state for failing to live up to the standard embodied by the Haldane principle.¹²⁵ This principle was introduced into British policymaking by the Haldane report in 1918, and has legal influence on the Commonwealth countries that still bear ties to the British legal system. The principle states that decisions regarding the award of research grants should not be taken by ministers or central government, but should instead as far as possible be determined by researchers themselves, through peer review. As *Nature* reports, on at least 4 occasions since 2001, Ministers have directly intervened to block the award of grants to research projects by the Australian Research Council (ARC). In the most recent instance, the government issued a statement explaining the decision of the Minister in question, Stuart Robert, to intervene, stating the Minister 'believes those rejected do not demonstrate value for taxpayers' money nor contribute to the national interest'.¹²⁶

¹²⁶ Nogrady, B. (2022) 'Australian researchers push to end politicians' power to veto grants', *Nature* [Preprint]. Available at: <u>https://doi.org/10.1038/d41586-022-00682-7</u>.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

¹²⁰ Australian Human Rights Commission (2019) *Discussion Paper: A model for Positive Human Rights Reform.*, p. 19. Available at: <u>https://humanrights.gov.au/our-work/rights-and-freedoms/publications/discussion-paper-model-positive-human-rights-reform-2019</u>.

¹²¹ Mandubarra Aboriginal Land and Sea Inc., Regional Advisory and Innovation Network (RAIN) Pty Ltd (2020). *Mandubarra Sea Country Cultural Values: 2019-2020 mapping project*. Report. Mandubarra Aboriginal Land and Sea Inc. Available at: https://elibrary.gbrmpa.gov.au/jspui/handle/11017/3815 (Accessed: 3 October 2022).

¹²² Crommelin *supra* note 109. p.14

¹²³ Ibid.

¹²⁴ ICESCR, *supra* note 82, Article 15(b)

¹²⁵ 'Australia must abolish law that allows politicians to veto research grants' (2022) *Nature*, 605(7908), pp. 7–7. Available at: <u>https://doi.org/10.1038/d41586-022-01200-5</u>.

These incidents led to concerns in the research community, and in 2018 a legislative bill was tabled in parliament to amend the law to prevent ministerial interference.¹²⁷ On 9 February 2022, the Senate referred the amendment to the Senate Education and Employment Legislation Committee for inquiry. The inquiry opened for submissions in February 2022 and presented its report in March 2022.¹²⁸ Although there was widespread agreement in the submissions that a change to the law to place limits on ministerial interference was warranted, the committee noted a difference of opinion as to whether the role of ministers should be limited to setting an overall strategy for research funding, or whether ministerial discretion should serve as a 'necessary accountability mechanism'.¹²⁹ The committee recommended the bill to limit ministerial interference in research funding not be passed.¹³⁰ This of course means that the concerns of members of the research community who called for legal changes have not been addressed.

There is no indication that any of the documented cases of interference relate to CE funding. Indeed, the committee's report notes that interference seems mainly to relate to the blocking of funds for the arts, humanities and social sciences, rather than STEM.¹³¹ However, given interference concerns have not been addressed, research funding in Australia remains open to direct ministerial intervention. There is a case to be made that this may undermine the integrity of the approval process for CE research projects moving forward. The election of the Albanese government presents an opportunity for Australia's Parliament to return to the question of the integrity of academic research in the face of political interference.

3.2 Environmental law

Environmental law in Australia is split between major pieces of Commonwealth law, and a wide range of piecemeal regulations at a state/territory and local level. The central piece of Commonwealth-level environmental legislation in Australia is the *Environment Protection and Biodiversity Conservation Act* (1999) (Cth) (EPBCA). This statute regulates 9 matters of national environmental significance:¹³²

- World heritage
- National heritage
- Wetlands of international importance
- Migratory species protected under international agreements
- Listed threatened species and ecological communities
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mines)
- Water resources, in relation to coal seam gas development and large coal mining development

Any group or individual proposing a project which may affect any of these matters of national environmental significance is required by the EPBCA to submit a proposal to the regulator.¹³³ The

 ¹³² Environment Protection and Biodiversity Conservation Act 1999 (Cth), ss 12-24E. Available at: https://www.legislation.gov.au/Details/C2016C00777 (Accessed: 3 October 2022).
 ¹³³ Ibid. s. 68.



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¹²⁷ Australian Research Council (Ensuring Research Independence) Bill 2018 (Cth)

¹²⁸ Senate Education and Employment Legislation Committee (2022) *Australian Research Council Amendment (Ensuring Research Independence) Bill 2018.* p.23, Available at:

https://parlinfo.aph.gov.au/parlInfo/download/committees/reportsen/024901/toc_pdf/AustralianResearch CouncilAmendment(EnsuringResearchIndependence)Bill2018.pdf

¹²⁹ Ibid. p.28

¹³⁰ Ibid. p.28

¹³¹ Ibid. p.10

proposal is then published for public comment.¹³⁴ The Minister then decides whether a further Environmental Impact Assessment (EIA) is required, taking the public comments into account.¹³⁵

At a Commonwealth level, the relevant department - now the Department of Climate Change, Energy, the Environment and Water - can enforce the provisions of the EPBCA through a range of powers, including demanding mandatory environmental audits, issuing infringement notices, civil and criminal prosecution, and remediation orders to redress damage.¹³⁶ Primary responsibility for enforcement of environmental standards, however, lies with the states and territories, which each have their own environmental regulatory authority.¹³⁷ The states/territories each define environmental impact according to their own standards, whereas the Commonwealth Government only has authority to conduct assessments in relation to the 9 matters of national environmental significance.¹³⁸

With respect to international environmental law, Australia is a party to the UN Convention on Biological Diversity (CBD).¹³⁹ It is also a signatory to the London Protocol on Ocean Dumping.¹⁴⁰ It is also a party to the UNESCO World Heritage Convention¹⁴¹ - this treaty is of particular significance for Australian environmental law, as the Great Barrier Reef is listed as a UNESCO World Heritage Site.¹⁴² Unlike the EU, Australia is a not a signatory to the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention).¹⁴³

3.2.1 Current environmental law framework and its implications for CE

The EPBCA would likely be triggered for a wide range of potential CE interventions. Marine CE that affected marine protected areas would be subject to EIA approval. Land-based CDR like BECCS has the potential to damage biodiversity,¹⁴⁴ and thus risks impacting threatened species and ecological communities in a way that may be restricted by the EPBCA. Any resulting prohibitions or demands for changes to project plans would however have to be imposed on a case-by-case basis, and would have no blanket effect on CE in general or any particular CE intervention as such. 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol) (entry into force 24 March 2006) ATS 11 With respect to international law, Australia is a state party to the CBD, which has addressed the issue of CE through two non-binding decisions. The first, in

¹³⁹ Convention on Biological Diversity (CBD) (entered into force 29 December 1993) 1750 UNTS 79, 31 ILM 818. Available at: https://treaties.un.org/doc/Publication/UNTS/Volume%201760/v1760.pdf (Accessed 25 October 2022)

¹⁴⁰ 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol) (entry into force 24 March 2006) ATS 11. Available at:

https://www.cdn.imo.org/localresources/en/OurWork/Environment/Documents/PROTOCOLAmended2006. pdf (Accessed 25 October 2022)

https://whc.unesco.org/document/191197 (Accessed 25 October 2022).

¹⁴² UNESCO World Heritage Centre (no date) *Great Barrier Reef*, UNESCO World Heritage Centre. Available at: https://whc.unesco.org/en/list/154/ (Accessed: 3 October 2022).

¹⁴³ Convention on Environmental Impact Assessment in a Transboundary Context, Espoo, Finland, 25 February 1991. Available at: https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-

<u>4&chapter=27&clang=_en</u> (Accessed: 3 October 2022).

¹⁴⁴ Tech Ethos D2.2



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¹³⁴ Ibid. s.74 (3)

¹³⁵ Ibid. s.101

¹³⁶ Ibid., s 458; s 464; s 475, s 480A, s 481

¹³⁷ Thomson Reuters Practical Law (no date) *Environmental law and practice in Australia: overview, Practical* Law. Available at: http://uk.practicallaw.thomsonreuters.com/1-502-

^{8908?}transitionType=Default&contextData=(sc.Default)&firstPage=true (Accessed: 3 October 2022). ¹³⁸ EPBC Act - Frequently asked questions - DCCEEW (no date). Available at:

https://www.dcceew.gov.au/environment/epbc/publications/factsheet-epbc-act-frequently-askedquestions (Accessed: 3 October 2022).

¹⁴¹ UN Educational, Scientific and Cultural Organisation (UNESCO), *Convention Concerning the Protection of* the World Cultural and Natural Heritage, 16 November 1972. Available at:

2010, commits state parties to ensure that: '[N]o climate-related geo-engineering activities that may affect biodiversity take place, until there is an adequate scientific basis on which to justify such activities and appropriate consideration of the associated risks for the environment and biodiversity and associated social, economic and cultural impacts, with the exception of small scale scientific research studies that would be conducted in a controlled setting'.¹⁴⁵ A 2016 amendment to the decision reaffirmed the commitments of the 2010 decision and called upon parties to provide more information regarding what concrete steps they had taken pursuant to that decision. It also noted that 'more transdisciplinary research and sharing of knowledge among appropriate institutions is needed', including regarding 'regulatory options'.¹⁴⁶

The London Protocol on Ocean Dumping (1996) bans all dumping of waste and other materials into the ocean, with the exception of a small number of materials listed in annex to the protocol, which may be granted permission to be dumped.¹⁴⁷ The Protocol entered into force in 2006. An amendment (2013) to the London Protocol contains a prohibition on Marine Geoengineering.¹⁴⁸ However, according to legal scholar Jesse Reynolds, the prohibition in this amendment only applies to ocean fertilization.¹⁴⁹ Moreover, it has not yet entered into force.¹⁵⁰

Australia is party to the 1976 Convention on the Prohibition of Military or any other Hostile use of Environmental Modification Techniques (ENMOD Convention). While this treaty does not prohibit environmental modification for non-hostile purposes, it does contain an obligation to 'facilitate... the fullest possible exchange of scientific and technological information on the use of environmental modification techniques for peaceful purposes'.¹⁵¹

3.2.2 Environmental Law: Gaps, challenges and future trends for CE

Ocean Dumping

According to Brent, McDonald, McGee and Gogarty, the legal status of forms of CE which involve placing matter into Australian waters is ambiguous, with the potential for them to be considered illegal.¹⁵² Such activities would include 'marine sunscreening' (placing a reflective polymer film on the ocean surface to reflect sunlight, a form of GBAM) and ocean fertilization – both of which are being carried out under RRAP – although it would not include MCB. The London Protocol is implemented into Australian domestic law via the *Environment Protection (Sea Dumping) Act 1981* (Cth) (SDA).¹⁵³ This act creates a general prohibition on the dumping of wastes in Australian waters, or from Australian vessels, or from

¹⁵³ Environmental Protection (Sea Dumping) Act 1981 (Cth). Available at: <u>https://www.legislation.gov.au/Series/C2004A02478</u> (Accessed: 3 October 2022).



¹⁴⁵ UNEP/CBD/COP/DEC/X/33, Available at: <u>https://www.cbd.int/decisions/cop/10/33/8</u> (Accessed: 3 October 2022)

¹⁴⁶ UNEP/CBD/COP/DEC/13/14, available at: <u>https://www.cbd.int/decisions/cop/13/14</u> (Accessed: 3 October 2022)

¹⁴⁷ 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol) *supra* note 139, Art.4.

¹⁴⁸2013 Amendment to the London Protocol to Regulate the Placement of Matter for Ocean Fertilization and other Marine Geoengineering Activities (Not in Force)

¹⁴⁹ Reynolds, J. (2018). International Law. In M. B. Gerrard & T. Hester (Eds.), *Climate Engineering and the Law* (pp. 57–153). Cambridge & New York: Cambridge University Press.

¹⁵⁰ Article 21(3) of the Protocol provides that '[a]n amendment shall enter into force for the Contracting Parties which have accepted it on the sixtieth day after two-thirds of the Contracting Parties shall have deposited an instrument of acceptance of the amendment with the Organization. Thereafter the amendment shall enter into force for any other Contracting Party on the sixtieth day after the date on which that Contracting Party has deposited its instrument of acceptance of the amendment.'

¹⁵¹ Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques.18 May 1977: *1108 U.N.T.S. 151*, arts. HI(3), V(1).

¹⁵² Brent, K. et al. (2018) 'Carbon dioxide removal geoengineering', Australian Law Journal, 92(10), pp. 830– 838.

vessels loaded in Australia. The dumping of certain 'controlled materials' (listed in Annex 1 of the London Protocol) may be allowed if a permit is granted by the federal Environment Minister, in accordance with the procedure in Annex 2 of the London Protocol.¹⁵⁴

Given that neither the materials used for ocean fertilisation nor those used for marine sunshields are listed in Annex 1 as controlled materials, a general prohibition on the dumping into the sea of these materials applies. To allow these activities, the materials would need to be listed as 'controlled materials' under annex 1. Thus, if placing these materials in the ocean qualifies as 'dumping', then the act prohibits this activity and does not allow for the Minister to grant a permit. According to the authors, whether placing materials into the ocean qualifies as dumping under the Act is determined by whether it qualifies as dumping under the Protocol.¹⁵⁵ Thus, the authors note, '[w]hether ocean fertilisation field-testing or implementation can legally take place in Australia will therefore depend on how it is characterised under the London Protocol, although it is the Environment Minister who must make this determination.'¹⁵⁶

The authors further argue that because of the Protocol's broad definition of 'dumping', the Minister would (or should) likely judge that the intentional placing of matter into the ocean that has a potential to harm the marine environment does qualify as dumping under the protocol, and thus the SDA.¹⁵⁷ As noted, the 2013 amendment to the protocol prohibits placing matter in the ocean for CE, but contains an exception for 'legitimate scientific research'.¹⁵⁸ However, because the amendment is not legally in force, the authors argue that it has no effect on the SDA, therefore the Minister may not consider scientific research as an exception to the prohibition on ocean dumping in Australian law.

As noted, the 2013 Amendment to the London Protocol specifically prohibits marine CE, in particular, ocean fertilization, but the amendment has not yet come into force.¹⁵⁹ McDonald, McGee, Brent and Burns argue, 'Australia was one of three countries to propose the 2013 amendment [to the London Protocol on Ocean Dumping] and should therefore be expected to act in accordance with its spirit, regardless of whether the amendment has become binding international law.'¹⁶⁰ They note that despite this, Australia has made no attempt to explicitly apply the amendment's prohibition on Ocean Fertilization in state law (barring the ambiguity discussed in the previous paragraph).

As signing up to the amendment clearly represents a stated international commitment on the part of Australia (along with the other signatories to the amendment), introducing a prohibition on Ocean Iron fertilization into domestic law is arguably warranted as a direction for future legal intervention. Given the content of the amendment, this could be either an outright ban, or a condition that requires international agreement that Ocean Fertilization is scientifically justified before any proposal can proceed.

Fragmented regulations for BECCS and CCS

Brent, McDonald, McGee and Dogarty argue that the EPCBA has some capacity to place legal limits on the implementation of BECCS projects, for instance on the grounds that protected species may be present at the proposed sites.¹⁶¹ However, they point out that 'if the impacts of individual BECCS initiatives were considered on a case-by-case basis, there is a real risk of serious impacts on listed

¹⁶¹ Brent, K. *et al.* (2018) 'Carbon dioxide removal geoengineering', *Australian Law Journal*, 92(10), p.835.



¹⁵⁴ Ibid., section 19

¹⁵⁵ Brent *et al.* (2018), *supra note 97*, p.836

¹⁵⁶ Ibid.

¹⁵⁷ Ibid. p.837

 ¹⁵⁸ 2013 Amendment to the London Protocol to Regulate the Placement of Matter for Ocean Fertilization and other Marine Geoengineering Activities (Not in Force), Annex 4, s1.3
 ¹⁵⁹ Ibid., Art. 6 Bis

¹⁶⁰ McDonald, J. *et al.* (2019) 'Governing geoengineering research for the Great Barrier Reef', *Climate Policy*, 19(7), pp. 801–811. Available at: <u>https://doi.org/10.1080/14693062.2019.1592742</u>.

biodiversity overall, since the EPBC Act does a poor job of accounting for cumulative impacts'.¹⁶² They suggest instead that moving forward a 'programmatic approach' to planning and approval is to be preferred.¹⁶³ For instance, the regulator should be able to make an assessment of the environmental impact of a national BECCS program rather than being limited to assessing project proposals on a case-by-case basis.

Interpretation of term 'geoengineering' for CBD compliance

The 2010 and 2016 CBD decisions are regarded by some commentators as establishing a moratorium on geoengineering deployment globally.¹⁶⁴¹⁶⁵ However, as "decisions" under the convention they are non-binding and the text itself does not define any legal obligation.¹⁶⁶ Whether or not the decision is binding, however, it is 'highly persuasive'¹⁶⁷ in establishing a norm that geoengineering is internationally controversial and that parties should not allow open-air testing without international agreement as to its scientific merits. The RRAP does not assess its own activities as being subject to the CBD decision, because their aim is not the reversal of global climate change, but only local shielding of the reef. Campaign groups opposed to CE regard this as 'rebranding'¹⁶⁸ and 'geoengineering in disguise'¹⁶⁹.

Future trends: Samuel Review

A statutory review of the EPBCA, led by Professor Graeme Samuel AC, commenced on 29 October 2019. The review closed for submissions in April 2020 and the review presented its final report in October 2020.¹⁷⁰ The review set out to analyse the operation of the act and determine whether its objects had been achieved. The final report made 38 recommendations for reform.¹⁷¹ The most important of these was a call to introduce a suite of legally enforceable National Environmental Standards, which prescribe that all activities contribute to national environmental outcomes. Among the standards recommended is a National Environmental Standard for indigenous engagement and participation in decision-making. It recommended state governments shift their focus from individual project approvals to a focus on clear outcomes, implementing national and regional environmental plans.

The then-Minister for Agriculture, Water and the Environment, Sussan Ley, issued the Government's Response, 'A Pathway for Reforming National Environmental Laws', in June 2021.¹⁷² The government

¹⁶³ Ibid.

https://epbcactreview.environment.gov.au/resources/final-report.

¹⁷¹ Ibid. p.26

https://www.dcceew.gov.au/sites/default/files/documents/pathway-reforming-national-environmentallaw.pdf.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

¹⁶² Ibid.

¹⁶⁴ Tollefson, J. (2010) 'Geoengineering faces ban', *Nature*, 468(7320), pp. 13–14. Available at: <u>https://doi.org/10.1038/468013a</u>.

¹⁶⁵ Walsh, B. (2010) 'Climate: Why It's a Mistake to Ban Research on Geoengineering', *Time*, 2 November. Available at: <u>https://science.time.com/2010/11/02/climate-why-its-a-mistake-to-ban-research-on-geoengineering/</u>

 ¹⁶⁶ Scott, K.N. (2012) 'International Law in the Anthropocene: Responding to the Geoengineering Challenge', *Michigan Journal of International Law*, 34, p. 309.
 ¹⁶⁷ Ibid., p.333

¹⁶⁸ *Geoengineers test planetary engineering scheme in Australia* (no date) *Friends of the Earth Australia*. Available at: <u>https://www.foe.org.au/geoengineers test planetary engineering scheme in australia</u> (Accessed: 30 July 2022).

¹⁶⁹ Geoengineers test risky planetary engineering scheme in Australia | ETC Group (2020). Available at: https://www.etcgroup.org/content/geoengineers-test-risky-planetary-engineering-scheme-australia (Accessed: 30 July 2022).

¹⁷⁰ Samuel, G (2020) *Independent Review of the EPBC Act – Final Report.* Canberra: Department of Agriculture, Water and the Environment. Available at:

¹⁷² Commonwealth of Australia, A pathway for reforming national environmental law. (2021). Canberra: Department of Agriculture, Water and the Environment,. Available at:

has committed to implementing many of the review's recommendations, however at time of writing no reforms have been passed. The *Environment Protection and Biodiversity Conservation Amendment (Standards and Assurance) Bill 2021* began passage through parliament but lapsed at dissolution in July 2022 and has not been reintroduced.¹⁷³

3.3 Climate change law

Australia is a state party to the United Nations Framework Convention on Climate Change (UNFCCC), and a signatory to the 2015 Paris Agreement, which commits parties to holding the increase in global average temperature 'well below' 2C, and to 'pursue efforts' to hold the temperature rise below 1.5C.¹⁷⁴ It also requires signatories to submit Nationally Determined Contributions, committing to national mitigation targets, and to submit reports detailing the actions taken in pursuit of those targets.¹⁷⁵

Until September 2022, Australia had no domestic legislation transposing Australia's commitment under the Paris Agreement into domestic law. That changed with the introduction of *the Climate Change Bill 2022 (Cth)*, which received Governor-General's assent 13 September 2022. In addition to codifying Australia's greenhouse gas emissions reduction targets of 43% reduction from 2005 levels by 2030 and net zero by 2050,¹⁷⁶ the act requires the minister to table an annual climate change statement to parliament, requires the Climate Change Authority (the statutory body responsible for monitoring Australia's contribution to greenhouse gas emissions and its progress towards mitigations targets) to advise the minister in relation to the annual statement and future targets, and provides for periodic reviews of the operation of the act.¹⁷⁷

According to the London School of Economics Grantham Institute, Australia has 12 Commonwealth laws on Climate Change. They are:¹⁷⁸

- Climate Change Bill 2022 See above
- Climate Energy Finance Corporation Act 2012 (last amended 2020) Establishes the Clean Energy Finance Corporation.
- Building Energy Efficiency Disclosure Act 2010 (last amended 2017) Establishes a national scheme to require the disclosure of information about the energy efficiency of large office buildings at point of sale/lease

¹⁷⁸ Grantham Institute on Climate Change and the Environment (no date). *Australia - Climate Change Laws of the World*. Available at: <u>https://www.climate-laws.org/geographies/australia</u> (Accessed: 30 July 2022).



¹⁷³ Environment Protection and Biodiversity Conservation Amendment (Standards and Assurance) Bill 2021 Available at:

https://www.aph.gov.au/Parliamentary Business/Bills LEGislation/Bills Search Results/Result?bId=r6683 (Accessed: 3 October 2022).

¹⁷⁴ Conference of the Parties, Adoption of the Paris Agreement (Paris Agreement) (entry into force 4 November 2016) 3156 UNTS, Art.2(1)(a). Available at:

https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf. (Accessed 25 October 2022)

¹⁷⁵ Conference of the Parties, Adoption of the Paris Agreement (Paris Agreement) (entry into force 4 November 2016) 3156 UNTS, Art.4(2)-(3). Available at:

https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf. (Accessed 25 October 2022)

 ¹⁷⁶ A Bill for an Act to set out Australia's greenhouse gas emissions reductions targets, to provide for annual climate change statements, to confer advisory functions on the Climate Change Authority, and for related purposes 2022 (Cth) (Climate Change Bill). Available at: <u>http://www.legislation.gov.au/Details/C2022B00055</u> (Accessed: 3 October 2022), s 10.
 ¹⁷⁷ Ibid.

- National Greenhouse and Energy Reporting Act 2007 (last amended 2017) Establishes the legislative framework for the National Greenhouse and Energy Reporting scheme, a single national reporting framework for information about greenhouse gas emissions. It provides that corporations that pass an annual threshold must submit annual reports to the Clean Energy Regulator.
- Australian Renewable Energy Agency Act 2011 (last amended 2017) Establishes the Australian Renewable Energy Agency, which provides funding for and promotes renewable energy projects.
- Building Energy Efficiency Disclosure Act 2010 (Act No. 67 of 2010)(Last amended 2016) Requires energy efficiency information to be provided when a commercial building of a certain meterage is put up for sale or lease.
- Renewable Energy (Electricity) Act 2000 (last amended 2016) Establishes a scheme to issue certificates for the generation of renewable electricity from accredited sources. Requires certain purchasers to surrender a specified number of certificates for electricity that they acquire during a year.
- Carbon Farming Initiative Amendment Bill 2014 Establishes the Emissions Reduction Fund. Amends the Carbon Credits (Carbon Farming Initiative) Act 2011, which established the ACCU scheme in relation to accredited offset projects.
- Greenhouse and Energy Minimum Standards Act 2012 Establishes minimum standards that apply to the supply and commercial use of products that either use energy or affect the energy used by another product.
- Climate Change Authority Act 2011 Establishes the Climate Change Authority, which is obliged to conduct reviews under other acts, and conduct research about matters relating to climate change.
- Australian National Registry of Emissions Units Act 2011 Establishes the National Registry of Emissions Units.
- Offshore Petroleum and Greenhouse Gas Storage Act 2006 Provides a regulatory framework for petroleum exploration and recovery. Designates a joint authority for each offshore area which is responsible for implementing the act.

3.3.1 Current climate law framework and its implications for CE

The Climate Bill 2022 does not mention CE, nor does it have any direct impact on policy or regulation in relation to CE. However, as the bill reflects Australia's commitments under the Paris Agreement, it is possible that the content of that agreement has implications for the interpretation of Australia's commitments to certain means of pursuing mitigation targets. The Paris Agreement commits parties to 'achiev[ing] a balance between anthropogenic emissions by sources *and removals by sinks* [emphasis added]'.¹⁷⁹ This can be interpreted as an implied commitment to pursuing negative emissions strategies. The UNFCCC framework may also have implications for SRM regulation. Kerryn Brent argues that at-

¹⁷⁹ Conference of the Parties, Adoption of the Paris Agreement (Paris Agreement) (entry into force 4 November 2016) 3156 UNTS, Art.4(1) (emphasis added). Available at: <u>https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf</u>.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

scale deployment of SRM for CE is incompatible with the UNFCCC.¹⁸⁰ Jesse Reynolds, however, takes the opposite view, arguing that SRM could be consistent with all relevant international treaties.¹⁸¹

As already suggested, the area of existing climate law of most significance for CE in Australia is the body of law governing the ERF, given this scheme directly promotes CDR. The most popular method for generating ACCUs under the ERF has been Human-Induced Regeneration (HIR). This method allows landowners to earn ACCUs for the regeneration of native forests.¹⁸². As McIntosh et al. note, '[a]s of November 2021, HIR projects accounted for 32% of all registered ERF projects, 27% of all issued Australian carbon credit units (ACCUs) and more than 50% of all ACCUs contracted through the ERF purchasing scheme, worth approximately \$1.5-1.6 billion'.¹⁸³ As a form of afforestation/reforestation, in principle (properly managed), HIR is a form of CDR.

3.3.2 Climate Law: Gaps, challenges and future trends for CE

ERF: Carbon Accounting Concerns

The ERF has been the object of damning criticism because of 'serious integrity issues',¹⁸⁴ with a high proportion of ACCUs being awarded for schemes that do not represent 'real' or 'additional' abatement – that is to say, the claim that the emissions have been reduced is either false, or abatement would have occurred anyway in the absence of the schemes in question. These carbon accounting concerns were serious enough that a team lead by Professor Andrew MacIntosh (ANU), formerly head of the government's Emissions Reductions Assurance Committee, called the ERF 'environmental and taxpayer fraud'.¹⁸⁵

In response to the concerns raised about additional abatement, the Emissions Reduction Assurance Committee (ERAC) commissioned a report from AnalytEcon Pty Ltd (the Beare and Chambers Report), published in late 2021. This report concluded that the ERF had indeed generated an increase in woody forest cover in the areas stated.¹⁸⁶ However, MacIntosh et al. argue that the Beare and Chambers report suffered from a flawed methodology which effectively allowed for the counting of areas as new forest cover which should not qualify under the terms of the ERF.¹⁸⁷

Rather than faulting individual participants in the ERF scheme, Macintosh et al. argue that there are systemic faults with the operation of the ERF.¹⁸⁸ They claim that 'the issues have arisen because of a focus on delivering large volumes of credits at a low cost for polluters'.¹⁸⁹ They argue for reform of the system, to ensure that ACCUs are only awarded if (i) there is high confidence in the counterfactual, that

 ¹⁸⁸ Andrew Macintosh *et al.* (2022) *Fixing the integrity problems with Australia's carbon market Fixing the Integrity Problems with Australia's Carbon Market.* Australian National University. Available at: https://law.anu.edu.au/sites/all/files/erf - problems and solutions final 6 april 2022.pdf.
 ¹⁸⁹ Ibid.



¹⁸⁰ Brent, K.A. (2021) 'Solar Geoengineering Is Prohibited under International Law', in A. Zahar and B. Mayer (eds) *Debating Climate Law*. Cambridge: Cambridge University Press, pp. 274–284. Available at: https://doi.org/10.1017/9781108879064.021.

¹⁸¹ Reynolds, J.L. (2021) 'Solar Geoengineering Could Be Consistent with International Law', in A. Zahar and B. Mayer (eds) *Debating Climate Law*. Cambridge: Cambridge University Press, pp. 257–273. Available at: https://doi.org/10.1017/9781108879064.020.

¹⁸² Macintosh, A. *et al.* (2022) 'The ERF's Human-induced Regeneration (HIR): What the Beare and Chambers Report Really Found and a Critique of its Method'. The Australian National University Canberra. ¹⁸³ Ibid.

¹⁸⁴ Andrew Macintosh et al. (2022) Fixing the integrity problems with Australia's carbon market Fixing the Integrity Problems with Australia's Carbon Market. Australian National University. Available at: <u>https://law.anu.edu.au/sites/all/files/erf - problems and solutions final 6 april 2022.pdf</u>. ¹⁸⁵ Ibid.

¹⁸⁶ Beare, S., Chambers, R. (2021) *Human induced regeneration: A spatiotemporal study*. AnalytEcon Pty Ltd, Berry, NSW

¹⁸⁷ Macintosh et al. (2022) supra note 181, p.16

reductions would not have occurred anyway without the credited schemes, (ii) we are able to accurately measure the relevant emissions and removals, and (iii) it is easy to distinguish the effects of the abatement activity on emissions and removals from those associated with natural variability.¹⁹⁰

As already noted, a public inquiry (the Chubb review) has been launched into the ERF. The terms of reference for the inquiry are expansive, and appear to represent an openness to the criticisms adduced by Mcintosh and his collaborators. There is reason to be hopeful that the inquiry will recommend significant reforms and that the government will be receptive to their implementation.

4. Overview of gaps and challenges

This section highlights the main gaps and challenges identified in the previous sections. Climate Engineering regulation is a complex field that cuts across many different legal domains; this section draws out considerations which have implications across more than one domain.

- As the discussion of the capacity of the EPCBA to regulate technologies like BECCS suggests, a Commonwealth-level governance framework for CE should be seriously considered. Such a framework would help to overcome ambiguities in the application of standards between states/territories, and the exploitation of a lack of clear definition of international norms in domestic law.
- A clear legal definition of CE techniques needs to be developed, which specifies specific practices and processes that fall under the regulatory framework, while also maintaining the flexibility to cover emerging, novel and unforeseen technologies. This would prevent future projects from eluding regulation by interpreting the definition of CE in such a way as to exclude themselves from consideration.
- Public consultation must be a key component of the regulatory approval process. In the Australian context, traditional owners of affected lands and sea-country regions must be afforded a substantive policy-directing role. The stipulation that policy should 'reflect the values' of traditional owners risks leaving space for interpretation of those values to be manipulated by actors other than the indigenous people themselves.
- The content of any national legal framework should itself be informed by public consultation, but consideration should be given to public access to information on geoengineering proposals, and public ownership of intellectual property developed.
- Consideration should be given to ensuring research funding application processes are shielded from ministerial interference, while at the same time ensuring they are subject to democratic oversight and responsive to the public interest.
- Current environmental regulations are not well-suited to evaluating the impact of large-scale interventions or national level policies. Consideration should be given to ensuring environmental impact assessments are able to assess entire policy programmes.
- Geological storage is a public resource which is being allocated with little democratic oversight. Even if the risks to the public for example from seismic effects are low, and even if the chances of emission leakage are similarly low, it would remain the case that the public should have the

¹⁹⁰ Ibid. p.2



opportunity to determine whether it is receiving fair compensation for the use of its common resources. Of course, this consideration must be balanced against the need to promote carbon neutral development, and permitting oil and gas firms to maintain legitimate commercial interests.

- RRAP has also highlighted the concern that, while there is clear provision in the 2013 amendment to the London Protocol to restrict Ocean Fertilisation, the extent to which the protocol constrains other CE techniques that involve placing matter in the ocean, for example potential forms of ground-level albedo modification, is less well understood. Opportunities should be sought to clarify this question, either via domestic law or international law.
- The ACCU scheme remains controversial and there are outstanding questions as to whether it is fit for purpose at all. Consideration should be given to whether new CDR schemes should be incorporated into this controversial scheme, or whether it would be preferable to establish an entirely new framework to ensure integrity and public trust.



5. Conclusion

Australia is an instructive case from an international perspective, given its very advanced position internationally in certain areas of CE policy. It has introduced some innovative regulation in tandem with this advanced development, although regulation has not necessarily kept pace with the fast-moving policy environment.

This study does not claim to be exhaustive. In particular, there is a diffuse body of material on the regulation of CCS, with legal frameworks operating differently across the states and territories, of which it has only been possible to give a very general assessment. Australia is something of a test case for CCS, with the feasibility and effectiveness of CCS across the world being a major factor determining the degree to which continued use of fossil fuels will be compatible with the obligation under international law to keep global average temperature rises below 2C. Thus, there are global lessons to be drawn from the Australian experiment in this sphere.

RRAP is another globally significant experiment which will be instructive to other countries. It provides strong evidence for the widely held view that it is important CE governance frameworks are put in place as soon as possible, either at a national level or internationally, so that governments and wider civil society do not find themselves running to catch up with actors in the research and development community. A clear definition of the kinds of technologies that should activate regulatory oversight needs to be in place as early as possible, to avoid ambiguities of interpretation leading to potential conflicts with civil society.



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