Carbon Capture and Storage:
Taking Action under the Present Law

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Executive Summary

Opportunities that are emerging in New Zealand for carbon capture and storage raise questions about the relevant legal settings. CCS in the form of geological sequestration is a way to reduce emissions of greenhouse gases to the atmosphere, or to remove them from the atmosphere. This report examines those settings and makes recommendations for change and reform, short of an entirely new statute specially for CCS. It examines relevant law and policy relating to environmental management, the Exclusive Economic Zone, Crown minerals, and the Emissions Trading Scheme. It addresses legal questions concerning long-term liability for CCS geological sequestration, property rights, and competitive behaviour. It focuses on two scenarios where existing oil and gas industry installations could be used, "reinjection" where the CO_2 injected derives from natural gas processing on site, and "third-party CO_2" where the CO_2 comes to the installation from elsewhere to be injected. For these scenarios, the report makes recommendations for amendments to statutes, regulations, and policy instruments.

On land, a CCS project requires consent under the RMA. The policy context under the RMA has improved in that the benefits of CCS in reducing GHG emissions can now be taken into account, and so can the Emissions Reduction Plan, the 2050 target and emissions budget under the CCRA. However there are virtually no directions to decision-makers in the relevant policy instruments to have regard for the benefits of CCS as a means of reducing GHG emissions. Adaptive management under the present RMA settings provides limited flexibility and is unlikely to be a satisfactory policy option. There is a procedure under the RMA for a CCS operator to apply for requiring authority status authorize the injection of CO_2 notwithstanding private ownership of land. Offshore, in the coastal marine area under the RMA (out to the twelve-mile limit), the legislation is unclear whether reinjection operations are discretionary or prohibited; third-party CO_2 operations are prohibited. In the EEZ, CCS in both scenarios is a discretionary activity and requires a permit. The policy context in the EEZ is reasonably neutral. In both the coastal marine area and the EEZ the legislation would be more straightforward if changes to the London Dumping Protocol made in 2006 were implemented. As for the New Zealand Emissions Trading Scheme, its general design accommodates CCS as reducing emissions before they are counted or as removal activities, but new regulations are required.

The general conclusion of the report is that relatively specific changes to policy settings and amendments to statutes and regulations, as listed below, would result in a legal regime that would be viable for the early stages of CCS in New Zealand. It would not be ideal in its regulatory comprehensiveness for the protection of public interest, or in terms of investment certainty to encourage corporate investment decisions, but it would provide a path forward for CCS projects.

Summary of Recommendations

(1) Priority Changes

Policy Changes

- A national policy statement for CCS (an NPS-CCS) is made under the RMA, to identify CCS as a matter of national importance, and state objectives and policies for it, such as

recognizing its desirability to meet emissions reduction targets. It would direct decision-makers to have regard to adaptive management options.

- Regional policy statements, regional plans and district plans under the RMA; opportunities are taken to advocate for amendments to recognize and provide for the benefits of CCS in GHG emissions reduction.
- Emissions Reduction Plan under the Climate Change Response Act provides for CCS. The next ERP is due by 31 December 2024.
- Gas Transition Plan under the Emissions Reduction Plan provides for CCS. The Plan is due by 31 December 2023.

Regulations and Similar Instruments

- Resource Management (Network Utility Operations) Regulations 2016 is amended under RMA section 360(1)(e) for a CCS project or work to be declared a network utility operation.
- The Resource Management (Marine Pollution) Regulations 1998 and the Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 are amended, to conform to the London Dumping Protocol, and to classify CCS dumping as a discretionary activity.
- The Climate Change Response Act Schedule 4 is amended by an Order in Council removing the existing definition of CCS as an activity, adding a new and more extensive definition, and bringing it into effect so that CCS becomes an activity in respect of which a person can become a voluntary participant in the NZETS and obtain NZUs for CO_2 sequestered.
- Under the Climate Change Response Act, regulations are made to provide for CCS including long-term sequestration, information requirements, calculation of removals, obligations to surrender NZUs in the event of a leak from sequestration, all to be consistent with the *IPCC 2006 Guidelines*.

Amendments of Acts

- In the RMA and the EEZ Act, the definition of "dumping" is amended by adding CCS to it, in the terms provided for by the 2006 Amendment of the London Dumping Protocol, making it clear that this addition is not subject to any restrictions that may be found in other parts of the definition, and making it clear that it applies to CO_2 from any source.
- EEZ Act: section 59(5), which prevents the positive effects of CCS in reducing GHG emissions from being taken into account, is repealed. The continued presence of this provision in the EEZ Act is clearly an anomaly now that its equivalent in the RMA has been removed, so there is a convincing case for the amendment.
- Natural and Built Environment Bill and Spatial Planning Bill: the progress of these replacements of the RMA through Parliament is monitored to ensure that they do not prejudice CCS, and to take opportunities to improve the new regime.

(2) Changes with Less Priority

Policy Changes

- The New Zealand Coastal Policy Statement under the RMA provides for CCS in the coastal marine area and coastal environment. The NZCPS is revised from time to time in a

process led by the Department of Conservation, but there is no time limit in the RMA by which a revision must take place. There has been no practice of making *ad hoc* amendments to the NZCPS, so this will be difficult before a general revision occurs.

- An EEZ Policy Statement is made under the EEZ Act. No such Statement has been made yet, but the possibility of making one should be explored. Proposing one solely for CCS, is possible, but it is likely to open up arguments for a wide-ranging policy exercise.

Regulations and Similar Instruments

- A National Environmental Standard under the RMA is explored, to accompany an NPS-CCS. Closer investigation of an NPS would show whether rules in an NES are required.

Amendments of Acts

- RMA and EEZ Act: in order to improve the post-closure regulatory regime, in each Act is inserted a power to make regulations, notwithstanding other provisions of the Act, for the post-injection period, authorizing a resource consent to be issued for longer than 35 years, for it to be compulsory for the company to hold it even after injection has ended, and with a range of financial assurance options.
- EEZ Act is amended to allow adaptive management options to be considered to the extent consistent with the London Dumping Protocol, by amending sections 61(3), 61(4), 63, and 64.
- Crown Minerals Act is amended to authorize the Minister to take into account the desirability of CCS associated with Crown Minerals Act operations, notwithstanding the purpose or any other provision of the Act.

Glossary

CCRA	Climate Change Response Act 2002
CCS	Carbon capture and storage
CO_2	Carbon dioxide
GHG	Greenhouse gas
EEZ	Exclusive economic zone
EEZ Act	Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012
NPS	National Policy Statement
NZCPS	New Zealand Coastal Policy Statement
NZETS	New Zealand Emissions Trading Scheme
RMA	Resource Management Act 1991

I. Introduction

This report has been prepared for the Gas Industry Company Ltd in order to assist with its part in developing the Gas Transition Plan that is called for by the *Emissions Reduction Plan* of 2022, as one of the actions to be taken to reach New Zealand's targets and budget:[1]

> Develop a gas transition plan by the end of 2023. This will set out a transition pathway for the fossil gas industry, explore opportunities for renewable gases, and ensure an equitable transition. The gas transition plan will be an input to the energy strategy …

The *Emissions Reduction Plan* also identifies an action of developing an approach for single-firm industries, such as steel and cement, with emissions that are hard to reduce or remove.[2]

A. The Nature of Carbon Capture and Storage

Carbon capture and storage is a method for reducing the emissions of carbon dioxide (CO_2) to the atmosphere. Using chemical engineering techniques, CO_2 can be separated from the exhaust flue gas after burning fossil fuels or biofuels, and from other industrial processes. The CO_2 can then be compressed and transported by pipeline to a location where it can be pumped into a deep geological structure (at least 800 metres below the surface) in which it will stay indefinitely – sequestered. Although this is often referred to as "storage", in truth it is permanent disposal with low probability that the CO_2 will ever emerge back into the atmosphere. Captured CO_2 also has industrial uses, and research efforts are under way in different countries to expand carbon capture, use, and storage – CCUS. Research is also under way into different combustion technologies, and into the direct capture of CO_2 from the atmosphere (DACCS or DACC) and bioenergy with carbon capture and storage (BECCS). Most of these variations depend on geological injection and sequestration, and those are the aspects of the technology that involve the most significant legal issues.

New Zealand climate change action may be possible in the near future by using existing oil and gas facilities to pump CO_2 into geological structures that have held oil and gas (or still do), and into other formations like deep saline aquifers. In some gas processing plants, quantities of CO_2 are separated from raw natural gas and are vented – discharged into the air. Instead it can be reinjected into the gas field from which it came, or injected elsewhere. Carbon dioxide from other sources can be injected and disposed of as well. Two scenarios can be distinguished because they are dealt with differently by the law, especially offshore:

- The "reinjection" scenario: the use of a petroleum installation for CCS for CO_2 removed from the natural gas extracted and processed at the installation;
- The "third-party CO_2" scenario: the use of an petroleum installation for CCS for CO_2 transported by pipeline from elsewhere to the installation for injection.

This report focusses on these possibilities rather than scenarios where entirely new facilities like offshore platforms are built for CCS purposes alone. However many of the legal issues are the same for either kind of facility, and whether the CO_2 comes from gas processing plants or some other source.

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[1] Ministry for the Environment, *Emissions Reduction Plan* (2022) Page 216, Action 11.3.1

[2] *Emissions Reduction Plan* (2022) p 219, Action 1.4.2.

The different stages or periods in the life of a CCS project are identified in the international literature and in this report as:[3]

- resource assessment
- site development
- construction
- operation (during which injection of CO_2 occurs)
- closure (after injection has ceased)
- post-closure period.

The closure period includes decommissioning activities and monitoring of the disposed fluids subsurface. In some regulatory frameworks the closure period ends when the regulatory authority is satisfied that no further active measures are required of the operator; in others, there is also a site closure authorisation that entails a transfer of responsibility for the site from the operator to the state. The closure and post-closure periods can also be referred to together as the post-injection period.

CCS projects share some of the characteristics of other large natural resources or infrastructure projects, but they also have some specific features:

- Long-term nature of the project, in both operations and monitoring phases, and in evaluation of benefits and risks.
- Positive environmental impact outside the project area, on a global scale, in the reduction of GHG emissions.
- Injection of CO_2 is often regarded as the discharge of a pollutant when it is in fact the removal of a pollutant.
- Financial driver is reduction of NZETS obligations rather than providing a public utility or a commercial product.
- Unfamiliarity to the New Zealand public, although internationally there are decades of experience with CCS and its component technologies.

These characteristics must be taken into account in developing the CCS legal and regulatory regime.

B. Full-scale CCS legal regime or options to move forward with limited statutory amendments

A fully-developed legal regime designed specifically for CCS would in all likelihood include the following:[4]

- A system of permits for the exploration and injection stages of CCS with procedures and directions to decision-makers about the matters to be taken into account;
- Clear provision for CCS in the coastal marine area and exclusive economic zone, in accordance with international conventions;
- Vesting of storage rights in the Crown;
- Detailed regulation of injection operations through an approved site plan;

[3] International Energy Agency, *Legal and Regulatory Frameworks for CCUS* (2022) p 55.

[4] B Barton, K Jordan and G Severinsen, *Carbon Capture and Storage: Designing the Legal and Regulatory Framework for New Zealand* (Centre for Environmental, Resources and Energy Law, University of Waikato, 2013); International Energy Agency, *Carbon Capture and Storage: Model Regulatory Framework* (2010), IEA 2022.

- Rules or principles for relationships with other users of the subsurface;
- Provision for pipelines and other transport facilities;
- Transfer of liability for post-injection long-term liability for sequestration;
- Measurement, monitoring and verification obligations;
- Eligibility for credits or reduction of obligations under the NZ Emissions Trading Scheme.

However, this report proceeds on the assumption that a full-scale new Act of Parliament for CCS is unlikely in the short term. It therefore gives its attention to options to move forward with CCS that involve few changes to statutes, if any, but may involve changes to regulations, policies and plans. This approach entails options in the legal and regulatory framework that may be less than perfect, and that organizations will have to take into account in examining the risks and uncertainties that are associated with projects. When CCS becomes established in New Zealand, it will become more important to have a suitable legal regime, that addresses complications such as multiple operators working at different sites with different kinds of CO_2 sources and different sinks.

The result of this approach is a greater focus on the RMA and the EEZ Act than on a tailor-made CCS Act. Those two Acts are the key to obtaining approval for injection of CO_2, and for obtaining the necessary property rights, and this Report turns to them after this Introduction. At the time of writing, new legislation has been introduced in Parliament to replace the RMA.[5] It will produce a very different regime for goals, strategies, and policies in environmental management, but there will be a certain amount of continuity in basic features such as resource consents and designations. A close analysis of these bills is out of the scope of this report, but a few points about them are noted in closing the analysis of the RMA.

C. Nature and Scope of this Report

The report is primarily concerned with legislation and general principles of common law that apply. It does not investigate case law from the courts that may be relevant to decisions for example under the RMA or the EEZ Act, or exactly how the issues under those Acts might be analyzed for a particular project. It concentrates on identifying laws that could prevent CCS, ascertaining necessary or desirable amendments to Acts, regulations, and policy settings.

Te Ao Māori and Māori perspectives are relevant to any question of environmental management or natural resource use in New Zealand. A full consideration of law and policy on CCS will necessitate Māori participation and evaluations of Māori interests and the relationship of Māori with the Crown. Similarly, public input and an informed public opinion are important elements of regulatory design and implementation.[6]

1. Relationship to the 2013 Report

This Report builds on the analysis carried out in *Carbon Capture and Storage: Designing the Legal and Regulatory Framework for New Zealand*[7] in 2013 (the 2013 Report), but it does not

[5] Natural and Built Environment Bill and Spatial Planning Bill, introduced 15 November 2022.

[6] 2013 Report, Chapter 3 in relation to the purpose and principles of a CCS Act, and Chapter 12.

[7] B Barton, K Jordan and G Severinsen, *Carbon Capture and Storage: Designing the Legal and Regulatory Framework for New Zealand* (Centre for Environmental, Resources and Energy Law, University of Waikato, 2013).

revise or repeat all of the research that was done then. Rather, it identifies subsequent developments, and it addresses the opportunities to go ahead with carbon capture and storage (CCS) projects in the short or medium term in order to reduce New Zealand's emissions of greenhouse gases without delay.

The 2013 Report (Table of Contents below) examined how the existing law would apply to a CCS project. It compared this law with emerging international thinking about the elements that were necessary for a successful legal regime to enable CCS to occur and to regulate it properly. It found that there were specific obstacles in New Zealand law, and it found that overall the existing legal framework was unsatisfactory. Chapter 3 stated the case for an entirely new CCS Act. Other chapters laid out the provisions it should contain for property rights, a system of CCS permits, detailed project regulation, etc. It addressed petroleum-related CCS, and EOR, but much of its attention went on stand-alone CCS projects receiving CO_2 from a variety of sources.

***Carbon Capture and Storage: Designing the Legal and Regulatory Framework for New Zealand* (2013): Table of Contents**

While much of the law that was relevant in 2013 is still in place, there have been several significant changes in the law and its operation; there have been small but important changes in the Resource Management Act 1991 (RMA); there is more experience with the application of the RMA to major projects; there is a track record in the administration of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act): there is new health and safety legislation; and there have been substantial changes to the Climate Change Response Act 2002 including the New Zealand Emissions Trading Scheme (NZETS). More generally, there is another decade of experience in CCS and CCS legislation overseas. In New Zealand, there is a new urgency in addressing climate change and reducing greenhouse gas (GHG) emissions; the system of targets, budgets and plans has focussed attention on mitigation action, and the price of New Zealand Units in the NZETS has grown to levels where they are now significant in investment and operational decision-making. In addition, companies are now asking their suppliers, including energy suppliers, about their carbon footprints and emissions under different scopes.

2. Coverage of this Report

For the sake of clarity, some matters that this report does not cover can be identified.

- Use of CO_2 as in CCUS; capture operations.
- International comparative analysis.
- The policy and legislative history of enactments.
- Procedural aspects of applications under the RMA, EEZ Act, etc.
- The content of regional policy statements, regional plans, or district plans under the RMA.
- The new Natural and Built Environment Bill and Spatial Planning Bill.
- Health and Safety at Work Act 2015
- Gas Act 1992 in relation to safety, access, and industry governance.
- Building Act 2004.
- Maritime Transport Act 1994.
- Submarine Cables and Pipelines Protection Act 1966.
- The extended continental shelf or other areas beyond the exclusive economic zone.
- Analysis of international environmental law instruments especially the London Protocol, and accompanying academic literature.
- Coastal occupation.
- Marine and Coastal Area (Takutai Moana) Act 2011.
- Marine transboundary problems.

Geothermal resources may also be relevant to CCS law and policy, but are not addressed here. Significant quantities of CO_2 are dissolved in geothermal water and there is interest in the geothermal power sector in reinjecting it. There may be opportunities to ensure that legal and policy changes make this particular kind of CCS more possible.

3. Terminology

- "Storage" as noted above is something of a misnomer; the objective of CCS is disposal, permanently removing CO_2 from the atmosphere. The term "carbon capture use and storage" is also common but this report does not deal with existing and emerging uses of CO_2, the most difficult legal issues being in injection and disposal.
- "Policy instruments" include policy statements and plans made under the RMA and other statutes. The making of such instruments is sometimes referred to as the strategic level of decision-making in contrast to the issue of specific approvals and consents.
- "Consents" can refer to resource consents under the RMA and marine consents under the EEZ Act. The RMA identifies discharge permits and coastal permits as particular kinds of resource consent. The EEZ Act identifies marine dumping consents and marine discharge consents as kinds of marine consent.
- "Consent authority" is the body responsible for issuing and administering a consent. Regional councils, territorial authorities, and the Environmental Protection Authority (EPA) have roles as consent authorities or marine consent authorities.
- "Petroleum" includes oil and gas, following usage in the Crown Minerals Act 1991.

II. CCS and the RMA

A. Preliminary Points

The Resource Management Act 1991 inevitably plays a significant part in the legal framework for CCS. Under the RMA, territorial authorities exercise control over land use, and regional councils exercise control over discharges of contaminants to land, air, and water, water resources generally, and the coastal marine area or territorial sea, out to the twelve-mile limit. Even if legislation specifically for CCS were enacted, a CCS operator would probably be obliged to obtain RMA approvals for incidental aspects of its operations. On the other hand, if a new CCS-specific Act is only a remote possibility, the RMA becomes central. To foreshadow the discussion below, the act of injecting CO_2 into the subsurface is a discharge of a contaminant to land or water that requires a resource consent under the RMA.

Legislative design for CCS must take the RMA into account even in relation to other Acts like the Crown Minerals Act 1991; as noted below, that Act does not exempt a company from complying with the RMA. So, for example, a reinjection project approved under the Crown Minerals Act by the New Zealand Petroleum and Minerals unit in MBIE would also need to obtain discharge permits under the RMA. The same can be said for the Climate Change Response Act 2002 and other Acts that may be relevant; there are very few exceptions to the application of the RMA.

B. Injection as a Discharge under the RMA

An injection of CO_2 into the subsurface of land will be characterized under the RMA as the discharge of a contaminant into water, or the discharge of a contaminant into land from industrial or trade premises, within the meaning of section 15.[8] To carry it out the operator must apply for a discharge permit (a form of resource consent) from the regional council, although it is possible to make rules in a regional plan or national environmental standard to say that a permit is not required. The decision on granting the application for a discharge permit is guided by the RMA's regime; relevant factors are the Act's purpose and principles, national policy statements, regional policy statements, and plans and strategies under other legislation. A discharge permit can be issued subject to conditions, and its maximum term is 35 years. It is probable that permits must be kept in force during CCS injection, but not after the injection period has ended. (Conditions, national environmental standards and national policy statements are considered in more detail below.)

It is assumed for present purposes that the storage or disposal aspect of CCS, after injection, does not require a resource consent of any kind. In RMA terms, the contaminant (CO_2) has been discharged to land and water, and now forms part of the natural environment, even if its location in the environment is circumscribed by cap rock and other structural features of the geology. One corollary is that an escape of CO_2 from geological sequestration is a movement of material from one part of the environment into another, and is not a discharge of a contaminant into the environment that would require a discharge permit. Another corollary is that a consent authority cannot compel the operator to retain its discharge permit once it has finished with the injection of CO2; it is no longer carrying on an activity that requires a

[8] There are variations on this general rule for specific circumstances, to be found in particular in other parts of s 15 and in ss 15A, 15B and 15C.

resource consent, and, after all, the consent holder has a right to surrender any permit that it holds at any time under section 138. Nor can the consent authority oblige the operator to apply for a renewal consent if the operator is not carrying out any of the activities regulated under Part 3.

C. Difficulties with the RMA Previously Identified

The 2013 Report evaluated many of the difficulties that could be foreseen in applying the RMA and the EEZ Act to CCS operations.[9]

(1) RMA provisions on climate change and renewables
(2) Permit management
(3) Permit term
(4) Continuing long-term regulation of activity
(5) Consistent provisions nationally
(6) Long-term liability
(7) Discharges to water

While some of those difficulties still stand, changes since 2013 have removed some of the greater ones, so that it is now realistic to consider how CCS might be authorized and controlled under the RMA.

The last matter on the list above, discharges to water, can be dealt with straight away. Two sections of the RMA protect water quality by preventing discharges that would have particularly harmful or objectionable results, after reasonable mixing.[10] One of them is any conspicuous change in the colour or visual clarity. Given that the issue is deep injection into a geological formation from which the water should never emerge, a change in the colour or clarity of the water may well be considered irrelevant, so that there are exceptional circumstances that justify the granting of the permit, consistent with the purpose of the RMA. (Underground, it would not be "conspicuous" and the provisions overall seem to be directed to surface waters.) That point of view would be more readily accepted if a national policy statement (NPS) gave clear policy support to CCS. (The benefits of an NPS on CCS are discussed below.) The view would have to be argued in an RMA consent hearing, but the issue should not be a complete barrier to CCS under the RMA; a well-considered application for a CCS project, receiving clear policy support from an NPS, ought not be derailed by these sections.

D. Taking Climate Change into Account under the RMA

1. Effects of a Discharge on Climate Change and the 2020 Amendment

Until recently, provisions in the RMA about climate change posed a potentially insurmountable barrier for CCS projects.[11] Sections 70A and 104E and related sections, in their substance, directed that an RMA decision-maker could not have regard to the effects of a discharge on climate change, both in the making of policies and plans and in the granting of

[9] 2013 Report, Chapter 2 pp 32-38.

[10] RMA ss 70 and 107. The former concerns a rule in a plan that makes a discharge a permitted activity, so it is unlikely to come into play for CCS. The latter concerns discharge permits, and includes the proviso for exceptional circumstances.

[11] 2013 Report, Chapter 2 pages 30-32.

resource consents. It was interpreted to extend to ancillary consents including land use consents issued by territorial authorities, and probably meant that the positive effects of greenhouse gas reductions could only be taken into account in relation to renewable energy projects.[12] This wide effect was probably unintentional; when these sections were included, in 2004, the object was for emissions reductions to be the subject of regulation and policy in a pricing system at the national level, and not at the regional level in the RMA. For CCS their likely effect was that the negative environmental effects of a project had to be weighed carefully, while its single positive effect, mitigating net GHG emissions, could not be put into the balance.[13] We considered that this presented serious difficulties in obtaining approval for CCS projects; it appeared to prevent CCS from occurring in New Zealand.

That barrier has now been removed by amendments that came into force on 30 November 2022, repealing sections 70A, 104E and the related provisions.[14] The consequence is that CCS projects, and other projects that may reduce emissions, can be considered as to both their positive and negative effects on the environment. In respect of resource consents, section 104(1)(a) and (ab) requires the consent authority to have regard to any actual and potential effects on the environment of allowing the activity; it is compulsory to do so.[15] Similarly, at the strategic level, regional councils, territorial authorities, and central government agencies must take into account the positive effects of CCS in making RMA policy statements, regional plans and district plans.

2. Emissions Reduction Plan to be Taken into Account in Policies and Plans

At the same time, a change was made in the rules for the making of RMA policy statements and plans, adding the Emissions Reduction Plan (made under the Climate Change Response Act 2002) to the instruments which the decision-maker "shall have regard to".[16] This is a positive direction, one which decision-makers must comply with. (In contrast, the above-noted removal of sections 70A and 104E merely gave them permission to consider climate change.) However, the direction to "have regard to" is not a strong one, not as strong as "shall give effect to." Further, the direction will take time to have an effect, because statements and plans can be in effect for years before they are revised or replaced, and the obligation to have regard to the ERP only applies at the point of making a new policy or plan or revising an existing one. More time (often two or three years) is needed to develop a policy or plan and take it through the statutory process.

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[12] The leading case was *West Coast ENT Inc v Buller Coal Ltd* [2013] NZSC 87.

[13] On this see Greg Severinsen, "Carbon Capture Considerations under the Resource Management Act: a Barrier to Carbon Capture and Storage Deployment in New Zealand?" (2014) 22 Waikato L Rev 117.

[14] Resource Management Amendment Act 2020, ss 19 and 35. These provisions came into force on 30 November 2022: s 2 Resource Management Amendment Act 2020, and Resource Management Amendment Act 2020 Commencement Order 2021) SL2021/433. For a Board of Inquiry or the Environment Court acting on the call-in of a project of national significance, for resource consents the same result was obtained from 2020, in relation to ss 149P(2) and 149U(2); see ss 52 and 55 of the 2020 Amendment Act. However the equivalent change was not made for the EEZ Act; see below.

[15] Also see s 3 as to effect including any positive or adverse effect, and s 171 as to designations.

[16] Resource Management Amendment Act 2020 ss 17, 18 and 21, amending ss 61(2), 66(2), and 74(2) in the principal Act. Generally see Blair Dickie and Alejandro Cifuentes, "Significance of 30 November 2022 for implementation of New Zealand's climate change response policy" (November 2022) Resource Management Journal 7. For clarity, it can be noted that these new obligations concern policy statements and plans, and not resource consent decision-making, except in the sense that the new obligations will shape the policies and plans that in turn shape resource consent decisions.

As for what in the Emissions Reduction Plan particular regard must be had to, one notes that the present ERP is silent on CCS, but it is clear about the reductions required, the switch to low-emissions fuels, the sector budgets, and the preparation of a Gas Transition Plan.[17] If the Plan were to identify the role of CCS in reducing emissions, then entities making policies and plans under the RMA would be obliged to have regard to that stipulation. It is recommended that the ERP provides for CCS. Local bodies and other entities are not specifically directed to have regard to the Gas Transition Plan, but it has significance in the statutory framework, as one of the actions called by the ERP; so it is also recommended that Gas Transition Plan also provides for CCS.

An ERP is made for each budget period, and completed and published at least twelve months before the commencement of the budget period.[18] The next budget period is from 2026 to 2030, so the next ERP must be completed by the end of 2024. The ERP calls for the Gas Transition Plan to be developed by the end of 2023.

The opportunity therefore exists first, to ensure that suitable provisions for CCS are incorporated in the ERP and the Gas Transition Plan, and secondly, to ensure that those provisions produce desirable changes to regional policy statements, regional plans, and district plans.

3. Climate Change Response Act section 5ZN

Another positive change in the signals that Parliament sends to decision-makers is section 5ZN of the Climate Change Response Act 2002, inserted in 2019. In full it provides:

> If they think fit, a person or body may, in exercising or performing a public function, power, or duty conferred on that person or body by or under law, take into account—
> (a) the 2050 target; or
> (b) an emissions budget; or
> (c) an emissions reduction plan.

This authorizes decision-makers under different Acts to take the target, budgets, and ERP into account when otherwise they might not have power to do so. It does not compel a decision-maker to take them into account, although circumstances may sometimes occur where a court might rule that there is no rational basis for not taking them into account, so that they would be close to mandatory. The section must be relevant in RMA decision making, accompanying the new RMA provisions noted above, and it is also possibly relevant to some decisions under the EEZ Act, discussed below. It explicitly extends the range of considerations to the 2050 target and the emissions budgets, even if they were not implicitly to be taken into account as part of the ERP. If CCS was included in the ERP, it could be directly taken into account in the making of RMA decisions.

Section 5ZN was given a confined reading in *Students for Climate Solutions Inc v Minister of Energy and Resources*[19] because the statutory framework of the Crown Minerals Act 1991 carefully stated the mandatory considerations to be taken into account in deciding on an application, and this section could not change them. While that may be the result in some statutory contexts, it will not apply to them all, and it does not mean that the section is

[17] Ministry for the Environment, *Emissions Reduction Plan* (2022) pp 200, 215, 216, and 222.

[18] Climate Change Response Act 2002 ss 5X, 5ZG and 5ZI.

[19] [2022] NZHC 2116.

ineffectual generally. More decisions on section 5ZN are likely to test its application in different contexts.

4. Positive consequences for CCS

The result of these change to the RMA (and, to a less certain degree, the enactment of s 5ZN of the CCRA) is that the positive effects of the activity of CCS on climate change can, and must, now be taken into account when decisions are made under the RMA. CCS can be put forward as having a positive effect on the environment, in relation to climate, so it should be easier for RMA decisions to be made in favour of CCS. Certainly it is a great improvement from the situation where the adverse effects of CCS, including the risks, had to be evaluated without being weighed against the positive effects. It is also valuable that the Emissions Reduction Plan must be taken into account in making RMA policies and plans. These are significant changes even though it remains to be seen what weight decision-makers put on them, and what conclusions they come to.

E. National Policy Statements and National Environmental Standards

The RMA provides for national direction in the form of National Policy Statements (NPS) and National Environmental Standards (NES) and it can usefully be applied to CCS.[20] This national direction addresses the decentralization that is a feature of the RMA and that gives primary decision-making power to regional councils and city and district councils. Both NPS and NES are initiated by the Minister for the Environment, and the Act lays down the options for the procedures to be followed (including notification and submissions) leading up to approval by the government. In deciding on how to proceed, the Minister may consider the advantages and disadvantages of preparing the proposed national direction quickly.[21]

An NPS states objectives and policies for a matter of national importance. The suitability of an NPS for CCS is evident in some of the items on the list of matters that the Minister may have regard to in determining whether it is desirable to prepare an NPS: the actual and potential effects of the use of natural resources, New Zealand's obligations in maintaining aspects of the global environment, and anything concerning the effects of the introduction of new technology that may affect the environment.[22] An NPS is binding on decision-makers making regional policy statements, regional plans, and district plans; their policies and plans must be made in accordance with it.[23] As for resource consents, the decision-maker must have regard to an NPS; it is a mandatory consideration.[24] A favourable NPS does not guarantee success, but it makes a consent a good deal more likely in the absence of significant countervailing factors. It also governs the policies and plans that in turn are significant in the consenting regime. An NPS can state firm policies that have the effect of what in ordinary speech would be called rules,[25] but it can provide for some flexibility in the application of the policies and the balancing of the different values involved.

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[20] See the 2013 Report pp 28 and 43; and in the RMA ss 43-55.

[21] RMA s 46A(4)(d).

[22] RMA s 45(2).

[23] RMA ss 61, 66(1), and 74(1).

[24] RMA s 104(1).

[25] *Environmental Defence Society v NZ King Salmon Co* [2014] NZSC 38 para 116.

Some of the NPSs that have been made to date cover specific sectors or activities, for example for electricity transmission, and for renewable electricity generation. Others are more system-wide in their character; for freshwater, highly productive land, and urban development. The NPS on Renewable Electricity Generation[26] as an example is short (8 pages long), and it identifies renewables as a matter of national significance, it states the objective of recognizing renewable generation and providing for it so that it increases to a level that meets government targets, and it states eight particular policies. One policy directs decision-makers under the Act to recognize and provide for the national significance of renewables and their benefits; others direct them to have regard to particular matters, such as the need to protect assets, the need to meet government targets, and the need to locate activities where the resource is available. Another requires regional policy statements and regional and district plans to include objectives, policies, and methods (including rules) to provide for the development of new renewable activities. Similar provisions could be made for CCS.

In contrast, an NES states specific rules, and in particular it can define an activity and state that it is a prohibited activity, a permitted activity that requires no resource consent, or an activity for which a resource consent is required. The NES prevails over rules in a regional plan or district plan, and it must be given effect by local authorities exercising their RMA powers. It has the status of regulations. It could state that CCS injection is a discretionary activity, and that conditions, secured by a bond, must be imposed to require monitoring, measurement and verification after closure.

An example of an NES presently in force is one that states that a cellphone tower is a permitted activity if its size and radiofrequency emissions stay below certain levels, and that rule applies in all parts of the country. Other NESs are in place for air quality, electricity transmission activities, freshwater, marine aquaculture, plantation forestry, sources of drinking water, and storing tyres.

NPS and NES can work together, the first to elaborate the general objectives and policy framework, and the second to lay down rules where specific standards are workable. A current example is a proposal to give national direction on the use of fossil fuels for industrial process heat.[27] The government has stated its policy for the sector, but at present the policies and rules of regional councils do not address the matter. A new NPS will set out objectives and specific policy intentions, and the accompanying NES will make rules, for example prohibiting GHG emissions from new coal-fired assets for low and medium temperature heat requirements, or requiring certain sites to have a GHG emissions plan. Similar steps could be taken for CCS.

An NPS for CCS would be valuable in changing the policy settings for RMA decision-making. It could state national objectives and policies that would be given effect by Boards of Inquiry, the Environment Court, regional councils, and district councils. While an NPS cannot amend the Act (nor can an NES) it can clarify how the general purpose and principles of the Act are to be applied to the process of evaluating the positive and negative effects of CCS activities. Whether an NES is required would probably become apparent in the course of policy development leading to an NPS; it is not self-evident that one will be necessary. An NES could stipulate that CCS injection is to be a discretionary activity, so that it cannot be

[26] Ministry for the Environment, "National Policy Statement for Renewable Electricity Generation 2011."

[27] Ministry for the Environment, "Phasing out Fossil Fuels in Process Heat: National Direction on Industrial Greenhouse Gas Emissions" (Consultation document 2022).

classified as non-complying or prohibited. (It is unrealistic to expect it to be classified as a permitted activity.) An NPS or NES could indicate or stipulate conditions that should be imposed if consent is granted for a CCS injection.

F. Proposals of National Significance: "Call-ins"

The conventional procedure for most RMA decisions is for the local authority (regional council, city council, or district council) to decide the matter, and for there to be an appeal heard by the Environment Court if one of the parties exercises its right to appeal. This can be unnecessarily time-consuming especially when it is obvious that one or another party will take the matter to the Environment Court, and beyond to the High Court, if it believes that an error of law has been made. It can also be cumbersome if local authorities have not agreed on a single hearing for a project. As a result the RMA provides for a "call in" or fast-track of a project of national significance,[28] which might be a plan change, an application for a resource consent, or a notice of requirement for a designation. The Minister for the Environment may call a project in, or the applicant may lodge its application with the Environmental Protection Authority to be considered for a fast-track procedure. The matters the Minister is to have regard to in deciding if it is of national significance to be put through such a procedure are spelled out and could well include a CCS project.[29] The Minister may decide whether to refer the matter to a Board of Inquiry or to the Environment Court; in either case the only appeal is to the High Court on point of law. It would not be possible for the Minister to make a general commitment in advance to call in any class of project.

Under these procedures, the matters that the Environment Court or Board of Inquiry must consider are in effect the same as for the relevant local authority, with the sole addition of having regard to the Minister's reasons for referring the matter to it and to any information that the Environmental Protection Authority supplies it.[30] Thus the "call in" produces procedural benefits but does not change the substantive factors that bear on the decision.

One of these call-in procedures could be suitable for a CCS project, especially one that goes beyond reinjection of CO_2 from gas processing.[31] It would ensure an integrated procedure, and provide some acceleration of the time frame. The call-in procedures are now often being used for large projects.

G. Adaptive Management under the RMA for Long-Term Projects

More than most projects that are consented under the RMA, CCS projects are likely to involve complexity and long-term operational and monitoring phases. Operating a CCS facility is expected to entail adjustment of injection in the light of information about subsurface conditions and as a response to unexpected events or conditions. A suitable legal framework has therefore often been thought to include special-purpose long-term permits and a regime of site plans that would allow for detailed regulatory oversight and adjustment of

[28] RMA Part 6AA, ss 140-149ZG. Also to note are: ss 87C-87I for streamlining and direct referral to the Environment Court; and the COVID-19 Recovery (Fast-track Consenting) Act 2020, but it expires on 8 July 2023.

[29] RMA s 142(3): for example New Zealand's international obligations to the global environment, and technology, processes or methods that are new to New Zealand.

[30] RMA ss 149P and 149U.

[31] 2013 Report, p 37.

operating conditions.[32] However, in this respect the RMA has a more short-term approach; a project is the subject of an application for consents, the application is considered and decided, and if approved the decision includes the consent conditions that control operation of the project. Like a court decision, the consent decision is intended to be final and provide clarity for the operator and others involved for the lifetime of the consent. There are provisions for the review of resource consents and the variation of consent conditions,[33] but the procedures are not flexible and in many cases will be substantially the same as required for the resource consent application itself.[34] The consent authority cannot postpone a part of its decision until a later date, so as to allow for operational fine-tuning of the project from time to time, and it cannot delegate its decision-making duties for that purpose either.[35]

However, even with these constraints, a certain amount of flexibility has been found under the RMA by using the concept of adaptive management. Adaptive management is a process of managing a project where which decisions can be adjusted as the outcomes of earlier management actions and other events become understood.[36] If those outcomes are carefully monitored, knowledge and information grows, and the operating parameters for the project can be adjusted, whether to increase environmental protection, or to dispense with precautions that turn out to be unnecessary. It is a process of iterative learning and adjustment over time in the face of uncertainties, so it is suitable for long-term projects. It is often implemented through environmental management plans (EMPs) that are described and required in the conditions attaching to a resource consent for the project.[37]

The courts have approved the use of adaptive management and EMPs, even though neither concept is referred to expressly in the RMA. The leading case, *Sustain Our Sounds Inc v New Zealand King Salmon Co,* held that adaptive management was lawful in the context of approval of a marine farm under the NZCPS.[38] There must be an adequate evidential foundation to have reasonable assurance that the adaptive management approach will achieve its goals of sufficiently reducing uncertainty and adequately managing any remaining risk. Relevant factors are: the extent of the environmental risk (including the gravity of the consequences if the risk is realized), the importance of the activity, the degree of uncertainty, and the extent to which an adaptive management approach will sufficiently diminish the risk and uncertainty. Other decisions have accepted its use in different circumstances. It is recognized as providing flexibility, such as through staged development, and is a manifestation of the precautionary principle, allowing risk to be managed as information uncertainty is reduced.[39] The courts have also accepted EMPs; when a resource consent is

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[32] 2013 Report, pp 109 and 137.

[33] RMA ss 127 and 128-133.

[34] Hilke Giles and Barry Barton, "Adaptive Management under the RMA: the Tension between Finality and Flexibility" (2020) 24 NZ J Environmental Law 1, p 27.

[35] Giles and Barton p 12. The RMA ss 34 and 34A does allow certain kinds of delegation but none that is relevant here.

[36] Giles and Barton p 3.

[37] Giles and Barton.

[38] [2014] NZSC 40, [2014] 1 NZLR 673, especially paras 125 and 129.

[39] Jennifer Caldwell and others, *Conditions of Consent* (paper presented in Resource Management Law Association Roadshow, July 2014); Derek Nolan, "The Coastal Environment" in Derek Nolan (ed) *Environmental and Resource Management Law in New Zealand* (5th ed, LexisNexis, 2015) at [5.65]; Giles and Barton; *Golden Bay Marine Farmers v Tasman District Council* EnvC Wellington W19/2003 (27 March 2003) at [405], affirmed on this point in *Minister of Conservation v Tasman District Council* HC Nelson CIV 2003-

issued for a project, it can include a condition that the consent holder produce an EMP and update it from time to time to address some aspect of the project's possible effects on the environment. The EMP can provide the consent authority with information about the way the consent holder intends to comply with the more specific controls or parameters laid down by the consent conditions; changes in the methods of compliance should be allowed under the EMP without having to apply for a variation of the conditions of consent.[40]

However, adaptive management and EMPs need caution, and they have limitations in the flexibility that they provide. An applicant for consents for a project cannot invoke adaptive management and EMPs as a substitute for providing the all the necessary information and detail about the project and its likely environmental effects; the consent authority must be able to assess the project properly, and cannot be asked to leave important questions until later.[41] The conditions under which a consent is granted must be specific, clear, and accurate, so that they are enforceable and reasonably certain.[42] The consent conditions must contain clear objectives that provide focus to EMP provisions, and clear performance criteria or environmental limits which operate as bottom lines that the EMPs must achieve.[43] The EMPs can state the methods through which the limits will be achieved, and they can embody a power of certification of results, but they cannot amount to an unlawful delegation of the consent authority's powers.

The way that adaptive management and EMPs would be employed for a CCS project under the RMA can be summarized as follows. The proponent applies for resource consents, providing enough detail to enable the consent authority to understand the project and its possible effects on the environment. It proposes an adaptive management approach, which it shows will sufficiently reduce uncertainty and manage any remaining risk adequately. The consent authority decides to issue the resource consent, stating environmental limits and requiring adaptive management and EMPs. The EMPs are prepared and revised by the operator or a technical advisory group in the light of monitoring information. However the operator must apply to the consent authority under section 127 of the Act to change consent conditions for any change in environmental limits or other substantial requirements. The procedure that is followed is much the same as that for obtaining a resource consent.

Adaptive management measures are something that decision-makers are required to have particular regard to under the NPS for Renewable Electricity Generation.[44] The same kind of encouragement could be included in an NPS for CCS.

Overall, it is evident that adaptive management provides some flexibility in the regulatory framework for a long-term project like a CCS project, but it is only a limited improvement; it is not a cure-all. The RMA framework can probably be made to work for CCS but it is far from ideal, either for the injection period or post-injection. The consequences could be

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485-1072 (9 December 2003), Young J; *Crest Energy Kaipara Ltd v Northland Regional Council* [2011] NZEnvC 26.

[40] *Wood v West Coast Regional Council* [2000] NZRMA 193 (NZPT) at 6 and 7.

[41] *Crest Energy v Northland Regional Council* EnvC Auckland A132/09 (22 December 2009) at [229].

[42] *Ferguson v Far North District Council* [1998] NZRMA 238 at 244; *Pioneer Developments v Waitemata City Council*, SC Auckland M 627/78 (16 February 1979).

[43] Environmental Protection Authority, Board of Inquiry, *Final Report and Decision of the Board of Inquiry into the Transmission Gully Proposal* (June 2012) at [190].

[44] National Policy Statement for Renewable Electricity Generation 2011, Policy C1, p 6.

inadequate protection of the environment; or they could be conditions that are unnecessarily protective and can only be adjusted by going through the section 127 procedure. Adaptive management under the present settings is unlikely to be a satisfactory policy option.

H. The Post-Injection Period

International models for CCS regulation have put considerable emphasis on the regime for the closure period, once the injection period comes to an end, and the post-closure period, which in some systems may commence later once it is clear that fluids in storage are acting as expected.[45] Here, these two periods will be considered together, as the post-injection period.

The initial activity post-injection is the plugging and abandonment of wells and decommissioning of the project facilities. What then becomes important is monitoring, measurement and verification (MMV) in order to confirm that the CO_2 is securely sequestered, and that fluids in subsurface structures are behaving as predicted. If there are failures in the sequestration, it may be possible to rectify them, especially where they are the result of the imperfect plugging and abandonment of a well.

If a comprehensive CCS Act were enacted, its core would be a permit system that would include a site closure permit to manage this period, and there would also be site closure plans to furnish the detailed regulation.[46] Without such legislation, then the alternatives need to be considered. It seems essential that some form of regulatory control is in place for this period, because that is when operations to ensure the integrity of the storage are finalized, and when the stability and completeness of the storage are thoroughly tested. It could take some years before MMV activities provide enough information for the operator and the regulator to provide full assurance that the sequestration is secure.

The legal issue that arises is how to provide dependable authority for this regulation without a customized CCS Act. There seem to be two aspects to it, greenhouse gas (GHG) accounting, and environmental management. The first is examined in a later section of this report, where it is concluded that the Climate Change Response Act 2002 provides clear powers to manage GHG accounting and the NZETS liability for any escape of CO_2 from sequestration.

As for the second aspect, environmental management under the RMA, the complication is that although a discharge permit is required for injection, one is probably not required for the post-injection phase, when the CO_2 has been discharged into the environment and is in geological sequestration.[47] Once the operator has stopped injecting CO_2, it can no longer be compelled to hold a discharge permit.[48] The solution that the Act provides at present is for a permit to be issued subject to a condition requiring a bond to be given for the performance of the other conditions of the consent, under sections 108 and 108A. The bond may continue after the expiry of the consent to secure ongoing performance of conditions relating to long-term effects and effects that do not become apparent until after the expiry of the consent, including remedial, restoration and maintenance work, and the monitoring of long-term effects. The

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[45] International Energy Agency, *Legal and Regulatory Frameworks for CCUS* (2022).

[46] 2013 Report Chapters 5 and 6.

[47] The point is noted by Greg Severinsen, "Constructing a Legal Framework for Carbon Capture and Storage in New Zealand: Approaches to Legislative Design" (2014) 63 Energy Procedia 6629 at 6640.

[48] As noted above, it is assumed for present purposes that the "storage" dimension of CCS, after injection, does not require a resource consent of any kind.

condition can say that the liability of the consent holder is not limited to the amount of the bond. Where the consent holder fails to carry out the work in respect of which the bond is given, the consent authority may enter and complete the work itself and recover the cost from the consent holder.[49]

Section 108A therefore provides a legal basis for the consent authority to regulate the project during the closure period even if there is no discharge permit in place, and to do so for a long-term period. It can particularly address the long-term effects of a project, monitoring, and rectification. The injection permit conditions could be carefully designed to provide a reasonably flexible regulatory regime for the closure period, employing adaptive management principles, backed up by the bond obligation and the possibility that the consent authority could intervene and carry out works itself. The principles or detail of the regime could be laid out in an NPS-CCS and NES-CCS. However reliance on section 108A bonds is likely also to have shortcomings. One may be the cost and inflexibility of bonds, compared to other means of financial assurance.[50] A second possibility is that regulation under the bonding regime may not be as effective as regulation under a resource consent that is still in force; for example the monitoring and enforcement options of the regulator may not be as effective, or as flexible.

A different possibility for regulation in the post-injection period is to regulate CCS as a use of land and require a resource consent to be obtained for it; a land use consent lasts indefinitely, so the conditions imposed last indefinitely as well. However this may stretch the RMA scheme too far to be acceptable, and is not recommended.[51]

Although consent conditions and bonding, under sections 108 and 108A of the RMA, provide a possible method of regulating CCS in the post-injection period, they may have shortcomings that reduce their efficiency and efficacy. The reform alternative is to insert a power in section 360 to make regulations, notwithstanding other provisions of the RMA, for the post-injection period, for example in authorizing a resource consent to be issued for longer than 35 years, for it to be compulsory for the company to hold it even after injection has ended, and for the company to have a range of financial assurance options available to it. It is recommended that this alternative be explored.

I. Policy Settings under the RMA

The RMA identifies particular policy instruments that are relevant and that (as the next section describes) must be taken into account by decision-makers dealing with resource consents and other matters. We have noted above the importance of the changes in the 2020 Resource Management Amendment Act 2020 and the Climate Change Response Act s 5ZN:

- Emissions Reduction Plan: in making RMA policy statements and plans, the decision-maker shall have regard to the ERP
- Emissions Reduction Plan, 2050 target, emissions budget: all RMA decision-makers may take them into account.

[49] RMA s 109(4) and (5).

[50] The new petroleum infrastructure decommissioning requirements in the Crown Minerals Act show how more flexible provisions can be made for financial assurance, and so does the NBEA Bill.

[51] Ordinarily land use consents are granted by territorial authorities, such as city and district councils, but they can be required by regional councils under regional plans where they concern regional functions such as water quality: section 30(1)(c).

The policy context for statutory RMA decisions can therefore be described as slightly inclined towards CCS, with a potential to be developed further.

However, there is no National Policy Statement on CCS in place, and there is probably very little if anything on the subject in regional policy statements, regional plans, and district plans. From time to time the opportunity arises to advocate for CCS to be addressed in these instruments, at the national level, in regional councils and in district councils, and it is recommended that these opportunities be taken. For example changes could be made to the Taranaki Regional Fresh Water Plan or the proposed successor document. The result would be significant change in the policy settings without requiring an amendment of a statute or regulations. Even if and when the RMA is replaced by the NBEA or similar legislation, these instruments are likely to have continuing application for some time into the future. On the whole, CCS projects will be easier to manage through the RMA permitting process if there is some express policy affirmation of their benefits and guidance about how those benefits are to be understood in relation to any possible adverse effects.

J. Matters Relevant to Deciding a CCS Resource Consent Application

The criteria that would be used to judge a CCS application under the RMA can be identified in general terms. In practice, for a particular project a much more detailed analysis would be carried out in light of the characteristics of the proposed project, identifying and evaluating the relevant matters to be taken into account, including engineering and subsurface operations. This process allows the applicant to decide what expert evidence it needs to assemble and how to present its case to a local authority, commissioners, or the Environment Court. There is a large body of case law from the Environment Court and other courts that illuminates the matters to be taken into account.

The central element of a CCS project in RMA terms is the reinjection, which requires a permit to discharge a contaminant to land, but a number of other ancillary consents and permits will inevitable be required as well. In addition, as discussed below under the heading of Property Rights, it is likely that a CCS application onshore will be facilitated by obtaining status as a requiring authority and seeking a designation under the RMA.

Section 104(1) of the RMA is the main control over matters to be taken into account in deciding on an application for a resource consent.

> (1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2 and section 77M, have regard to–
> (a) any actual and potential effects on the environment of allowing the activity; and
> (ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and
> (b) any relevant provisions of—
> (i) a national environmental standard:
> (ii) other regulations:
> (iii) a national policy statement:
> (iv) a New Zealand coastal policy statement:
> (v) a regional policy statement or proposed regional policy statement:

(vi) a plan or proposed plan; and

(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

Thus there are three main classes of matter that are relevant: effects on the environment, policies and plans, and other matters, all to be considered under the purpose and principles of the RMA in Part 2.

Effects on the environment include positive effects as well as negative ones, and as discussed above that can now include the positive effects of a CCS project on the atmosphere. The negative effects, including cumulative effects and effects that only have a low probability of occurring, would have to be analyzed clearly enough to satisfy decision-makers that they can make a well-informed decision on them. It would be important to address toxicity, seismicity, and effects on potable groundwater.[52] A principled analysis of effects may demonstrate that the adverse effects are local and of low or extremely low probability, but that the positive effects are substantial, at the global level.[53] It could emphasize that CCS is a mitigation of adverse effects; it has the effect of removing CO_2 as a contaminant from the atmospheric environment and disposing of it in the subterranean environment from which it came and in which it has no adverse environmental effect.

Policies and plans, as listed in clause (1)(b), have also been discussed above; on the whole the policy climate produced by these documents is slightly inclined towards CCS. A particular project would require analysis of the relevant regional council and district council documents. While CCS is probably not treated specifically in any of them, that is not uncommon with unusual proposals or specialized technology.

Any other matters, under clause (1)(c), is an open category but one that allows climate change and GHG emissions reduction to be taken into account. In particular it ties in with the Climate Change Response Act s 5ZN, discussed above, so that emissions targets, budgets and plans are legitimate matters to bring into account. It also allows the New Zealand Emissions Trading Scheme to be taken into account, so that the RMA decision-maker does not need to feel responsible for measurement, monitoring and verification, or for the possibility that there are escapes from disposal that reduce the effectiveness of the CCS as a removal activity; all those matters are addressed under the CCRA.

The overall purpose of the RMA in section 5 governs the consideration of all these matters: to promote the sustainable management of natural and physical resources.[54] The definition of sustainable management in section 5(2) gives ample opportunity to devise a case to justify CCS:

(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables

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[52] Experience with the reinjection of geothermal fluid may be a useful comparison, as an activity which would show substantial positive effects on the environment (maintaining pressure and temperature in a geothermal system) to be evaluated in relation to any negative effects.

[53] Reference may usefully be had to Greg Severinsen "Applying Principles of Environmental Law to Novel Technologies: The Case of Carbon Capture and Storage" (2017) NZ Law Rev 635, arguing that CCS is not storage but disposal (a removal); that it is inherently precautionary and sustainable; that it is not an adverse effect on the environment; and that the distribution of goods and bads dictates that the law place substantial weight on the beneficial global, atmospheric and future effects of CCS.

[54] However it does not allow an override of the clear provisions of the New Zealand Coastal Policy Statement or other policy statements: *Environmental Defence Society v NZ King Salmon Co*, [2014] NZSC 38 (see below).

> people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—
> (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
> (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
> (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

It seems very arguable that CCS is consistent with the sustainable management of natural and physical resources.

Principles. Section 6 directs RMA decision-makers to recognize and provide for a number of specific matters, and is mainly protective in its nature, but there is nothing in the list that seems at all adverse to consenting a CCS project. Section 7 directs decision-makers to have particular regard to a different set of matters, but again there does not appear to be anything in the list that would be adverse to CCS. There is reference to the efficiency of the end use of energy, the effects of climate change, and the benefits to be derived from the use and development of renewable energy, but all of those appear to be tangential to CCS.[55] More useful is "the maintenance and enhancement of the quality of the environment". Finally, section 9 requires decision-makers to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi). There is no obvious reason why that obligation should be adverse to CCS projects.

Discharges and coastal permits for discharges. Section 105 additionally requires the decision-maker to have regard to: the nature of the discharge and the sensitivity of the receiving environment to adverse effects; the applicant's reasons for the proposed choice; and any possible alternative methods of discharge, including discharge into any other receiving environment. These matters do not seem to present difficulties for CCS, especially in respect of the receiving environment. Section 107 directs that consent not be given if the contaminant, after reasonable mixing, would produce conspicuous oil or grease films, change in colour or visual clarity, and the like. It was considered above as probably not being relevant to injection of CO_2 into deep saline aquifers or other subsurface formations.

K. Natural and Built Environment Bill

A law reform process to replace the RMA has been under way for some time, and has resulted in the introduction in Parliament of the Natural and Built Environment Bill (the "NBEA") and Spatial Planning Bill.[56] While a review of these Bills is not in the scope of this report, three points can be made.

- First, the NBEA proposes that its central "system outcomes" will require provision for the reduction of greenhouse gases and their removal from the atmosphere; that certainly points towards CCS.

[55] "[T]he effects of climate change" in s 7(i) has generally been understood to direct attention to adaptation to climate change. The direction in s 7(j) to have particular regard to the benefits to be had from the use and development of renewable energy expresses a preference but does not militate against CCS.

[56] The Bills were introduced on 15 November 2022. The main law reform analysis was *New Directions for Resource Management in New Zealand* (A Randerson, chairperson), July 2020. That report recommended that the new Acts require both mitigation and adaptation to be pursued under them, require national direction, and be better aligned with the Climate Change Response Act 2002.

- Secondly, the expectation of the new legislation should not deter efforts that are put into changing policy settings, for example in promoting an NPS-CCS or provisions in a regional policy statement; those instruments are likely to be grandparented for some time even when the new legislation comes into force.
- Thirdly, the passage of the new legislation through Parliament presents significant opportunities to ensure that CCS can be managed suitably, and at a minimum to ensure that no new obstacles are put in its way unintentionally; and it is recommended that the progress of the bills is monitored for that purpose.

L. Conclusions on the RMA

It is therefore possible to conclude that a CCS project has a reasonable prospect of being properly assessed and (if in order) consented under the RMA. The RMA provides a workable regulatory framework for CCS, if not an ideal one; where it is less suitable is in providing interactive regulation and adjustment of operating conditions for a long-term project, and in providing for the post-injection period. The Act does provide mechanisms that can be harnessed to manage both of these aspects, and they may prove to be adequate if not perfect. The RMA also provides the means for addressing or even fully resolving the property rights issues raised by subsurface activity, and the related possibility of property-related litigation, both of which are dealt with below. The actual viability of RMA regulation for CCS will become apparent when companies begin to apply for approval for particular projects. An applicant company can submit proposals for conditions for example to deal with the post-injection period, and the consent authority can decide whether they are adequate or whether more is required. Once the decision is made on the conditions, the company can evaluate whether to go ahead with the project on those terms.

As will be explained below, these conclusions apply to the coastal marine area only in general terms; the only CCS injection that appears to be possible is by way of reinjection in an oil and gas operation.

Law and Policy Changes

Some of the most effective reform options are to change policy settings to address CCS more explicitly. The main recommendation is to promote a national policy statement on carbon capture and storage, to recognize it as a matter of national importance, and to state objectives and policies for it, such as recognizing its desirability to meet emissions reduction targets. It would direct decision-makers to have regard to adaptive management options. There is precedent as noted above for NPS on subjects like renewable energy. A national environmental standard may be desirable to accompany the NPS. At the regional level, but just as likely to be productive, are changes to RMA regional policy statements, regional plans, and district plans, to recognize the role that CCS can play in reducing GHG emission reductions. Other recommendations target specific issues such as the long-term post-injection period, and (discussed below) the coastal marine area.

Hypothetically one can imagine amendments that go further, for example to take CCS out of the RMA altogether, but many interests put much store in the comprehensiveness of the RMA, making few exceptions to its general effect.[57] These possibilities are not pursued here.

At the present, any proposal to amend the RMA will be overshadowed by the new legislation that is in Parliament, and some reluctance can be expected to greet proposals for RMA amendments in the meantime unless they address an urgent problem. Effort will be better directed at ensuring that the new legislation, the NBEA and the SPA, offer a regulatory framework that can be employed effectively for CCS projects.

III. CCS at Sea

A. Introduction: London Dumping Protocol

Two zones and two scenarios. The most foreseeable prospects for CCS at sea are for the use of existing offshore petroleum installations for CCS purposes, and that is the main case considered in this section. It does so in relation to two zones, the coastal marine area, out to the twelve-mile limit, and the exclusive economic zone (EEZ) that lies beyond it. New Zealand has offshore petroleum installations in both zones, but different law applies to each of them. For each zone, this report concentrates on the two scenarios described earlier:[58]

- The "reinjection" scenario: the use of an offshore petroleum installation for CCS for CO_2 removed from the natural gas extracted and processed on the installation, ie offshore processing of gas followed by reinjection of the separated CO_2 into geological formations in or below the seabed.
- The "third-party CO_2" scenario: the use of an offshore petroleum installation for CCS for CO_2 transported by pipeline from onshore or elsewhere to the installation for injection.[59]

Even only in its application to these two scenarios, the legislation is complex and some detail is required to understand its implications. In some of the following sections of this report, it is possible to come to definite conclusions about the status of CCS, but in others there is a good deal of uncertainty. At the end of this section on CCS at sea, the results are gathered together, for both zones and both scenarios. Recommendations are made, primarily to clarify the law and bring it up to date.

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[57] For example a new power could be added to s 360 to make regulations for CCS that would prevail over other provisions of the Act; or s 360(1)(h) could be used to prescribe an exemption for CCS from s 15, an action that has been taken only twice, for spraying to control an insect incursion, and for poisons to control pest fish and animals.

[58] In contrast, the main focus of the 2013 Report was projects wholly or mainly concerned with CCS, and it evaluated the difficulties facing such projects under the RMA and the EEZ Act. Chapter 2 examined problems applying the existing legislation, and Chapter 9 reviewed the EEZ issues in more detail. At that time maritime legislation was being substantially reorganized, but the amendment legislation is now in force, although in some cases not in terms of the draft legislation that was considered in the 2013 Report.

[59] This scenario includes CO_2 from any source other than the extracted natural gas, so would include CO_2 from another oil and gas field, and direct air capture on the installation, even though DACCS on an oil and gas platform is an unlikely development.

London Dumping Protocol. Marine pollution law is influenced by international law and the London Dumping Protocol in particular. Some of the provisions in the RMA and EEZ Act and the regulations under them were put there to give effect to New Zealand's obligations under the Protocol. They also reflect the terminology of "dumping" which is deliberate disposal, and "discharge" which may or may not be deliberate.

In the early stages of the examination of laws for CCS it was realized that the very protective nature of the London Dumping Protocol would prohibit the geological sequestration of CO_2 offshore.[60] Negotiations proceeded rapidly and Annex 1 of the Protocol was amended in 2006 to add, as a substance that can be dumped,

> CO_2 streams from CO_2 capture processes for sequestration

subject to the restrictions that:

> Carbon dioxide streams may only be considered for dumping, if:
>
> 1 disposal is into a sub-seabed geological formation;
> 2 they consist overwhelmingly of carbon dioxide. They may contain incidental associated substances derived from the source material and the capture and sequestration processes used; and
> 3 no wastes or other matter are added for the purpose of disposing of those wastes or other matter.

The Protocol's Scientific Group produced two sets of detailed guidelines on geological storage of CO_2 in the marine environment. Many countries have given effect to the 2006 amendment of the Protocol in their national legislation.[61] As will be seen below the anomalous lack of such legislation in New Zealand presents some difficulties for CCS offshore.

B. The Coastal Marine Area and the RMA

1. The coastal marine area

This section concerns CCS operations in the coastal marine area, as that term is used in the Resource Management Act 1991, and which is much the same as the territorial sea, extending from the high-water mark out to the twelve nautical mile limit (22.224 km). It is subject to the RMA, and the regional councils exercise environmental management powers over it. There are a number of provisions in the RMA and regulations under it specially for the coastal marine area. The main ones that are relevant here are:

- Section 2, defining discharge and dumping;
- Section 15, the general restriction on the discharge of a contaminant, and the default provision if the more specific provisions of ss 15A and 15B do not apply;
- Section 15A, on the dumping of waste from a ship or offshore petroleum installation;
- Section 15B, on discharges that of a harmful substance or contaminant from a ship or offshore petroleum installation; and
- The Resource Management (Marine Pollution) Regulations 1998.

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[60] Tim Dixon, Sean T McCoy and Ian Havercroft, "Legal and Regulatory Developments on CCS" (2015) 40 Intnl J Greenhouse Gas Control 431.

[61] Ian Havercroft and Christopher Consoli, "Developments and opportunities: a review of national responses to CCS under the London Protocol" (Global CCS Institute, perspective paper, May 2022). The main issue in the international discussions on marine CCS is now cross-border transport of CO_2, but that is not a concern for New Zealand. On the Protocol generally, see the 2013 Report p 186.

2. Reinjection in the coastal marine area

The first scenario is reinjection of CO_2 removed during the processing on the offshore platform of natural gas produced from wells connected to the platform. Two possibilities exist under the RMA, that it is dumping or a discharge.

Dumping. The first possibility is that the reinjection is regulated under section 15A as the dumping of waste or other matter from an offshore installation. "Dumping" and "waste or other matter" are defined in section 2 of the RMA.[62] The basic meaning of dumping is the deliberate disposal of waste or other matter. This is broad enough to include CCS unless some exception applies. (The main exception to the definition is considered below.) If we assume that CCS is included and is dumping, the next step is to turn to the Regulations.

Regulation 4 of the Resource Management (Marine Pollution) Regulations 1998 deals with dumping. Regulation 4(1) declares that the dumping of waste or other matter from an offshore installation in the coastal marine area is deemed to be a prohibited activity, unless an exception applies. (This reflects the "white list" structure of the London Dumping Protocol, prohibiting all dumping unless it is of a substance identified on an exhaustive list.[63]) The consequence is that a resource consent cannot be obtained to authorize the activity. Neither a regional council, a panel on a call-in, the EPA, nor the Minister may grant the consent; the only way to remove the prohibition is to change the Regulations.

Dumping but not prohibited. However regulations 4(2) and 4(3) provide exceptions to this prohibition of dumping.[64] The regulation 4(2) exception identifies seven forms of waste the dumping of which can be allowed as a discretionary activity: dredge material, sewage sludge, etc. The list does not include CO_2; the most plausible item on the list to include it is "inert, inorganic geological material" but it seems only faintly possible that CO_2 can be so described. Regulation 4(2) therefore appears to provide no exception to the prohibition.

Regulation 4(3) says that the clause (and therefore the prohibition) does not apply to "the dumping or storage of waste or other matter arising directly from, or related to, the exploration, exploitation, and associated offshore processing of, seabed mineral resources". It seems likely that this covers reinjection from the offshore processing of natural gas.

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[62] The definition of dumping in RMA s 2 in full is:

> **dumping** means,—
> (a) in relation to waste or other matter, its deliberate disposal; and
> (b) in relation to a ship, an aircraft, or an offshore installation, its deliberate disposal or abandonment;—
> but does not include the disposal of waste or other matter incidental to, or derived from, the normal operations of a ship, aircraft, or offshore installation, if those operations are prescribed as the normal operations of a ship, aircraft, or offshore installation, or if the purpose of those operations does not include the disposal, or the treatment or transportation for disposal, of that waste or other matter; and **to dump** and **dumped** have corresponding meanings …

Waste or other matter is defined very broadly in s 2: "materials and substances of any kind, form, or description".

[63] See Greg Severinsen, "The Environmental Regulation of Marine Carbon Capture and Storage in New Zealand: Principles, Barriers and Gaps" unpublished PhD thesis, Victoria University of Wellington, 2017) p 116.

[64] The making of regulations having this effect is authorized by RMA s 360(ha). The content of the regulations is deemed to be included in regional coastal plans.

The one difficulty is the meaning of "seabed mineral resources" which may only mean resources on or near the seabed, not deep below it. The term is not defined in the Act or Regulations and its meaning is uncertain. The Act defines "coastal marine area" to mean the foreshore, seabed, and coastal water, and the air space above the water; the draftsperson did not see the necessity of adding reference to the subsurface below the seabed, suggesting that seabed includes the subsurface. Further, section 12 restricts any disturbance of "the foreshore or seabed (including by excavating, drilling, or tunnelling)" suggesting that the seabed is more than a mere plane. On the other hand, section 12 also refers to depositing or disturbing "in, on, or under any foreshore or seabed" could be put forward to the contrary.[65] The London Protocol and associated documents often refer to the seabed and sub-seabed resources,[66] and so do other international instruments, and their intention will be relevant to an interpretation point like this. One reliable source reports that it is generally accepted that in this context seabed mineral resource activity includes oil and gas exploration and exploitation activities.[67] As a matter of general principle, it can be said that it is unlikely that the maker of the Regulations would have left the boundary between "seabed" and "sub-seabed" resources undetermined and would have failed to provide for sub-seabed resources. References to "in and under" the seabed or to the seabed and the sub-seabed could be seen to be an abundance of caution in drafting rather than an attempt to delineate two different zones.[68] Overall, there is a good but not conclusive case that natural gas is intended to be included in "seabed mineral resources"; if so, the exception in regulation 4(3) applies, and CCS by reinjection is dumping, and it is not prohibited. If that argument is not successful, CCS by reinjection is prohibited.

If CCS by reinjection is dumping but not prohibited, then under section 15A a resource consent must be obtained.[69] Special provisions in section 138A apply, implementing international convention obligations; the consent authority (usually the regional council) must have regard to the nature of the discharge, the sensitivity of the receiving environment, possible alternative methods of disposal, and conditions to require the use of the best practicable option to prevent or minimize adverse effects.[70] These requirements are unlikely to be onerous additions to the usual RMA requirements.

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[65] The usage of terms by responsible agencies may give an indication of the meaning of a regulation but not a strong one. One can point to the Ministry for the Environment, *Managing our Oceans: a Discussion Document on the Regulations Proposed under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act* (2012) p 6, but the separate treatment of oil and gas and seabed mineral resources is only oblique; and it would only be relevant to the EEZ Regulations (discussed below), not the interpretation here of regulations under the RMA.

[66] Dixon McCoy and Havercroft (2015) do not investigate the matter but show that there is often reference to the seabed and the subsoil thereof, or to sub-seabed geological structures.

[67] Global Carbon Capture and Storage Institute / Bech-Bruun, *EOR / CCS 360-Degree Legal Review* (2012) p 30.

[68] Analogous is the rule that a conveyance of "land" includes everything above and below it without having to say so expressly: N Campbell et al, *Principles of Land Law in New Zealand*, 3d ed (LexisNexis NZ, 2020) vol 1 p 108.

[69] The consent is a coastal permit: s 87. Neither s 12 nor 15 applies to it: ss 12(6), 15(3).

[70] See Severinsen (2017) p 135.

Exception to the definition of dumping. The foregoing discussion deals with the possibility that CCS reinjection in the coastal marine area is dumping. What must be considered now is that such CCS is not dumping at all. There are two exceptions to the definition of dumping.[71] The main one may extend to reinjection; it is the disposal of waste or other matter incidental to, or derived from, the normal operations of an offshore installation, if the purpose of those operations does not include the disposal, or the treatment or transportation for disposal, of that waste or other matter.

Determining whether CCS is included in this exception is not straightforward. The elements that seem clear are that:

- CO_2 can be included in the term waste or other matter;
- disposal is something different from normal operations; and
- the purpose of the normal operations must not include disposal off the installation.

What seems unclear is:

- whether natural gas processing of any kind is a normal operation on an installation;
- whether normal operations are those of the particular installation, or those of offshore installations generally, in New Zealand, or around the world (they are not all the same);
- whether normal operations are to be determined in relation to the historical record or in relation to an emerging low-carbon world;
- how the purpose of operations is to be understood in relation to normality;
- whether the purpose is simply to produce oil and gas, or whether it includes some degree of processing, including for decarbonization purposes;
- whether being incidental to or derived from implies that it must be intrinsic and generally present, or only occasional.

Even with these uncertainties, it is possible to identify an arguable case that reinjection is included in this exception. It is arguable that: the "normal operations" of an offshore installation, generally, are oil and gas extraction, and so is the treatment of natural gas to separate the CO_2; the "purpose" of those operations is to extract oil and gas; the "disposal" of CO_2 is distinct from those operations and not included in the purpose, that is, the installation was not built and is not operated primarily for disposal purposes; and the CO_2 is waste incidental to or derived from the normal operations. This argument is strengthened by noting that the purpose of an "offshore installation" in the definition of the term includes exploitation and associated processing of oil and gas.[72] The argument can be further buttressed by noting that the Regulations prescribing certain operations as normal operations are generic in character and do not refer to any specific ship or installation. If this argument is successful, the consequence would be that CCS by reinjection is not dumping within the meaning of the RMA, section 15A does not apply (nor does regulation 4), and it is discharge, considered next. If the argument is not successful, the CCS would be dumping and the analysis above would apply, showing that it may be prohibited or it may be discretionary.

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[71] The other exception is for certain operations are prescribed as the normal operations of an offshore installation by the Resource Management (Marine Pollution) Regulations 1998 reg 15 Schedule 4, but they do not include CCS or anything comparable to it.

[72] The RMA s 2 incorporates by reference the definition in the Maritime Transport Act 1994 s 222(1):

> *offshore installation* or *installation* includes any artificial structure (including a floating structure other than a ship) used or intended to be used in or on, or anchored or attached to, the seabed for the purpose of the exploration for, or the exploitation or associated processing of, any mineral; but does not include a pipeline …

Mineral is as defined in the Crown Minerals Act 1991 and includes oil and gas.

Discharge. If CCS by reinjection is not dumping under section 15A, it is likely to be a discharge of a contaminant, from an offshore installation, into land, that requires a resource consent (a coastal permit) under section 15B(1) of the RMA. (The relationship between the two sections is unclear.[73]) "Contaminant" is defined broadly in the Act and has been held to include carbon dioxide.[74] Regional coastal plans, made by regional councils and approved by the Minister of Conservation, can provide for the making of decisions on these coastal permits, classifying activities and stating relevant policies. Although regional coastal plans have not been examined for this report, it is assumed that most of them require a coastal permit to be obtained for any significant discharge even if they do not mention CCS by name. If the reinjection is a discharge then the general decision-making procedures and criteria of the RMA apply.

Several other possibilities under section 15B can be ruled out for the sake of clarity. Regional coastal plans are unlikely to make CCS a permitted or controlled activity; but such plans are unlikely to leave such a discharge like CCS unregulated so as to allow s 15B(1)(b) to come into play; CCS is not a discharge into air, or of water into water under s 15B(1)(c) or (2). Regulations do not prescribe CO_2 as a harmful substance, and do not override subsections (1) or (2).[75]

Consequences of the distinction between dumping and discharge. Whether CCS is classified as dumping or discharge is significant but not critical in relation to reinjection in the coastal marine area. (Both are very different from the prohibited activity status.) Both require a coastal permit from the regional council; both are governed by the RMA's general scheme; the NZCPS is relevant to both. In the case of dumping there is an overlay of considerations derived from international conventions, but they do not make a great alteration to the regulatory regime.

Recommendations for reform are included at the end of this section on CCS at sea.

3. Third-party CO_2 in the coastal marine area

The second scenario is third-party CO_2, that is, CO_2 other than what is separated from natural gas on the platform. The issues are the same as those raised above in relation to reinjection, so that discussion can be referred to in addressing the different fact situation more briefly.

It seems reasonably clear that CCS for this CO_2 is, under the RMA, "dumping" as the deliberate disposal of waste or other matter, and that it does not fall into either of the provisos in the definition, discussed above. Section 15A therefore applies in that it is dumping from an offshore installation which requires a resource consent. However reg 4(1) of the Resource

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[73] If the reinjection is a discharge under s 15B then s 15 does not apply: s 15(3): but the Act does not spell out the relationship between ss 15A and 15B. Section 15A(3) addresses s 15B only as to harmful substances. It seems unlikely that the two sections were intended to provide alternatives for an applicant for a coastal permit; the Act may be interpreted to imply that the special dumping provisions must prevail if they apply, and otherwise the general rules for discharges apply. On these problems generally see Severinsen (2017) p 127.

[74] *Genesis Power Ltd v Greenpeace NZ Inc* [2008] 1 NZLR 803 (CA) para 15.

[75] Resource Management (Marine Pollution) Regs 1998 reg 3 defines harmful substances. Section 15B(4) of the Act provides for regulations or rules (ie rules in a regional plan) to override what is allowed under subs (1) and (2).

Management (Marine Pollution) Regulations 1998 applies, declaring that the dumping of waste or other matter is a prohibited activity, unless reg 4(2) or 4(3) applies.

The exceptions in regs 4(2) and 4(3) do not appear to apply. Following the discussion above ("Dumping but not prohibited") the list of types of waste in reg 4(2) that can be allowed does not include CO_2. Regulation 4(3) does not apply because the waste does not arise directly from, or related to the exploitation and associated offshore processing of seabed mineral resources.[76] The injection of third-party CO_2 must therefore be a prohibited activity,[77] for which no resource consent can be obtained. Neither a regional council, a panel on a call-in, the EPA, nor the Minister may grant the consent; the only way to remove the prohibition is to change the Regulations.

4. Policy Settings for Coastal Marine Area

The New Zealand Coastal Policy Statement 2010 is the primary policy instrument under the RMA for the coastal marine area, including it as part of the coastal environment. It states objectives that are protective in their character, to safeguard the integrity of the coastal environment and sustain its ecosystems, and to preserve its natural character. On the more developmental side, it states that it is an objective to enable people and communities to provide for their wellbeing through use and development of the coastal environment. (Other objectives call for the principles of the Treaty of Waitangi to be taken into account, and for the recognition of New Zealand's international obligations.) It proceeds to state specific policies through which these objectives are to be pursued, and again some of them are protection-oriented, such as Policy 13 which directs decision makers to preserve the natural character of the coastal environment and protect it from inappropriate development, and Policy 3 which directs them to adopt a precautionary approach towards proposed activities the effects of which on the coastal environment are uncertain, unknown, or little understood, but potentially adverse. On the development-oriented side, Policy 6 directs them to recognize the provision of infrastructure and the extraction of minerals as important to wellbeing, and to recognize that some activities have a functional need to be located in the coastal marine area.

The leading case on the NZCPS is *Environmental Defence Society v NZ King Salmon Co*,[78] where the Supreme Court ensured its primacy and protected its clear directions from being watered down by an approach that would make an overall broad judgment including the NZCPS as only one of a variety of matters to be put in the balance. The Court made a detailed examination of the NZCPS's objectives and policies, noting that some were aimed at protection while others were aimed at managing development. For some isues, and some places, protection was given priority.

> [152] The NZCPS is an instrument at the top of the hierarchy. It contains objectives and policies that, while necessarily generally worded, are intended to give substance to the principles in pt 2 in relation to the coastal environment. Those objectives and policies reflect considered choices that have been made on a variety of topics. As their wording indicates, particular policies leave those who must give effect to them greater or lesser flexibility or scope for choice. Given that environmental protection is an element of the concept of sustainable management, we consider that the Minister was fully entitled to require in the NZCPS that particular parts of the coastal environment be protected from the adverse effects of development.

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[76] A fact-dependent issue not explored here is CO_2 from natural gas extracted or processed at one offshore installation and injected at another.

[77] See Severinsen (2017) pp 133, 134.

[78] [2014] NZSC 38.

In respect of CCS in the coastal marine area, the NZCPS offers a reasonably neutral policy context. It does not refer directly to greenhouse gas emissions reductions or carbon capture and storage, but that need not be a concern. Its Policy 23 on the discharge of contaminants has a focus on water quality and the sensitivity of receiving environments, and provides for the management of discharges to seawater that are difficult environmentally, and beside which the geological sequestration of CO_2 looks quite benign. Regional councils must make their regional policy statements and regional coastal plans in accordance with the NZCPS.

It is recommended that the NZCPS include provision for CCS, but it should be noted that there has been no practice of making occasional amendments to it and an *ad hoc* amendment for CCS is unlikely.

The general policy framework of the RMA, described above, applies to the management of the coastal marine area, subject to the specific provisions and instruments. For coastal marine area CCS resource consent decisions, a consent authority can therefore now consider the positive effects of CCS in reducing the emissions of greenhouse gases to the atmosphere.

5. Matters Relevant to Deciding a CCS Resource Consent in the Coastal Marine Area

The basic framework for the matters to be taken into account in deciding on an application for a resource consent (specifically a coastal permit) for CCS injection in the coastal marine area is that of the RMA generally, in section 104, described above; effects, policies and plans, any other matters, all under the general purpose and principles of the Act. To that are added additional considerations for dumping, especially in section 138A, and for coastal marine area issues generally, such as in section 107 and in the Regulations. Regional coastal plans made by regional councils are relevant, but the NZCPS is important as laying down the basic policy guidance that must be considered.

6. Summary as to the Coastal Marine Area

For the reinjection scenario in the coastal marine area, the law is not very clear. It is arguable that CCS is dumping that is not prohibited and for which a resource consent (a coastal permit) can be obtained. However, it may be dumping that is prohibited (especially if natural gas is not considered to be a seabed natural resource); or it may not be dumping at all (especially if it is considered to be disposal of waste from normal operations) but a discharge under section 15B, for which a consent can be obtained.

As for the third-party CO_2 scenario, it is reasonably clear that CCS is dumping that the Regulations make a prohibited activity and cannot be authorized.

The NZCPS gives a neutral policy context for a decision on granting a coastal permit.

C. The Exclusive Economic Zone Act

1. The Exclusive Economic Zone

The Exclusive Economic Zone or EEZ is that area of the sea beyond the territorial sea out to 200 nautical miles from the baselines along the shore. (The extended continental shelf and

areas beyond it and the EEZ are not considered separately here.) The RMA does not apply in the EEZ and the regional councils have no role in its administration; the Environmental Protection Authority has that role.

As the previous section of this report did in relation to the coastal marine area, this section will concentrate on the "reinjection" scenario and the "third-party CO_2" scenario.

The controlling legislation is the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 ("EEZ Act"). The main provisions of the EEZ Act and regulations that are relevant here are:

- Section 4 defining dumping[79] (note that it is different from the RMA definition);
- Section 20 imposing a general prohibition on activities without a marine consent;
- Section 20B on the discharge of a harmful substance;
- Section 20G on the dumping of waste;
- Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015.

The general requirement that activities be approved is in section 20, that no person may undertake a listed activity unless it is classified as a permitted activity or is authorized by a marine consent. However the discharge of harmful substances and the dumping of waste or other matter are restricted separately. On the list of activities that need permission are "the deposit of any thing or organism in, on, or under the seabed" which must include CCS. The list also includes the construction of offshore structures and submarine pipelines, but they are not separately considered here.

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[79] The definition of dumping in s 4 is:

dumping—

(a) means—
  (i) any deliberate disposal into the sea of waste or other matter from ships, aircraft, and structures at sea; and
  (ii) any deliberate disposal into the sea of ships, aircraft, and structures at sea; and
  (iii) any storage of waste or other matter in the seabed and the subsoil of the seabed from ships, aircraft, and structures at sea; and
  (iv) any abandonment or toppling at site of structures at sea for the sole purpose of deliberate disposal; but

(b) does not include—
  (i) the disposal into the sea of waste or other matter incidental to, or derived from, the normal operations of ships, aircraft, and structures at sea and their equipment, other than waste or other matter transported by or to ships, aircraft, and structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such waste or other matter on such ships, aircraft, and structures; or
  (ii) placement of matter for a purpose other than the mere disposal of the matter, but only if the placement is not contrary to the aims of the 1996 Protocol to the London Convention; or
  (iii) abandonment in the sea of matter (for example, cables, pipelines, and marine research devices) placed for a purpose other than the mere disposal of it; and

(c) does not include the disposal or storage of waste or other matter directly arising from, or related to, the exploration, exploitation, and associated offshore processing of seabed mineral resources …

Permitted activities are defined in Regulations.[80] They do not include CCS, but they do include marine scientific research and seismic surveys, defined in ways that could include CCS evaluation activities.

2. Reinjection in the EEZ

Dumping. The definition of "dumping" in section 4 of the EEZ Act includes any storage of waste or other matter in the seabed and the subsoil of the seabed from structures at sea. As under the RMA, this is broad enough to include CCS unless some exception applies. If the operation is dumping, it is subject to section 20G of the Act, and is prohibited unless it is authorized by a marine consent, pursuant to regulations.[81] The Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 deal with CCS expressly in regulation 33:

> Dumping of any of the following is classified as a discretionary activity under the Act: …
> (d) carbon dioxide streams from carbon dioxide capture processes for sequestration:

CCS in the EEZ is therefore dumping and a discretionary activity (unless some exception applies), so that a marine consent is required and may be applied for under the Act. (It is notable that this is the only direct reference to CCS in the RMA or EEZ legislation.)

Exceptions to the definition of dumping. In the definition of dumping, there are two exceptions to be considered.[82] The first is in paragraph (b)(i) of the definition, the disposal into the sea of waste or other matter incidental to or derived from the normal operations of ship, aircraft, and structures at sea and their equipment, with certain exceptions. The wording of the paragraph is difficult but it can definitely be ruled out for CCS because it only concerns disposal "into the sea". The drafting of the definition as a whole suggests that the reader can take that restriction at face value.[83]

The second exception, in para (c) of the definition, is for the disposal or storage of waste or other matter directly arising from, or related to, the exploration, exploitation, and associated offshore processing of seabed mineral resources. It seems likely that this covers reinjection from the offshore processing of natural gas. The one difficulty is the meaning of "seabed mineral resources" which may only mean resources on or near the seabed, not deep below it. As was the case with the RMA Regulations discussed above, there is a good but not conclusive case for arguing that natural gas is intended to be included in "seabed mineral resources". If so, the exception in paragraph (c) of the definition applies, and CCS by reinjection is not dumping. If that argument does not prevail, then CCS by reinjection is dumping, and regulation 33 applies to it so that it is a discretionary activity.

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[80] Exclusive Economic Zone and Continental Shelf (Environmental Effects—Permitted Activities) Regulations 2013.

[81] In the EEZ Act s 20G, the relevant restriction seems to be that no person may dump waste or other matter into or onto the continental shelf, because the other restriction is on dumping into the sea, within the EEZ. The Act defines continental shelf with reference to the Continental Shelf Act 1964 where it is defined as "the seabed and subsoil of those submarine areas that extend beyond the territorial limits of New Zealand, throughout the natural prolongation of the land territory of New Zealand, to the seaward-side boundaries".

[82] In the coastal marine area under the RMA, there is the possibility of activity that is dumping but not

[83] The exception is parallel to that discussed above in the RMA s 2 definition of dumping, but there the exception was not restricted to disposal into the sea.

Discharge. If CCS reinjection is not dumping, especially because the natural gas in issue is classified as seabed mineral resources, it is a "discharge". Section 4 defines a discharge to include "any release, disposal, spilling, leaking, pumping, emitting, or emptying".[84]

The provisions for discharges in the EEZ Act are particularly aimed at the discharge of "harmful substances" but it does not seem that CO_2 falls into that category.[85] The Regulations define "harmful substance" to mean any of the following: "(a) a substance that is ecotoxic to aquatic organisms and is hazardous for the purposes of the Hazardous Substances (Minimum Degrees of Hazard) Notice 2017: (b) oil: (c) garbage: (d) sediments from mining activities other than petroleum extraction."[86] Only item (a) seems to be in play here, and it requires the substance to be both "ecotoxic to aquatic organisms" and hazardous for the purposes of the Hazardous Substances (Minimum Degrees of Hazard) Notice 2017. As for the first of these, it is likely that, as a matter of fact, CO_2 does not have the characteristics that the legislator had in mind. As for the Notice of 2017, it has been revoked without the Regulations having been updated, and apparently it is replaced by the Hazardous Substances (Hazard Classification) Notice 2020.[87] The result is that CO_2 is unlikely to be a harmful substance and section 20B is unlikely to apply to reinjection.

Paradoxically, the discharge of a harmful substance down a petroleum well is a permitted activity under the Regulations if it was generated during or used for the operation of an offshore installation.[88] The provision may have been intended to deal with drilling mud and other fluids used in drilling and well operations, but its words can be read to include CO_2 reinjection. To take advantage of this one would be obliged to describe CO_2 as harmful rather than not harmful. Even if a factual base could be found to do so, a regulator may be reluctant to agree that this provision was intended to authorize CCS operations.

The fact that CO_2 is not a harmful substance also means that section 20B and 20C of the Act and regulation 20 of the Regulations, concerning discharges from structures and from mining activities, do not apply.

The result is that if CCS by reinjection in the EEZ is a discharge, although not a discharge of a harmful substance, it is controlled by the general restriction in section 20, that no person may undertake the deposit of anything in, on, or under the seabed, unless it is a permitted

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[84] Section 4 also states that discharge does not include dumping, so that a disposal must be one or the other.

[85] Section 20B forbids the discharge of a "harmful substance" from a structure or a submarine pipeline into the sea or into or onto the seabed, unless it is a permitted activity, authorized by a marine consent, or allowed by ss 21, 22 or 23 (which concern existing activities). Note also s 20A providing a description of how the Act regulates discharges into the EEZ and into or onto the seabed from structures and pipelines.

[86] Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015, reg 4 (line breaks removed).

[87] This point and the content of the Notice have not been pursued at this stage.

[88] Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 reg 15: "The discharge of harmful substances described in regulation 4(a) and (b) into a petroleum well (being a discharge into the seabed or continental shelf) that are generated during or used for the operation of an offshore installation is classified as a permitted activity under the Act if the conditions set out in subclause (2) are complied with." The main condition is that none of the discharge occurs in the water column; the rest are for record keeping and reporting. It does not apply to the discharge of a harmful substance that involves hydraulic fracturing. Also see reg 21 about the discharge of harmful substances contained in drilling fluids, other than down a well.

activity or is authorized by a marine consent.[89] For an application for a marine consent, it is classified as a discretionary activity, under section 36.[90]

Consequences of the distinction between dumping and discharge. If CCS by reinjection is dumping then, as noted above, it is a discretionary activity, but it is not listed in the Regulations as a non-notified activity. It is the same classification if CCS is a discharge. The matters to be taken into account differ and are noted below.

3. Third-party CO_2 in the EEZ

The second scenario is third-party CO_2, that is, CO_2 other than what is separated from natural gas on the platform. It appears that CCS for this CO_2 would be dumping that requires a marine consent. If we return to the definition of "dumping" in section 4 of the EEZ Act we find the term defined primarily as "any deliberate disposal into the sea of waste or other matter from ships, aircraft and structures at sea; and … any storage of waste or other matter in the seabed and the subsoil of the seabed from ships, aircraft, and structures at sea". The exceptions discussed above for reinjection do not apply, because this scenario is for CO_2 that is not the disposal of matter incidental to the normal operation of the structure and not the disposal of matter directly arising from the exploitation of seabed mineral resources.[91] It is waste transported to a structure for the purpose of disposal, and therefore outside the exception.

Because the injection of third-party CO_2 is a dumping of waste, section 20G applies and prohibits it unless it is authorized by a marine consent, pursuant to regulations. Regulation 33, quoted above applies to dumping of carbon dioxide streams from carbon dioxide capture processes for sequestration. The CCS injection of third-party CO_2 in the EEZ is therefore dumping and a discretionary activity. The consequence is that a marine consent is required for the activity and may be applied for under the Act.

4. Taking Climate Change into Account under the EEZ Act

Section 59(5) declares that in considering the grant of a marine consent the decision-maker must not have regard to the effects on climate change of discharging greenhouse gases into the air. This is the same as the provision inserted into the RMA in 2004, discussed above. However the provision endures in the EEZ Act even though it has been removed from the RMA. This prevents the consideration of the one single merit of CCS, and prevents it from being weighed in the balance as a positive effect on the environment, against any possible adverse effects of a CCS project. However it is not an absolute bar against CCS; other projects such as a petroleum exploration well have no positive effects on the climate or on the environment generally, but are still able to get their marine consents. It is recommended that section 59(5) be repealed to remove this anomaly from the EEZ Act as it has been from the RMA.

Section 5ZN of the Climate Change Response Act 2002 probably allows EEZ Act decision-makers to take into account the 2050 emissions target, the emissions budgets, and the

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[89] Section 20(2)(f) specifies "the deposit of any thing or organism in, on, or under the seabed".

[90] The Regulations do not classify CCS as permitted, discretionary, or prohibited.

[91] Possibly CO_2 from another offshore field, with offshore processing, could be excepted and therefore not be dumping.

emissions reduction plan, as discussed above,[92] and it can have an effect on decision-making if section 59(5) is repealed.

5. Adaptive Management in the EEZ

Adaptive management is expressly contemplated in the consenting regime of the EEZ Act, but the Act declares that it is not available for a marine dumping consent or marine discharge consent.[93] The matter was considered by the Supreme Court in *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board*.[94] The Court held that the marine consent authority had adopted too narrow an approach to what constituted adaptive management; it was more than conditions for a project to be wholly discontinued as a result of the assessment of effects on the environment. But the conditions that had been imposed in the marine consent in issue did not constitute adaptive management. It would only be adaptive management if it resulted in changes in the "consent envelope," that is, the scope of activities permitted. The basic problem was that the applicant had not provided adequate baseline information in a number of respects, so the consent authority could not properly assess the proposed activity, and the applicant could not fill that gap by proposing monitoring after a consent was issued but before operations began, to be followed by management plans.

The result of the prohibition of adaptive management for marine dumping or discharge consents is a reduction in the flexibility that might otherwise be available for the consenting of a CCS project. The London Protocol appears to be the reason why adaptive management was prohibited, even though the Protocol itself does not prohibit it.[95] It is recommended that the EEZ Act be amended to allow adaptive management options to be considered to the extent possible consistent with the Protocol.

6. The Post-Injection Period

As under the RMA, the EEZ Act presents a question of dependable legal authority for the closure period. During the injection of CO_2, the operator will need to hold a marine consent, under which obligations can be imposed, but satisfactory regulation is also required for the post-injection period, when the operator may not hold a consent. Just as with the RMA, the answer seems to be a condition for a bond, under sections 63 and 65 of the EEZ Act. The bond may secure the ongoing performance of conditions relating to long-term effects, including the removal of structures, ongoing monitoring of long-term effects, and work for remedial, restoration or maintenance purposes. There is a clear emphasis on obligations that continue past the expiry of the consent, and on the long term. As under the RMA, consent conditions accompanied by a bond may be sufficient, but they may leave gaps in the regulatory regime for the post-injection period.

However an amendment to improve regulation for this post-injection period is desirable, just as it is for the RMA. It is therefore recommended that a power be inserted to make regulations, notwithstanding other provisions of the Act, for the post-injection period,

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[92] The statutory context is different from that in *Students for Climate Solutions Inc v Minister of Energy and Resources* [2022] NZHC 2116.

[93] EEZ Act ss 61(3), 61(4), 63 and 64.

[94] [2021] NZSC 127, paras 10, 199-213, 281-283.

[95] *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2021] NZSC 127, para 84 footnote 146. Reference is also made there to the MARPOL convention. The drafting of an amendment that conforms to these instruments has not been investigated here.

authorizing a marine consent to be issued for longer than 35 years, for it to be compulsory for the company to hold it even after injection has ended, and with a range of financial assurance options.

7. Policy Settings for the EEZ

The Act starting at section 37A provides for the making of EEZ policy statements which would state objectives and policies to be taken into account by decision-makers. It is evident that there can be more than one EEZ policy statement relevant to a particular matter,[96] and not only relevant to different parts of the EEZ, so it appears that there can be policy statements on different matters. A statement on CCS could contain useful guidance and direction to the making of decisions on CCS projects.

However, so far no EEZ policy statement has been made, neither generally nor on any particular matter, so their role is not readily predicted. A proposal for a statement for CCS might be met with the response that policymaking for the EEZ should be integrated, bringing in all aspects of EEZ and oceans policy generally before addressing specific kinds of project. That would become complex and time-consuming. It is recommended nonetheless that the possibility of a CCS EEZ policy statement be explored.

Separately, it should also be noted that the classification of CCS as a discretionary activity in the Discharge and Dumping Regulations (noted above) provides a policy picture for the exercise of statutory powers that unequivocally recognizes and provides for CCS in the EEZ.

8. Matters to be Taken into Account in Deciding on a CCS Marine Consent

In *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board*[97] the Supreme Court decided on the correct approach to marine discharge and marine dumping consents under the Act, and it needs to be considered before we turn to the Act's listing of matters to be taken into account by the decision-maker. The purpose provision in section 10 provides an over-arching framework for decision-making under the Act, and to that extent it has substantive or operative force. Especially relevant to discharges and dumping was section 10(1):[98]

> The purpose of this Act is—
> (a) to promote the sustainable management of the natural resources of the exclusive economic zone and the continental shelf; and
> (b) in relation to the exclusive economic zone, the continental shelf, and the waters above the continental shelf beyond the outer limits of the exclusive economic zone, to protect the environment from pollution by regulating or prohibiting the discharge of harmful substances and the dumping or incineration of waste or other matter.

The purpose in relation to discharge and dumping, then, is to protect the environment.[99] Section 10(1)(b) was held to create an environmental bottom line in the sense that, if the environment cannot be protected from harm through regulation, then the discharge or dumping activity must not occur. The criteria in section 59 must be weighed up in a way that

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[96] EEZ Act s 59(3).

[97] [2021] NZSC 127, paras 3-7.

[98] EEZ Act s 10. The definition of "sustainable management" is very similar to that in the RMA.

[99] Protection is also implicit in s 11 stating that the Act enables the implementation of New Zealand's international legal obligations.

achieves both the section 10(1)(a) and 10(1)(b) purposes.[100] To meet the bottom line in section 10(1)(b), conditions may provide for mitigation or remediation. Thus a decision-maker must follow a three-step test when assessing applications for marine discharge and dumping consents.[101]

(a) Is the decision-maker satisfied that there will be no material harm caused by the discharge or dumping? If yes, then step (c) must be undertaken. If not, then step (b) must be undertaken.
(b) Is the decision-maker satisfied that conditions can be imposed that mean:
    (i) material harm will be avoided;
    (ii) any harm will be mitigated so that the harm is no longer material; or
    (iii) any harm will be remedied within a reasonable timeframe so that, taking into account the whole period harm subsists, overall the harm is not material?
    If not, the consent must be declined. If yes, then step (c) must be undertaken.
(c) If (a) or (b) is answered in the affirmative, the decision-maker should perform a balancing exercise taking into account all the relevant factors under s 59, in light of s 10(1)(a), to determine whether the consent should be granted.

Avoidance of material harm (or its mitigation or remediation) is therefore something of a gateway test.

If the third step in the test, step (c), is reached then section 59 is applied, as the main instruction to decision-makers about the matters to be taken into account in deciding on the application. The section is long but it can be summarized as directing that the marine consent authority in deciding applications for marine consents generally must take into account:

- Effects on the environment or existing interests
- Effects on human health
- The importance of protecting biodiversity, rare and vulnerable ecosystems, and the habitats of threatened species
- Economic benefits, efficient use and development of natural resources, and best practice in relation to an industry or activity.

For marine discharge consents the list is slightly modified as to human health: section 59(2A). For marine dumping consents it is modified as human health, and by removing economic benefits, efficient use and best practice from consideration, and by requiring consideration of alternative methods of disposal of the waste, and of whether there are practical opportunities to reuse, recycle or treat the waste: section 59(2B). The marine consent authority must also have regard to any advice received from the Māori Advisory Committee (section 59(3)(c)), and it is subject to the Act's information principles stated in section 61.

Overall, sections 10 and 59 present a regime where protection of the environment has primacy but where it may well be possible for an application for a CCS operation to show that there will be no material harm caused to the environment by the discharge (reinjection) or dumping (third-party CO_2), and if there is a possibility of harm then it can be avoided, mitigated or remedied by conditions; that there will be no significant effects on the environment, human health, biodiversity and threatened species; and (in the case of discharges) that there are positive economic benefits and efficient use of resources. There is no barrier to CCS.

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[100] This is different from the interpretation of the RMA in *Environmental Defence Society v NZ King Salmon Co*, [2014] NZSC 38 where the purpose of the Act was not allowed to undermine the clear intentions of the NZ Coastal Policy Statement. *Trans-Tasman*, here, concerns the statutory identification of matters to be taken into account, rather than a policy statement.

[101] Para 5.

9. Summary as to the EEZ

In the EEZ, for the reinjection scenario, CCS is likely not to be dumping (if the natural gas is a seabed mineral resource, and not of harmful substances), but a discharge, which is a discretionary activity. The other possibility is that it is dumping which is also a discretionary activity, but with different procedural requirements and matters to be taken into account.

In the EEZ, for the third-party CO_2 scenario, CCS is clearly dumping and a discretionary activity.

The policy framework for obtaining a marine consent for CCS is relatively neutral.

D. CCS at Sea: Summary and Recommendations

Reform purposes. This analysis has shown that there are a number of legal complications and anomalies for CCS under the RMA and the EEZ Act. Two main purposes can be pursued to reform it.

(i) Update the two Acts (and the Regulations) to incorporate the 2006 amendments to the London Dumping Protocol that provided that CCS is a form of dumping that can be approved if it conforms to the stated requirements. It is an anomaly, and a significant impediment to carbon removals by CCS, that this amendment has not been implemented in New Zealand national law. It is particularly anomalous when the Dumping Protocol is the reason why these provisions are in the two Acts in the first place.

(ii) Clarify the legislation, which at present is often obscure to a degree that goes well beyond the ordinary complexity of statutory interpretation.[102]

Reform options. The ideal for any reform is an integrated package that resolves multiple issues and avoids creating new problems, but the full analysis, consultation and discussion that is required can be time-consuming. In this case the background of international obligations would have to be fully examined as well as national concerns and the interests of multiple parties. While that option can remain open for the future, the option for the short and medium term, in order to encourage early consideration of CCS possibilities, is amendments that deal with the specific question of adopting the Dumping Protocol and providing for CCS; and that is what is proposed here.[103] It may be less elegant and comprehensive than a full-scale reform, but it deals with the particular issue with a low likelihood of creating new problems.

Recommended amendments. Similar amendments are required for the RMA and EEZ Act and their Regulations; to clarify that CCS is dumping, and that it is permissible as a discretionary activity for which a permit can be applied for and obtained.

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[102] A few examples: the exception from an exception in the definition of dumping in the EEZ Act para (b)(i) (which fortunately is not a CCS problem because it is disposal "into the sea"); key terms not defined, eg seabed, normal operations; relationships between different provisions or arms of provisions often unclear (eg RMA ss 15A and 15B, qualifying clauses that are unclear what they apply to); and gaps (eg waste disposed of not into the sea, substances not harmful).

[103] To be noted is that the Natural and Built Environment Bill does not reform the corresponding RMA sections.

It is recommended that in both Acts the definition of "dumping" is amended by adding CCS to it, in the terms provided for by the 2006 Amendment of the London Dumping Protocol, making it clear that this addition is not subject to any restrictions that may be found in other parts of the definition, and making it clear that it applies to CO_2 from any source.

It is recommended that the Resource Management (Marine Pollution) Regulations 1998 and the Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 are also amended, to conform to the London Dumping Protocol, and to classify CCS dumping as a discretionary activity.

These recommendations can be illustrated as follows, to clarify the policy discussion.[104]

The RMA can be amended in the section 2 definition of dumping, by using the words of the Dumping Protocol amendment to add a paragraph (c):

> **dumping** means,—
> (a) in relation to waste or other matter, its deliberate disposal; and
> (b) in relation to a ship, an aircraft, or an offshore installation, its deliberate disposal or abandonment;—
> but does not include the disposal of waste or other matter incidental to, or derived from, the normal operations of a ship, aircraft, or offshore installation, if those operations are prescribed as the normal operations of a ship, aircraft, or offshore installation, or if the purpose of those operations does not include the disposal, or the treatment or transportation for disposal, of that waste or other matter;
> (c) notwithstanding the preceding clauses of this definition, the disposal of carbon dioxide streams from carbon dioxide capture processes for sequestration, if the disposal is into a sub-seabed geological formation, the streams consist overwhelmingly of carbon dioxide (although they may contain incidental associated substances derived from the source material and the capture and sequestration processes used), and no wastes or other matter are added for the purpose of disposing of those wastes or other matter;
> and **to dump** and **dumped** have corresponding meanings …

The RM Marine Pollution Regulations can be changed by adding CCS to the "white list" in Reg 4(2) of waste or other matter the dumping of which is deemed to be a discretionary activity:

> (h) notwithstanding reg 4(3)(a) below, carbon dioxide streams from carbon dioxide capture processes for sequestration, if the disposal is into a sub-seabed geological formation, the streams consist overwhelmingly of carbon dioxide (although they may contain incidental associated substances derived from the source material and the capture and sequestration processes used), and no wastes or other matter are added for the purpose of disposing of those wastes or other matter.

The EEZ Act can be amended in section 4 by adding to the definition of dumping:

> (d) means, notwithstanding paragraphs (a), (b), and (c) above, the disposal of carbon dioxide streams from carbon dioxide capture processes for sequestration, if the disposal is into a sub-seabed geological formation, the streams consist overwhelmingly of carbon dioxide (although they may contain incidental associated substances derived from the source material and the capture and sequestration processes used), and no wastes or other matter are added for the purpose of disposing of those wastes or other matter;

The EEZ Discharge and Dumping Regulations can be changed by adding CCS in Reg 33:

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[104] These illustrations do not supplant the parliamentary drafting process; and in reading them one should not overlook the need for various consequential amendments to ensure that the desired outcome is achieved. However there may be no need to amend the RMA s 15A or EEZ Act s 20G.

> Dumping of any of the following is classified as a discretionary activity under the Act: …
> (d) carbon dioxide streams from carbon dioxide capture processes for sequestration, if the disposal is into a sub-seabed geological formation, the streams consist overwhelmingly of carbon dioxide (although they may contain incidental associated substances derived from the source material and the capture and sequestration processes used), and no wastes or other matter are added for the purpose of disposing of those wastes or other matter;

Policy Settings and other reforms. Other reforms are also recommended.

It is recommended that section 59(5)(b) of the EEZ Act be repealed, so that the positive value of avoiding discharge of greenhouse gases to air is taken into account in making EEZ Act decisions. The continued existence of the provision is clearly anomalous, because it should have been removed in 2020 when the equivalent provisions were removed from the RMA.

It is recommended that sections 61(3), 61(4), 63 and 64 of the EEZ Act be amended to allow an adaptive management approach to be available for CCS to the extent possible consistent with the London Dumping Protocol.

It is recommended that the New Zealand Coastal Policy Statement be amended, and that a new National Policy Statement on Carbon Capture and Storage be made, to improve the policy framework for resource consent decisions for CCS in the coastal marine area.

It is recommended that an EEZ Policy Statement be explored to improve the policy framework for marine consent decisions for CCS.

IV. Crown Minerals Act

A. Purpose of the Act

The purpose of the Crown Minerals Act 1991[105] (CMA) does not include CCS or allow room for climate change considerations: "The purpose of this Act is to promote prospecting for, exploration for, and mining of Crown owned minerals for the benefit of New Zealand." The section goes on to say that to this end the Act provides for the efficient allocation of rights to prospect, explore for, and mine those minerals, effective management of those rights, activities under those rights, and a fair financial return to Crown for its minerals.

This has recently been considered by the High Court in relation to the mitigation of climate change in *Students for Climate Solutions Inc v Minister of Energy and Resources*.[106] The applicant argued that climate change should have been considered in making decisions to grant petroleum exploration permits under the CMA. The case failed mainly because climate change issues were legally irrelevant considerations that could not be taken into account in the administration of the CMA. The CMA decision maker had no role to make a decision about the damaging effects of fossil fuels. "Decision-making under the Act must be consistent with its purpose, and the purpose of the CMA is to promote mining." The Judge saw that there

[105] Section 1A(1), inserted in 2013. See the 2013 Report p 45.

[106] [2022] NZHC 2116, especially paras 62 and 73.

were decisions to be made about climate change, but he was clear that Parliament did not intend them to be taken under the CMA. The case is relevant to CCS in showing that CMA decision-making must stick to the considerations spelled out in the Act, and in particular to the stated purpose of promoting mining. Its reasoning would apply to an attempt to use CMA powers for CCS for climate change purposes just as it did to an attempt to restrict mining on climate change grounds.

The Government has introduced a Bill to amend the purpose, in light of this decision.[107] It proposes that the main statement be "The purpose of this Act is to manage prospecting for, exploration for, and mining of Crown owned minerals for the benefit of New Zealand." The Bill makes other changes that are not relevant here. (What would have been relevant, and useful to CCS, would have been a statement of an intention to contribute to the effective management of New Zealand's subsurface resources.)

B. Activities Addressed under the Crown Minerals Act

The activities that the Crown Minerals Act controls do not include CCS; the Act neither prohibits nor permits CCS. "Mining operations" include the deposit or discharge of any material produced from or consequent on the operations, but this is incidental to the basic rights to granted under permits for prospecting, exploring and mining as those activities are defined. (The Act treats petroleum production as a form of "mining.")

A mineral to which the Crown Minerals Act applies must be "a naturally occurring inorganic substance beneath or at the surface of the earth"[108] Carbon dioxide that is obtained by gas processing, or capture from industrial combustion, and held in pipes and other containers, does not appear to fall within this definition. Nor does it fall into the Act's definition of petroleum, even though that definition includes naturally occurring mixtures of hydrocarbons and one or more of hydrogen sulphide, nitrogen, helium or carbon dioxide.[109] Nor does CCS come within the Act's reference to storage in its definition of petroleum. As a result, permits for CCS operations cannot be issued under the CMA, and CMA permits do not give their holders the right to carry out CCS operations except where they are related to mining operations. The corollary, however, is that the CMA does not prohibit or regulate CCS operations.[110]

Amendments of the Crown Minerals Act 1991 in recent years have not made any real change to the application of the Act to CCS. The main amendments have been the Crown Minerals (Petroleum) Amendment Act 2018 that prevented new permits from being issued for petroleum outside the onshore Taranaki region; the Crown Minerals Amendment Act 2019 that tightened the restrictions on changes of control of a permit holder company; and the Crown Minerals Amendment Act 2021 that introduced new requirements for petroleum infrastructure decommissioning.

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[107] Crown Minerals Amendment Bill, introduced 23 November 2022.

[108] Crown Minerals Act 1991 s 2. The definition goes on to include certain other classes, eg metallic and non-metallic minerals and fuel minerals, but they must all fall into this general category.

[109] The definition is centred on naturally occurring mixtures of hydrocarbons, so that the reference to other gases is probably intended to address impurities. It is cannot reasonably be stretched to include a mixture of gases that is primarily carbon dioxide, especially if it is not a naturally occurring mixture.

[110] 2013 Report p 49.

In brief, carbon dioxide does not fall into the definition of "mineral", and CCS does not fall into the meaning of the central concepts of taking, winning and extracting minerals.

C. Enhanced Oil Recovery, Reinjection, and Gas Storage

The legal regime of the Crown Minerals Act extends to injection, reinjection and enhanced oil or gas recovery, but only insofar as they are incidental or conducive to mining operations.

Injection and reinjection are now referred to in section 89D in relation to decommissioning; and the definition of mining operations in section 2 includes the separation and discharge of any material produced from or consequent on mining operations. Well stimulation operations are referred to in the Crown Minerals (Petroleum) Regulations 2007, reg 34B. These references all concern activities incidental to petroleum extraction. The approval of activities under the Act is also subject to the general necessity of pursuing the purpose of promoting prospecting for, exploration for, and mining of Crown-owned minerals. Conditions imposed on permits under section 25, for example, must pass that test. Activities that are part of "good industry practice" referred to in section 1A must also past that test. Such operations and activities may have benefits in CCS sequestration, but the Crown Minerals Act is not directed to regulating them.

It is possible that there will be occasions where an operation can be planned to involve both petroleum production under the CMA and CO_2 sequestration, or where different operations are planned in a sequence involving both; or where facilities will serve dual purposes. There may be cases where it is desirable for regulatory action under the CMA to include requirements that accommodate CCS, but are not entirely essential for petroleum production purposes. (Possible examples are: the design of a well to be suitable for CCS injection as well as petroleum recovery, the plugging and abandonment of a well to ensure security of CO_2 storage as well as regular petroleum purposes; and the deferral of decommissioning where there is a reasonable prospect of repurposing a facility for CCS.) There could be an objection to such requirements, arguing that they are beyond the powers conferred on regulators by the Act. That would be an undesirable limitation. It is therefore recommended that the CMA be amended to authorize the Minister to take into account the desirability of CCS associated with CMA operations, notwithstanding the purpose or any other provision of the Act. Indeed reform could go further and require NZPAM to take the desirability of CCS into account.

Underground gas storage facilities are contemplated by the Crown Minerals Act; they are defined in section 2 as "a natural reservoir into which petroleum is injected in a gaseous state for subsequent extraction". Gas storage facility injection and extraction of petroleum are "mining" with a similar provisions for "mining operations".[111] However these provisions do not apply to CCS; the injection must be of petroleum as defined in section 2, and that definition cannot reasonably be extended to a CO_2 stream;[112] Nor can CCS be described as injection for subsequent extraction; and decisions taken in relation to gas storage must conform with the statutory purpose of promoting the mining of Crown-owed minerals.

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[111] Crown Minerals (Petroleum) Regulations 2007, reg 40, requires an annual report on the operation of an underground gas storage facility.

[112] The furthest that the definition of petroleum in s 2 goes is to include "(c) any naturally occurring mixture of 1 or more hydrocarbons (other than coal) whether in a gaseous, liquid, or solid state, and 1 or more of the following, namely hydrogen sulphide, nitrogen, helium, or carbon dioxide". But the definition as a whole is clearly centred on naturally occurring hydrocarbons, and it seems inevitable that this reference to other gases would be understood to refer to impurities in a fluid that is mostly hydrocarbons.

D. Crown Minerals Act Authority for Subsurface Activities

Section 57 excepts prospecting, exploration and mining from the requirements to obtain the consent of the owner to enter his or her land if it will not or is not likely: to cause damage to the surface, to cause loss or damage to the owner or occupier, to prejudice the use and enjoyment of the land, or to prejudice any possible future use of the land. CCS that is incidental to "mining" will probably have the benefit of this provision, but CCS that is not incidental to mining would not, even if the company carrying out the CCS is also engaged in mining.

An amendment of section 57 of the CMA could authorize the use of subsurface petroleum facilities for CCS purposes. However the main route forward for subsurface operations is easements obtained by compulsory acquisition if necessary by the operator as a requiring authority, as is discussed below.

E. Relationships between Different Users of the Subsurface

CCS is a novel use of subsurface formations which up until now have been of interest only to oil and gas operators. Where a CCS operator targets a structure that is included in a petroleum permit held by an oil and gas operator, the interests of the two companies may diverge, and the plans of the one company to inject or extract may conflict with those of the other. How to avoid and resolve such conflicts is a question that may need to be addressed in law reform at some point, but for the purposes of this report it is assumed that it is not an immediate concern.

Conflicting interests will not arise where it is the CMA permit holder who is embarking on CCS operations. Where they are different companies, it may be possible for them to reach a commercial arrangement satisfactory to both parties. When it becomes necessary to address conflicting interests, it will be possible to ensure neutrality between operations that have different CO_2 sources, whether they be from petroleum industry operations, other industrial sources, direct air carbon capture (DACC), or bioenergy with carbon capture and storage (BECCS).

F. Petroleum and GHG Storage Legislation Overseas

It should be noted briefly that some jurisdictions have provided for CCS by adapting their petroleum legislation. Australia provides examples, notably the Offshore Petroleum and Greenhouse Gas Storage Act, and so does Canada.[113] However we consider that New Zealand's CMA would require wholesale revision to accomplish the same reform; not only the purpose of the Act but its entire permitting system is geared to mineral exploration and extraction.[114]

G. Summary as to the Crown Minerals Act

The Crown Minerals Act does not authorize CCS operations that would otherwise require consent or approval of some kind, but it does not prevent them either. It grants rights to

[113] See p 49 of the 2013 Report.

[114] The 2013 Report p 52 recommended against this path for CCS legislation.

explore and extract in the Crown's mineral estate, and does nothing or almost nothing to authorize other activities. It is important to keep in mind that Crown Minerals Act operations are subject to the RMA or EEZ Act. Even after it has obtained a Crown Minerals Act exploration or mining permit, an oil and gas operator must still obtain resource consents for discharges of contaminants to air and water, water takes, and (probably) for land use, earthworks and other activities that can have adverse effects on the environment.[115] This puts the CCS focus more on the RMA and the EEZ Act than the Crown Minerals Act. The same goes for incursions on private property; the Crown Minerals Act cannot authorize entry for CCS that is not part of mining under the Act.

CCS by way of reinjection may require operations to be approved by NZPAM, so it is recommended that the Crown Minerals Act be amended to direct the Minister and others (acting through NZPAM) to take into account the desirability of CCS associated with CMA operations, notwithstanding the purpose or any other provision of the Act.

V. Long-Term Liability

The term "liability" is a loose one and can refer to a number of different legal issues arising out of an untoward event, and a more analytical approach to CCS liability calls for precision about who is liable to whom and for what.[116] The issues that are generally identified in the international evaluation of CCS legal issues can be marshalled in a brief way under three headings as follows, noting where they are addressed in this report.[117]

1. Civil Liability. A court may find a CCS operator liable to pay for damage done to the property of a neighbour or local authority, for trespass, nuisance, or negligence. The operator may also be impeded by injunctions. This is addressed in this report in the section concerning Property, where it is concluded that the main trespass and nuisance issues can be dealt with by a vesting of certain rights in the operator as a requiring authority. However liability in tort and contract arising out of ordinary engineering operations is not addressed because it is part of the risk management that is a well-established part of carrying out any major project. Nor has this report evaluated whether CCS has special liability characteristics due to the long-term nature of sequestration except as discussed below. It has not considered whether there is a public interest in a transfer of liability from the operator to the state as has been legislated in a number of jurisdictions.

2. Administrative Liability. The operator is covered by a number of regulatory regimes such as health and safety and environmental protection, and may be subject to compliance obligations. Again these requirements are an ordinary part of the management of major projects and they are not considered further here. Obligations under the RMA and the EEZ Act have already been examined above.

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[115] Section 9 of the CMA is confirmation.

[116] 2013 Report, Chapter 10 p 215. Similarly see Ian Havercroft and Richard Macrory, *Legal Liability and Carbon Capture and Storage: A Comparative Perspective* (Global CCS Institute, 2014).

[117] Following Havercroft, *Lessons and Perceptions* (2019) p 12.

3. Greenhouse Gas Liability. Carbon liability under the Climate Change Response Act 2002 is dealt with below in the section of this report concerning the NZETS. It seems capable of being dealt with satisfactorily under that Act.

All three of these kinds of liability are affected by the long-term character of CCS projects, which are intended to hold CO_2 securely in underground formations indefinitely. In the earlier phase of international CCS research, studies identified novel and uncertain features of CCS that led to concerns about liability, so that liability was thought to be a barrier to investment and the widespread deployment of the technology.[118] The response in a number of jurisdictions, to encourage CCS, was legislation that transferred liability from the operator to the state after injection ended and the site closure was approved. The IEA *Model Regulatory Framework* of 2010 proposed that a CCS regime should include a transfer of responsibility to a public authority, a feature that could be included in a New Zealand regime.[119]

However, perceptions of CCS liability internationally have changed as time has gone by and as experience with the technology has increased. Specific studies and modelling have produced a deeper understanding of the risk profile of the operations involved. Havercroft reports that significant developments in research and modelling demonstrate that there is now very high confidence in long-term storage security at a global scale, so that the burden of liability is now thought to be much less than predicted in earlier analyses.[120] For example, a 2018 study calculates that in a worst case scenario, with poor regulation, in a region with a high risk of leakage from abandoned wells, at least 78% of the CO_2 injected will remain trapped in the subsurface over 10,000 years.[121]

It is therefore an open question whether companies will proceed with CCS projects in New Zealand without legislation for the state to assume liability for a site at some point well after the end of injection. Not every jurisdiction offers to assume liability.[122] Companies interested in CCS may not be unduly concerned with the risk of long-term liability. There may be other ways to manage risk and the perception of risk, such as financial security measures or custom agreements and indemnities between the Crown and a company. A close analysis might show that a serious liability event such as a catastrophic failure of storage is only a remote possibility.

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[118] Havercroft, *Lessons and Perceptions* (2019) p 6.

[119] 2013 Report p 226; International Energy Agency, *Carbon Capture and Storage Model Regulatory Framework* (2010).

[120] Havercroft, *Lessons and Perceptions* (2019), pp 6, 21 and 32. In International Energy Agency, *Legal and Regulatory Frameworks for CCUS* (2022) p 67 it is noted that the risk of CO_2 leakage is very low and generally becomes even lower with time and after injection ceases, but that several jurisdictions transfer long-term liability to the state. While the matter is a key consideration for storage developers, it is not said to be an essential element of a CCS / CCUS legal framework.

[121] Juan Alcalde, Stephanie Flude et al, "Estimating geological CO2 storage security to deliver on climate mitigation" (2018) Nature Comms 9:2201, doi: 10.1038/s41467-018-04423-1.

[122] However it is common: Ian Havercroft and Richard Macrory, *Legal Liability and Carbon Capture and Storage: A Comparative Perspective* (Global CCS Institute, 2014), p 36. Transfers are often only partial and are subject to clawbacks. Further comparative analysis is desirable.

VI. Property Rights

A. Rights to the Subsurface

The carbon dioxide that a CCS operation injects into geological structures is likely to spread horizontally some kilometres or tens of kilometres, so, where the operation is carried out on land, it will enter the subsurface of the property of other landowners. It will do so at considerable depth below the surface; the CO_2 must be injected at least 800 metres below the surface. The legal consequences of that intrusion may be summarized briefly.[123] A person who owns land owns the subsurface as well as the surface, vertically downwards, indefinitely; the boundary lines are projected vertically downwards. A person who enters the subsurface without permission is guilty of trespass to land as much as if it happened on the surface.[124] This is so even if the mineral rights are privately owned or held under the Crown Minerals Act, or if the subsurface holds petroleum that is vested in the Crown. It is so even if the interference is so deep underground that the landowner was unaware of it. Nuisance, as a different cause of action, occurs if something emanates from the defendant's land and causes a continuing interference with the plaintiff's use or enjoyment of his or her land. It must be a substantial and unreasonable interference, and there must be actual or imminent harm.[125]

If a landowner goes to court complaining of trespass or nuisance, it may take time to resolve the case even if the CCS operator is ultimately successful. Especially in a trespass case, the landowner could obtain interim relief, halting work on the project until the claim is resolved. Similar delays could occur in a nuisance claim. At the end of the day the CCS operator may be successful in showing that the movement of CO_2 far below the surface is not substantial interference, and that the slow migration and leakage of CO_2 that only sophisticated instruments can perceive is not interference either, but it could take time.

One solution to these property law issues is for legislation to vest subsurface property rights in the state, whether in relation to pore space or storage capacity generally. While such a compulsory vesting option is available as a law reform option, the present discussion is directed more to the possibilities under existing legislation, which in fact seem to be quite realistic.

It should be noted that these property issues do not arise in the territorial sea or the exclusive economic zone offshore. On the other hand, as noted above, subsurface property rights questions for CCS cannot be resolved by resorting to section 57 of the Crown Minerals Act 1991 if the activity is not one of mineral exploration and extraction.

B. Requiring Authority and Designations under the RMA

A path to obtain the necessary property rights for a CCS project can be found under the Resource Management Act 1991 as it stands at present, through approval of a company as a

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[123] 2013 Report, Chapter 4 and (in relation to civil liability) Chapter 10.

[124] The law on underground trespass was recently confirmed by *Lakes Edge Developments Ltd v Kawarau Village Holdings Ltd* [2017] NZCA 205, following *Bocardo SA v Star Energy UK Onshore Ltd* [2011] AC 380, as to rock anchors holding a retaining wall which would be a trespass if they had been installed without the consent of the land owner. See S Todd (general editor), *Todd on Torts*, 8th ed (Thomson Reuters 2019) p 491.

[125] Todd p 543. Liability under *Rylands v Fletcher* is for isolated escapes.

requiring authority, which allows a CCS operator to obtain a designation under the RMA and, with ministerial approval, expropriate easement rights to inject CO_2.

The first step is for a CCS project or work to be prescribed a network utility operation within the meaning of s 166, by the making of a regulation under s 360(1)(e). Section 166 defines "network utility operator" to include persons who undertake a number of different works such as the transmission of natural gas by pipeline. CCS is not on that list, but there is a power to add to the list: a person who "undertakes or proposes to undertake a project or work prescribed as a network utility operation for the purposes of this definition by regulations made under this Act" which brings s 360 into play. (The meaning of "network utility operation" is also controlled by this section.) There is no guidance or constraint on the prescribing of a project or work except that the decision would have to be in accordance with the general purpose and principles of the RMA in Part II of the Act.[126]

The second step is for an operator of a network utility operation to apply under s 167 for the Minister to approve it as a requiring authority. The approval is granted for a particular project or work, or a particular network utility operation, so a company needs approval for CCS specially. (Even if it is a requiring authority for other operations, eg petroleum pipelines, it needs approval for CCS operations.) In deciding whether to grant the approval, the Minister may make inquiries and call for information. He or she must be satisfied that the approval is appropriate for the purposes of carrying out the operation, and that the applicant is likely to satisfactorily carry out all the responsibilities of a requiring authority (including financial responsibilities), and will give proper regard to the interests of those affected and to the interests of the environment. The Minister may require the applicant to give a bond. The Minister gives approval by notice in the Gazette, and may impose terms and conditions that restrict the circumstances in which the requiring authority can act. These provisions allow the government to ensure that the powers conferred on a requiring authority are not abused. The Minister has power to revoke the approval if the requiring authority is unlikely to satisfactorily carry out its responsibilities.

Status as a requiring authority gives a CCS operator two powers with which to further its project.

1. Designation

The first to obtain a designation, which ensures that it can proceed with the project without being subject to the rules and policies in the district plan made under the RMA by the territorial authority. Designation also helps the operator prevent any use of land in a way that would hinder the project. The procedure is for the operator to give notice to the territorial authority under s 168 of its requirement for a designation for its project or works, including the land, water, subsoil or airspace where a restriction is necessary for the project.[127] The territorial authority follows the statutory procedure for a hearing and makes a recommendation to the operator under s 171. The Environment Court hears any appeal against

[126] The Resource Management (Network Utility Operations) Regulations 2016 could be amended for this purpose. They demonstrate the prescribing of particular projects (hydro and irrigation) as network utility operations. The status of operations under s 166, or of requiring authorities under s 167, does not appear to have direct consequences under the Commerce Act 1986.

[127] Section 168(2) refers to a notice of requirement for "any land, water, subsoil, or airspace where a restriction is reasonably necessary for the safe or efficient functioning or operation" of a project, so a designation in respect of the subsurface is clearly contemplated.

the designation. Unless the requirement is cancelled by the Environment Court, the designation is confirmed and included without further process in the district plan.

How important it is for a CCS operator to obtain a designation will vary from case to case, depending on the project, the existing land base, and the existing district plan. In some cases a designation may not be necessary. Designations do not operate offshore.

2. Compulsory acquisition of property rights

The second power deriving from status as a requiring authority, and perhaps the more important one in this context, is the power to have expropriated land or interests in land such as easements. The operator applies to the Minister of Lands under s 186(1) of the RMA to have land acquired as if the project or work were a government work under the Public Works Act 1981 (PWA). For this to happen, the Minister must consider it appropriate to set in train the process under Part 2 of the PWA that could ultimately lead to a compulsory acquisition, which will have to meet the criteria in section 24(7) of the PWA.[128] The Minister must be satisfied that the requiring authority has articulated its objectives in relation to the proposed work and has considered alternatives, and that the compulsory acquisition, should it occur, would be fair, sound and reasonably necessary. If the Minister of Lands gives his or her agreement under s 186, the procedures of the Public Works Act are triggered. They are directed initially at acquisition by agreement, but provide for a notice of intention to take land to be served, objections to be heard and a report made by the Environment Court, and a proclamation made taking the land or the interest in land and vesting it in the requiring authority.[129] Compensation is determined and paid to the land owners.

The main property rights that a CCS operator would seek would be easements for pipelines, monitoring networks, underground injection, sequestration of CO_2, and underground displacement of fluids. The easements would have to cover the whole area into which it is intended to inject CO_2. Care should be taken with the re-purposing of natural gas pipelines for CCS purposes; if the easement or other authority under which they are held is only for the conveyance of petroleum, hydrocarbons, etc, then their use for carbon dioxide may not be legally authorized.[130]

What would the results be at the end of this path in respect of legal liability for trespass and nuisance? Trespass seems straightforward; if the rights taken by way of an easement are well defined, then the mere presence of injected CO_2 under a neighbouring landowner's land would not be a trespass. Trespass is a concern legally because it requires no proof of harm for liability to be established, and it is not subject to a reasonableness defence. As with pipelines, care would be needed in the re-purposing of wells, especially deviated wells, that were authorized for Crown Minerals Act purposes but not CCS. Liability for nuisance can also be

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[128] *Dromgool v Minister for Land Information* [2022] NZSC 157 analyzed the Minister's duty under s 186: see para 102. Also see *Seaton v Minister for Land Information* [2013] NZSC 42.

[129] The Environment Court's report is binding on the Crown, but the Court's jurisdiction under s 24 is restricted to a factual review of the appropriateness of the decision to expropriate as a means of giving effect to the requiring authority's objectives; it has no function of substituting objectives. It must ascertain the adequacy of consideration of alternative sites, but has no role in choosing between alternatives. It decides whether the taking would be fair, sound and reasonably necessary for achieving the requiring authority's objectives. See *Waitakere City Council v Brunel* [2007] NZRMA 235 (HC), and KA Palmer, "Compulsory Acquisition and Compensation" p 1603 at 1616 in E Toomey (ed) *New Zealand Land Law*, 3d ed (Thomson Reuters, 2017).

[130] In the 2013 Report, Chapter 8 addressed pipelines and other transport issues, but pipelines will not be dealt with separately in this report.

disposed of by a suitably-drafted easement; easements in effect authorize actions that would otherwise be trespasses or nuisances. An easement obtained under the Public Works Act (or by agreement) gives broader rights, as property rights, than a statutory approval like a resource consent, so it is different from the cases where a statutory approval does not guarantee immunity from nuisance claims.[131]

3. Māori interests in the coastal marine area

Status as a network utility operator protects the needs of CCS operator desiring to build a pipeline in a part of the coastal marine area where Māori customary interests and title have been recognized under the Marine and Coastal Area (Takutai Moana) Act 2011. "Accommodated infrastructure" includes infrastructure that is lawfully established, owned and operated by a network utility operator, and reasonably necessary for the national social or economic well-being, or the social and economic well-being of the region.[132] The obligation for the pipeline to be for social or economic well-being may present a difficulty, because environmental well-being is not mentioned separately, but it is arguable that climate change generally and the price on GHG emissions in particular are important socially and economically.

4. Requiring authority summarized

The process of obtaining requiring authority status for the operators of CCS facilities as a network utility operation therefore appears to provide a high degree of legal certainty in respect of property rights, while ensuring that landowners are compensated for any losses that they may experience, and it provides opportunities to reduce difficulties with district plans and Māori coastal interests.

It is recommended that the Resource Management (Network Utility Operations) Regulations 2016 be amended under section 360(1)(e) of the RMA for a CCS project or work (including capture facilities, pipelines and other transport facilities, injection sites, and monitoring, measurement and verification networks) to be prescribed as a network utility operation within the meaning of section 166. Individual CCS operators could then apply to the Minister for the Environment under section 167 for approval as a requiring authority.

VII. CCS and the Emissions Trading Scheme

A. Introduction

The New Zealand Emissions Trading Scheme (NZETS) was established in 2009.[133] Its basic architecture is unchanged since then, but features such as the fixed price option and the 1-for-2 discount have been removed so that it has become more effective. Its legal foundation is the Climate Change Response Act 2002, and at its centre is the identification of participants, being persons who carry out specified activities: section 54. Most of the companies obliged to

[131] See the 2013 Report p 2018, referring to *Hawkes Bay Protein Ltd v Davidson* [2003] 1 NZLR 536.

[132] Marine and Coastal Area (Takutai Moana) Act 2011 s 63, and a process under Schedule 2 for an application to be made for proposed infrastructure to be determined to be "deemed accommodated infrastructure". See p 205 of the 2013 Report.

[133] 2013 Report, Chapters 10 and 11.

surrender New Zealand Units (NZUs) are compulsory participants, carrying out one of the activities listed in Schedule 3. Schedule 3 lists the activity of "Mining natural gas, other than for export". Other participants are voluntary participants, carrying out one of the activities listed in Schedule 4; most of them are forestry owners, because forestry can be a removal activity removing GHGs from the atmosphere; but the Act contemplates other removal activities as well.

A participant is liable to surrender one NZU for each tonne of greenhouse gas emissions from each Schedule 3 or 4 activity that it carries out, as calculated in accordance with this Act: section 63. The participant must submit an annual emissions return to the EPA that includes an assessment of its liability to surrender units, and following the submission it must surrender the number of units listed there.[134] Sections 204 to 212 of the Act apply to the stationary energy sector, which includes the extraction of natural gas, but the sections mainly concern identification of participants and other parties; the more substantial details are in the Regulations.

A company extracting natural gas and selling it in New Zealand has NZETS obligations for its own activities but also acts as the point of obligation for the emissions that will result from the burning and use of its gas by consumers downstream. The general principle in most sectors is for the points of obligation to be upstream, so that the NZETS participants who must surrender NZUs are the importers and producers of fuel or electricity, rather than the large numbers of consumers downstream.

B. Reinjection and the NZETS

The Climate Change (Stationary Energy and Industrial Processes) Regulations 2009 are the key to understanding whether CCS by reinjection is subject to obligations under the New Zealand Emissions Trading Scheme.[135] Regulations 15 to 17 apply to the mining of natural gas other than for export. Regulation 16 identifies information that must be collected in relation to tonnages and qualities of mined natural gas, for the year, and from each field, that has been sold, exported, sold to opt-in parties, combusted for own use, flared, or vented.[136] In Regulation 16, the main point for measurement for gas sold is the "point of sale" which is defined in Regulation 3 as "the first fiscal meter downstream of gas processing". The quantities of gas that are combusted for own use, flared and vented are measured before the point of sale.

Gas processing operations are therefore clearly included. Gas processing is also referred to as included in the definitions of own use, flaring and venting, and there are no separate provisions in the Regulations or the Act for gas processing plants.

Regulation 17 provides for the calculation of the total emissions for each year from each field from the information collected under regulation 16. The participant's total emissions from the activity of mining natural gas other than for export so calculated are recorded in the emissions return that the participant must submit to the EPA and that is the basis for determining the

[134] CCRA s 65(1), (2) and (4).

[135] This discussion concerns CCS that could be associated with natural gas production, and does not consider the production of oil or other liquid hydrocarbons separately.

[136] Reg 16(1), (2), and (2A).

participant's obligation to surrender NZUs.[137] Under regulation 17(4), the total emissions from each field for the year are calculated with a formula that (to put it in general terms) adds emissions from each class of mined natural gas sold, gas combusted for own use, gas that is flared, and gas that is vented, and subtracts gas that is exported and gas that is sold to an opt-in participant.[138]

There is no reference in these Regulations to the injection of CO_2, reinjection, or CCS generally. Injection is mentioned only for injection into a gas storage facility and into a high-pressure transmission pipeline.[139] Gas storage facility is not defined, but it is plain that the Regulations intend to refer to the storage of natural gas and not other gases like CO_2.

It follows that the only NZETS liability of the participant is for the emissions that regulations 15 to 17 identify and require to be recorded and included in the calculations for the emissions return – essentially for the natural gas sold, combusted for own use, flared, or vented.[140] Section 63 of the Act lays down the general rule that a participant is liable to surrender NZUs for its emissions calculated in accordance with the Act. The implication is that there is no obligation to surrender NZUs for CO_2 that is disposed of by CCS before the point of sale, "behind the meter," because it is not included in those calculations. CCS by reinjection therefore appears not to require separate reporting in the NZETS. Its effect is to reduce the emissions that the company must report and for which it must surrender NZUs.

What if there is a leak from geological sequestration? The Regulations say that to "vent" gas is to release uncombusted gas into the atmosphere during the production and processing of natural gas.[141] A leak from a geological formation, particularly one that happens after the injection period has ended, is probably not included; the release was to a subsurface formation, even if the gas has migrated subsequently, and if the two events are separated in time then it is not during the production and processing of natural gas. In contrast, a leak of CO_2 to the atmosphere during injection, or directly associated with a well or other facilities, could be held to be a form of venting; the act does not need to be deliberate, and the quantity would then be included in the participant company's emissions return.

This is the general legal framework. Its implications and tentative conclusions need to be tested by an engineering analysis of the Regulations with reference to the particular circumstances of individual company facilities.

C. Third-party CO_2 and CCS as a Removal Activity

The sequestration of CO_2 by way of reinjection by a gas producer before the point of sale can be dealt with as above as a deduction from the amount of gas produced and for which NZUs must be surrendered. However for the injection of any other CO_2, credit must be obtained separately. The NZETS system provides for credits in the form of removal activities; a

[137] That obligation is under CCRA s 65(4).

[138] The point for calculating the amount of gas sold to an opt-in natural gas participant is the point of sale.

[139] Climate Change (Stationary Energy and Industrial Processes) Regulations 2009, regs 13, 14,17(2), 49, and Schedule 1.

[140] In the Stationary Energy Regulations, reg 3, "vent" is defined in relation to natural gas to mean release uncombusted gas into the atmosphere during the production and processing of natural gas, and so does not include CCS; nor are the definitions of "own use" and "flare" wide enough to catch CCS.

[141] Stationary Energy Regulations, reg 3.

participant is entitled to one NZU for each tonne of removals from its removal activities: CCRA section 64. A person carrying out removal activities listed in CCRA Schedule 4 has the option of registering as a participant. Post-1989 forestry is the main activity concerned, but another one is the production of a product that embeds a substance that would otherwise result in emissions, the main example being methanol manufacturing for export.

Schedule 4 Part 2 Subpart 2 also provides expressly for CCS, listing the activity in these terms:

> Storing of carbon dioxide after capture, where—
> (a) a person is required to surrender units under this Act in respect of the emissions that would result if the carbon dioxide was not captured and stored; and
> (b) the result of the carbon dioxide being captured and stored is a reduction from emissions reported in any emissions report provided by New Zealand under its international climate change obligations; and
> (c) any prescribed threshold is met.

This subpart is not in force; it applies only if an Order in Council is made, and it appears that none has been made thus far.[142] But it does open the door for CCS to participate in the NZETS in circumstances different from the reinjection scenario. For example, a company's operations might be such that technically it emits CO_2 that must be reported in an emissions return, but can still be captured; in that case it would have to surrender NZUs but could also obtain them for the sequestration.

The above-quoted provision in Schedule 4 is limited in that it only applies to CO_2 that would otherwise be caught by the NZETS. The policy rationale for this limitation is not clear. For example, it does not allow NZUs to be issued for DACC or BECCS, or to exempted companies. For a removal to be environmentally sound, it does not need to be a removal from one of the activities covered by the NZETS; the NZETS does not cover all sources of emissions, and it can operate without there being a connection between emissions and removals – there is none in the case of forestry. It will therefore be better for the existing listing in Schedule 4 to be replaced with a new one that is more inclusive. This can be done by an Order in Council[143] which is the action that would be required in any event to activate the existing listing.

If a new definition of CCS added to Schedule 4 and into effect with an Order in Council, it would need to be accompanied by new regulations. Regulations would be necessary to set forth the requirements for the collection of information for the purpose of calculating removals, and then for the method of calculating the removals themselves for the purposes of an emissions return, which under section 64(2) will allow the participant to receive NZUs.[144] The regulations need to be consistent with the *IPCC 2006 Guidelines for National Greenhouse Gas Inventories*.[145] In any event, as a matter of policy, care would be required with the drafting of regulations for CCS, because removals are directly a source of valuable and readily-sold assets in the form of NZUs.

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[142] CCRA s2A(14).

[143] CCRA 162.

[144] Regulations for this purpose can be modelled on those for methanol removals in the Climate Change (Other Removal Activities) Regulations 2009, regs 5-7, and on the more complex provisions for natural gas emissions in the Climate Change (Stationary Energy and Industrial Processes) Regulations 2009, regs 15-17.

[145] Dixon, McCoy and Havercroft (2015) above p 432.

The power to make regulations includes the power to set a threshold for operations that can be an "activity" and therefore subject to regulation, and for criteria for registering as a participant in relation to CCS, and in particular for criteria for "the type of carbon capture and storage" in respect of which a person may register as a participant.[146]

D. Long-term security of geological sequestration

It was noted above that in CCS policy discussions the group of issues lumped together as "liability" particularly features long-term liability for leaks from geological sequestration that compromise greenhouse gas accounting and crediting.[147] In New Zealand this matter falls to be considered under the Climate Change Response Act. Of the two scenarios, CCS by reinjection seems to be straightforward in terms of the current rules for NZETS accounting; there would appear to be no obligation for the operator to surrender NZUs for any loss from a geological structure. Whether that should continue to be the case might depend on a view on whether the escape was caused or exacerbated by the reinjection activity or whether it would have happened in any event.

The third-party CO_2 scenario is less straightforward, and depends on CCS becoming a removal activity under the NZETS. An important principle in the general design of the NZETS is the environmental integrity of the system; emissions should be accurately recorded and made subject to an obligation to surrender NZUs, and NZUs issued for removals should indeed represent removals of greenhouse gases from the atmosphere. The NZETS is not perfect, of course, and it is not the sole policy instrument with which climate change is addressed, but in the sectors where it operates it pursues system integrity by imposing detailed requirements for measurement, calculation, and compliance. One should therefore expect that NZETS regulations for CCS will include provisions to address the risk of CO_2 escaping from geological sequestration. The will do so in accordance with the *2006 IPCC Guidelines*, discussed below. The following matters are likely to arise in doing so.

- The regulations would require a CCS operator to run a monitoring, measurement and verification (MMV) program for some time after the injection operations have ended. The operator would report the results to the Environmental Protection Authority. The MMV program could include fluid movement, leak detection, and seismicity, but only for CCRA purposes.
- The CCS operator would be obliged to remain a participant in the NZETS for that time. The activity of CCS listed in Schedule 4 would be voluntary to begin with, but once the operator becomes a participant it would be obliged to stay.
- The points at which information from the MMV program justifies regulatory action would be identified, addressing uncertainty, probability, thresholds and burden of proof of sequestration failure and the necessary action.
- The operator could be obliged to carry out engineering work and other actions to contain a leak from sequestration where such actions were possible, such as around an abandoned well.
- If there is a leak of CO_2 from storage, the CCS operator will be liable to surrender NZUs. It could have an option of making good by storing an equal amount of CO_2 without receiving NZUs.

[146] CCRA s 168(1)(m) and (n).

[147] Havercroft, *Lessons and Perceptions* (2019), p 25.

- The EPA will want some assurance of the operator's long-term ability to surrender NZUs if that should be necessary; that the operator or some successor is legally bound and financially capable of meeting that obligation. Regulations can state how long it should require that assurance, and how complete it should be, in the light of current knowledge about the integrity of geological disposal systems.
- Some concerns could be addressed if the regulations included a discount for the probability of a leak, as a buffer; or the retention of a tranche of NZUs for a time, to be issued after a given threshold of stability has been reached.[148]
- It may be possible to borrow some regulatory procedures from the rules in place for forestry. CCS regulation is likely to be much simpler, for a variety of reasons, but there is a similar policy objective of ensuring that the system maintains its integrity, and ensuring that that each NZU issued for a removal does indeed represent a tonne of CO_2 removed from the atmosphere. Forestry also gives examples of mechanisms that alleviate the strictness of surrender obligations in the face of untoward events.[149]

E. GHG Inventory Reporting

New Zealand as a party to the UNFCCC and Paris Agreement makes periodic reports, especially the annual Greenhouse Gas Inventory. The format and methodology of the Inventory are governed by the *IPCC 2006 Guidelines for National Greenhouse Gas Inventories*, made by the Intergovernmental Panel on Climate Change. Annex I parties were required to use them from 2015,[150] and in 2018, as part of the Katowice Climate Package to put the Paris Agreement into operation, it was agreed that all parties, not only the developed Annex I countries, were to use the *IPCC 2006 Guidelines* and any subsequent version or refinement agreed upon by the Meeting of the Parties (CMA).[151] In New Zealand law, the Climate Change Response Act 2002 gives effect to these international rules for reporting and transparency.[152]

The *IPCC 2006 Guidelines* have a chapter for reporting the performance of CCS operations. It creates a methodology for geological storage assessment and reporting. As noted above, removals can only be claimed in a national inventory if the CCS is monitored and reported as required by the *Guidelines*. The *Guidelines* recognize that monitoring and reporting must be project-specific, and that no general set of emissions factors can be applied to CCS. They

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[148] In California amendments to the 2018 Low Carbon Fuel Standard enable CCS projects with a CCS Protocol that requires 100 years of monitoring post-injection and requires the operator to contribute between 8% and 16.4% of the credits they generate into a "buffer account" to maintain the integrity of the system. See Havercroft (2019) p 30.

[149] For example CCRA ss 193A, for temporary adverse effects affecting standard forestry and permanent forestry.

[150] Decision 24/CP.19 "Revision of the UNFCCC reporting guidelines on annual inventories for Parties included in Annex I to the Convention" (22 Nov 2013), FCCC/CP/2013/10/Add.3 (Decisions adopted by the COP). The Guidelines, IPCC, *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, are available at https://www.ipcc.ch/report/2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/.

[151] Decision 18/CMA.1, "Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement" Annex para 20 (15 Dec 2018), FCCC/PA/CMA/2018/3/Add.2 (Decisions adopted by the CMA); Decision 1/CP.24 "Preparation for the implementation of the Paris Agreement" (15 Dec 2018) paras 38-46, FCCC/CP/2018/10/Add.1 (Decisions adopted by the COP).

[152] CCRA 2002 ss 4, 9A and 32.

recognize that if injected CO_2 stabilizes as predicted then the monitoring can decrease or discontinue.[153]

It is recommended that regulations under the CCRA ensure that CCS monitoring and reporting is consistent with the inventory requirements in the IPCC *2006 Guidelines*.

F. Trading in Carbon Credits

In 2011 a new set of rules (modalities and procedures) were adopted to allow CCS to be a legitimate project activity under the Kyoto Protocol Clean Development Mechanism (CDM). Although the Kyoto Protocol and the CDM have now faded from view, these rules are widely expected to be adapted and used under the Paris Agreement when it becomes possible to deal in "internationally transferred mitigation outcomes."[154] They would become directly relevant if New Zealand CCS credits were being taken up by other countries – not an immediate prospect – but they represent a consensus about best practice that may become significant in the future.

G. Conclusions on NZETS

In theory CCS could go ahead without special provisions in the CCRA, but there would be no benefits under the NZETS. Acting in such a way might be attractive in the market for voluntary carbon credits, but most parties will have a strong preference for reducing their obligations in the compulsory NZETS market, in order to help make the business case for investing in CCS separation and injection facilities. It should be borne in mind, however, that compliance obligations under the CCRA can be demanding, and that participants need to take care to avoid incurring penalties and unexpected obligations to surrender NZUs, especially if the market price of units is rising.

It is recommended that Schedule 4 of the CCRA be amended by an Order in Council removing the existing definition of CCS as an activity, adding a new and more extensive definition, and bringing it into effect so that CCS becomes an activity in respect of which a person can become a voluntary participant in the NZETS and obtain NZUs for CO_2 sequestered; and that regulations be made to provide for CCS including long-term sequestration and the terms on which the participant will be obliged to surrender NZUs in the event of a leak from sequestration.

Some priority should be given to securing an Order in Council and new regulations, rather than simply relying on the ability that a gas producer has to reduce its carbon liability by reinjecting behind the meter. The Order in Council and new regulations will allow a range of participants to consider CCS, and a range of sources of CO_2 to be captured, and that will improve the social licence for CCS.

VIII. Competition Issues

If a situation emerges where multiple CCS operators have projects that affect each other, then legal issues arise that can be grouped together as competition issues. For example, one party

[153] Dixon, McCoy and Havercroft (2015) above p 432.

[154] Dixon, McCoy and Havercroft (2015) above p 443.

might seek access to another party's pipelines or other facilities (third party access or TPA); or it might wish to inject in a different part of a structure where the other party already has approval to inject. Similarly disputes may emerge between CCS companies and petroleum companies, as to the use of facilities and the use of geological structures. Geothermal operations may raise the same questions. These problems have been examined closely in countries such as the United Kingdom where CCS clusters are being planned,[155] and if a full-scale CCS legal regime is planned for New Zealand, there are solutions available.[156]

For present purposes, however, it is assumed that these issues do not yet present a pressing problem; it is unhelpful to look too far ahead to solve the problems of an industry that does not yet exist. In the meantime, one can expect that in many cases where the interests of parties intersect they will be able to reach a commercially realistic agreements about their projects. Anti-competitive behaviour is also constrained by the Commerce Act 1986.

Competition under the RMA is addressed by the principle of "first in, first served" which has been worked out in relation to scarce resources such as river water, marine space for aquaculture, and capacity of a river to run jetboat trips safely. The first party to lodge a complete application for a resource consent, ready to be notified, is entitled to have its application considered and decided before the late-comers.[157] It is an open question whether first-in-first-served is a suitable principle for CCS applicants competing for access to a location or for the use of the assimilative capacity of a subsurface structure. Suitable responses to that issue, along with other competition issues, is likely to become clearer as the scale and nature of CCS in New Zealand is better understood.

IX. Permitting

International guidance about law and regulation for CCS has generally suggested a system of permits for CCS:[158]

- Exploration permit, for reconnaissance and evaluation
- Injection permit, accompanied by a site plan
- Pipeline permit
- Site closure authorisation.

For each such permit, procedures would be put in place for applications to be evaluated and decided, and the permit would give its holder necessary rights for its CCS operations. The regulatory agency would oversee the activities of the permit holder and would have powers to vary permits and where necessary enforce their conditions. Thus a permit system would provide rights to carry out actions that would otherwise be unlawful, regulatory control in the public interest, the allocation of public resources, investment certainty, and ancillary rights

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[155] Benjamin Sovacool, Frank Geels and Marfuga Iskandarova, "Industrial clusters for deep decarbonization" (2022) 378 Science 601, issue 6620.

[156] See the 2013 Report, Chapter 5 (competition for acreage and permits), Chapter 7 (enhanced oil recovery), and Chapter 8 (pipeline access and governance).

[157] *Fleetwing Farms Ltd v Marlborough District Council* [1997] 3 NZLR 257 (CA); D Kirkpatrick and B Carruthers, "Land use, subdivision, designations, resource consent procedures and appeals" in D Nolan (ed) *Environmental and Resource Management Law* (LexisNexis NZ, 2015) para 4.45.

[158] 2013 Report p 109.

and duties. It would confer exclusive rights that would resolve a number of competition problems. It would therefore be comparable to the RMA or the Crown Minerals Act. Having a CCS permit would allow its holder to approach stakeholders and other regulators with some evidence that its project had had been authorized in New Zealand's environmental, resources and climate regime.

However, to set up a permit system of this kind would require legislation of some substance, in the form of a new Act or a major amendment of an existing Act. The starting-point of this report is that customized CCS legislation on this scale is not immediately foreseeable, and that in the medium term the focus should be on the legal viability of CCS without legislation, or with only small amendments. The question then is whether New Zealand can foster CCS activity without a CCS permitting system?

Can CCS proponents get the rights they need through other means than special CCS permits? It seems that the answer is yes, under the RMA and EEZ Act. Technically, there is no barrier to the approval of CCS injection under those Acts, with the granting of the necessary resource consents or marine consents.[159] The matters that the Acts require or suggest to be taken into account give CCS a broadly neutral policy setting.

Can CCS be properly regulated through existing legislation, without a custom regulatory framework? The answer seems to be that regulatory arrangements can be made that are likely to protect many aspects of the public interest in a CCS project. The RMA, the EEZ Act, and the CCRA have mechanisms that can address CCS issues. Where they are less effective is in managing complex long-term projects, and the post-injection phase of CCS projects.

Can adequate levels of investment certainty be obtained without a well-defined CCS permit? A permit issued under a highly-developed CCS regime can ratify and confirm the regulatory approval of a project, exclusive rights in preference to other operators, and an assured right to proceed to the project's next stage. Whether such advantages are essential is a corporate judgement, weighing up the risks of working under an imperfect legislative scheme against the environmental and financial benefits of getting CCS up and running. Companies are accustomed to making decisions under legal and regulatory frameworks that are not an exact fit for their projects.

X. Options in Policy Change and Law Reform

A. Law Reform Generally

At this point it is possible to identify the different options to reform the law and bring about policy changes. As it noted at the outset, this report has proceeded on the basis that the most ambitious law reform, a new CCS statute for New Zealand, is outside current expectations.

One of the least ambitious options is a simple section to be added to some Act conferring on the government the power to make regulations for CCS, notwithstanding any provision in that or any other Act. Such a provision could be added to the RMA and the EEZ Act; or to the Crown Minerals Act; but in each case it would have to operate notwithstanding the purpose

[159] Excepting the injection of "third-party" CO_2 in the coastal marine area.

and principles stated by its parent Act, so that it would almost be a separate Act in its own right. While simplicity is a virtue, such a provision would have uncertain effects on the rights of other persons, including property rights, and it would have uncertain relationships with existing laws.[160] So a simple power to make regulations is not a viable option.

Legal commitments by agreement are another option that can be noted, although they are very limited in their potential. An example is if a CCS company entered into an agreement (preferably a deed) with the Crown to commit itself to post-closure obligations; or the Crown could agree to indemnify a company for specified liabilities; or the Crown could contract a company to carry out certain operations. Such agreements cannot contradict statute or regulation, but they can impose additional obligations. They are used only rarely and could be useful for CCS only in exceptional cases.

B. The Range of Possible Policy Changes and Law Reforms

1. No Reform

Before moving to consider policy changes and law reforms, we can consider what actions a CCS developer can take without having to wait. Especially for reinjection projects, there is a good deal of opportunity to engage with regional councils or the EPA and apply for resource consents.

- A company can proceed with certain CCS projects under the existing law and policy. It will need to apply to the regional council for a discharge permit under the RMA or to the EPA under the EEZ Act. The policy environment for the application is neutral, but onshore and in the coastal marine area it does allow the environmental benefits of CCS to be tabled.
- However third-party CO_2 injection in the coastal marine area is a prohibited activity and cannot be granted a discharge permit; and it is possible that reinjection in the coastal marine area is similarly classified.
- A gas producer carrying out reinjection of CO_2 "behind the meter" does not have to account for the gas in the NZETS.
- Reinjection that is an incidental part of oil and gas extraction (petroleum mining) may need approval by NZPAM but does not need permission to inject under private land. Other CCS injection however may require the consent of landowners.
- A company carrying out a CCS project can evaluate its exposure to long-term liability beyond ordinary construction and energy project liability, and determine the commercial acceptability of any risks of liability.

2. Priority Changes

What follows is a listing of changes and reforms that seem to be priorities, based on their importance to CCS and their feasibility. What is important and what is feasible both involve

[160] RI Carter, *Burrows and Carter Statute Law in New Zealand*, 5th ed (LexisNexis 2015) p 135 discuss the tension in statute drafting between detail and broad statements of principle. Greg Severinsen, "Constructing a Legal Framework for Carbon Capture and Storage in New Zealand: Approaches to Legislative Design" (2014) 63 Energy Procedia 6629 evaluates the desirability of incorporation into existing legal regimes whenever possible.

judgement, and can vary from time to time; the interest of political and policy actors is changeable. Similarly different projects raise different concerns, for example some are onshore and some are offshore.

Many of these changes will take time to bring about, especially policies and plans made under statutory processes. A new NPS could take a year to produce once the proposal is accepted; a regional policy statement or regional plan can take two or three years. Amending an Act of Parliament depends on government perceptions of legislative priorities. Some of the changes proposed here can proceed with little policy and law reform work (eg the repeal of s 59(5) of the EEZ Act, and the declaration that CCS is a network utility operation), while others (eg new marine pollution regulations) will require analysis and drafting that will take some time.

This report recommends that these changes to the legal and regulatory regime be given priority.

Policy Changes

- A national policy statement for CCS (an NPS-CCS) is made under the RMA, to identify CCS as a matter of national importance, and state objectives and policies for it, such as recognizing its desirability to meet emissions reduction targets. It would direct decision-makers to have regard to adaptive management options.
- Regional policy statements, regional plans and district plans under the RMA; opportunities are taken to advocate for amendments to recognize and provide for the benefits of CCS in GHG emissions reduction.
- Emissions Reduction Plan under the Climate Change Response Act provides for CCS. The next ERP is due by 31 December 2024.
- Gas Transition Plan under the Emissions Reduction Plan provides for CCS. The Plan is due by 31 December 2023.

Regulations and Similar Instruments

- Resource Management (Network Utility Operations) Regulations 2016 is amended under RMA section 360(1)(e) for a CCS project or work to be declared a network utility operation.
- The Resource Management (Marine Pollution) Regulations 1998 and the Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 are amended, to conform to the London Dumping Protocol, and to classify CCS dumping as a discretionary activity.
- The Climate Change Response Act Schedule 4 is amended by an Order in Council removing the existing definition of CCS as an activity, adding a new and more extensive definition, and bringing it into effect so that CCS becomes an activity in respect of which a person can become a voluntary participant in the NZETS and obtain NZUs for CO_2 sequestered.
- Under the Climate Change Response Act, regulations are made to provide for CCS including long-term sequestration, information requirements, calculation of removals, obligations to surrender NZUs in the event of a leak from sequestration, all to be consistent with the *IPCC 2006 Guidelines*.

Amendments of Acts

- In the RMA and the EEZ Act, the definition of "dumping" is amended by adding CCS to it, in the terms provided for by the 2006 Amendment of the London Dumping Protocol, making it clear that this addition is not subject to any restrictions that may be found in other parts of the definition, and making it clear that it applies to CO_2 from any source.
- EEZ Act: section 59(5), which prevents the positive effects of CCS in reducing GHG emissions from being taken into account, is repealed. The continued presence of this provision in the EEZ Act is clearly an anomaly now that its equivalent in the RMA has been removed, so there is a convincing case for the amendment.
- Natural and Built Environment Bill and Spatial Planning Bill: the progress of these replacements of the RMA through Parliament is monitored to ensure that they do not prejudice CCS, and to take opportunities to improve the new regime.

3. Changes with Less Priority

Policy Changes

- The New Zealand Coastal Policy Statement under the RMA provides for CCS in the coastal marine area and coastal environment. The NZCPS is revised from time to time in a process led by the Department of Conservation, but there is no time limit in the RMA by which a revision must take place. There has been no practice of making *ad hoc* amendments to the NZCPS, so this will be difficult before a general revision occurs.
- An EEZ Policy Statement is made under the EEZ Act. No such Statement has been made yet, but the possibility of making one should be explored. Proposing one solely for CCS, is possible, but it is likely to open up arguments for a wide-ranging policy exercise.

Regulations and Similar Instruments

- A National Environmental Standard under the RMA is explored, to accompany an NPS-CCS. Closer investigation of an NPS would show whether rules in an NES are required.

Amendments of Acts

- RMA and EEZ Act: in order to improve the post-closure regulatory regime, in each Act is inserted a power to make regulations, notwithstanding other provisions of the Act, for the post-injection period, authorizing a resource consent to be issued for longer than 35 years, for it to be compulsory for the company to hold it even after injection has ended, and with a range of financial assurance options.
- EEZ Act is amended to allow adaptive management options to be considered to the extent consistent with the London Dumping Protocol, by amending sections 61(3), 61(4), 63, and 64.
- Crown Minerals Act is amended to authorize the Minister to take into account the desirability of CCS associated with Crown Minerals Act operations, notwithstanding the purpose or any other provision of the Act.

C. Conclusions

The list of changes and reforms to provide a suitable regulatory regime for CCS is a long one. This should not be disconcerting. It is commonplace to be making existing laws and policies

work for new technologies, new business ideas, and new preferences. Similarly, new problems or problems that are newly perceived as serious pose questions about the suitability of existing law and policy, and about the desirability of adjustments or wholesale reform. The implementation of CCS is a case in point; some existing law and policy is very suitable, some can be made to work, and some needs to change substantially.

CCS is affected by special characteristics. It involves long-term sequestration that is relatively novel, but it also involves carbon dioxide which technically is regarded as a contaminant, a pollutant. That makes sense in terms of legal definitions, but a CCS operation is actually a reduction of human interference in the cycling of the most important substance in the biosphere. The result is a regulatory challenge.

The shape of the CCS sector that may evolve in New Zealand cannot yet be foreseen with any clarity; a variety of different sources of CO_2 and technologies may become relevant. At this stage the priority is to make it possible for pioneer projects to get under way in order to begin producing emissions reductions without delay.