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Submission on Proposals for a Regulatory Regime for Carbon Capture, Utilisation and Storage

SUBMITTER DETAILS

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Introduction

I make this submission on the consultation document of June 2024.

I am a Professor of Law in Te Piringa Faculty of Law, of the University of Waikato, and I specialize in energy, natural resources and climate law. I make this submission on my own behalf and not on behalf of the University or any other entity I am involved with.

I have been carrying out research on CCS and CCUS since 2009.

- With Kimberley Jordan and Greg Severinsen, I wrote the leading report to MBIE: *Carbon Capture and Storage: Designing the Legal and Regulatory Framework for New Zealand* (2013).
- I carried out an analysis for the Gas Industry Company as part of its work under the Emissions Reduction Plan: *Carbon Capture and Storage: Taking Action under the Present Law* (2023).

Some of the legal and policy issues changed between 2013 and 2023, as I document in the latter report. But by and large the research and analysis in both reports continues to be relevant to current policy making. Where my answers to your questions, especially the more free-ranging ones, are brief, I commend the two reports to you.

Background

1. *Do you agree that the government should establish an enabling regime for CCUS? Please provide any further information to support your answer.*

   Yes. We need every reduction and mitigation of GHG emissions that we can get, because we have squandered many of the easy options in the last thirty years. An enabling regime is necessary in order to make carbon capture and storage (CCS)

possible. It is less essential for utilisation except where utilisation includes some element of long-term sequestration. It must encompass and enable all forms of carbon dioxide removal (CDR).

2. *Do you agree with our objectives for the enabling regime for CCUS? Please provide any further information to support your answer.*

I agree with Objective 1, emissions abatement, and Objective 2, environmental integrity.

Objective 3, energy security, should be removed, because the purpose of a CCUS regime should simply be to reduce emissions. The only connection there could be between energy security and CCUS is in supply of fossil fuels, natural gas in particular. Natural gas use can continue under the NZETS without CCUS, so energy security is not imperilled without CCUS. Equally, natural gas use may decline without imperilling energy security, as renewables, electrification, energy storage, and demand flexibility increase. It is better to identify CCUS objectives that are clearly focused on reductions, and avoid the criticism that CCUS is merely a tool of the fossil fuel industry.

Treatment under the Emissions Trading Scheme

3. *Should the ETS be modified to account for the emissions reductions achieved using CCS? If so, how do you think it should be modified?*

Yes, the NZ ETS will need modification, but only in detail. Removals of GHGs, such as by CCUS, are inherent in the overall concept and structure of the ETS. Regulations will be required for CCUS's particular monitoring, measurement and verification (MMV) requirements.

4. *Do you agree that all CCS activities should be eligible to receive recognition for the emissions captured and stored? If not, why not?*

Yes. An enabling regime for CCUS must encompass all forms of carbon dioxide removal (CDR), not only forms that relate to fossil fuel combustion. Many new CDR technologies and practices are emerging, and they should all be enabled by new law and policy. Geothermal reinjection is already in operation in New Zealand. Other technologies such as bioenergy with carbon capture and storage (BECCS) seem very suitable for New Zealand, but they need an effective legal and policy regime.

5. *Do you think there should be a separate non-ETS mechanism for providing economic incentives for CCS? If so, what would this mechanism be?*

No. Why would such a complication be desirable for a small nation where CCS has not yet emerged? If the price of NZUs under the NZETS is not high enough to provide economic incentives for CCS then there are two possibilities:

- The price of NZUs in the NZETS may be too low to impel serious corporate action.

- The NZETS is working as it should as a market and is showing that there are cheaper mitigation options than CCS.

Nonetheless, a simple financial incentive program could be devised for CCS without the addition of another complex mechanism.

Monitoring Regime for CCS Activities

6. In your opinion, which overseas standards for monitoring, verification and reporting of CCUS-related information should New Zealand adopt?

It is clear that CCS measurement, monitoring, and verification (MMV) must comply with the IPCC 2006 Guidelines for National Greenhouse Gas Inventories. However an in-depth comparative analysis is beyond the scope of this submission.

7. Is there any other information that CCS project operators should be required to verify and report? Please reference the relevant overseas standards where applicable.

This requires an in-depth comparative analysis that is beyond the scope of this submission.

8. What methods should be used to quantify CO_2 removal and storage in CCUS projects?

I make no comment on this matter beyond referring to the IPCC 2006 Guidelines.

9. Are additional mechanisms required to ensure compliance with monitoring requirements?

I make no comment on this matter.

10. What level of transparency and information sharing is required?

There are strong public policy reasons for requiring a high level of transparency and information sharing. An operator seeks NZUs, or wishes to avoid surrendering them, on the basis of its CCS operation, and (depending on the liability regime) it wishes that its residual liabilities be transferred to the taxpayer. Geological CCS entails the injection of fluid into formations that underlie both public and private property. The *quid pro quo* is a high level of disclosure, at the time of project application and then on a continuing basis.

11. Do you consider there should a minimum threshold for monitoring requirements so that small-scale pilot CCS operators would not have to comply with them? If so, what should be the threshold?

No. Even small-scale pilot CCS operations will be substantial in terms of overall New Zealand emissions. The monitoring requirements for any kind or size of project should be credible without undue complexity.

12. Should a monitoring regime extend to CCU activity?

Yes, if the CCU is claiming some degree of permanent sequestration in order to obtain NZUs in the NZETS.

Liability for CO_2 Storage Sites

13. Do you agree the proposed approach on liability for CO_2 storage sites aligns with other comparable countries (like Australia)? If not, why not and how should it be changed?

Any discussion of liability needs to identify whose liability, to whom, for what act or omission, and under what law; and it is unproductive to discuss the subject until then. I refer you to page 58 of my 2023 Report, for distinguishing between civil liability in contract or tort, administrative liability (for example under the RMA or workplace safety legislation), and greenhouse gas liability.

Most large engineering projects entail many possibilities for liability. CCS operators should expect to address them the same as any other company does, using best practice for safety, environmental compliance, etc, and obtaining insurance cover as necessary. There should be no relief from such liabilities, and instead I recommend that policymakers identify specific liabilities that are peculiar to CCS, and concentrate on them.

Where CCS sequestration fails and can be rectified, for example by reconstructing a well that has failed to contain fluids, then clearly the operator must be liable. There must be full transparency in construction (see above), the regulator must have power to direct the manner of rectification (for example requiring an engineering solution rather than permitting cash to be paid), and the government must have financial assurance that the company can carry the necessary works out.

As experience with CCS grows internationally, the possibility of a catastrophic failure of sequestration seems to be less and less of an issue. The evidence shows that subsurface fluid movement stabilizes soon after the end of an injection phase.

I submit that greenhouse gas liability can be dealt with satisfactorily under the Climate Change Response Act, and regulations made under it, to establish the NZ ETS. Amendments to the Act, and new regulations, will probably be required to make the rules for an operator's obligations to surrender NZUs (or store additional CO_2 without earning NZUs) in suitable time periods to redress a leakage from storage.

There is evidence that CO_2 leakage from well-designed storage facilities may be very slow – virtually non-existent. The IPCC, in observing naturally occurring and existing CO_2 stores as well as models, was able to conclude that "the fraction [of CO_2] retained in appropriately selected and managed geological reservoirs is very likely to exceed 99% over 100 years and is likely to exceed 99% over 1,000 years." Intergovernmental Panel on Climate Change, *IPCC Special Report on Carbon Dioxide Capture and Storage, Contribution of Working Group III of the Intergovernmental Panel on Climate Change*, B Metz et al eds, (New York: Cambridge University Press 2005),

Summary for Policymakers, p 14. Similarly, 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: 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.

14. *Is the proposed allocation of liability consistent with risks and potential benefits? Are there other participants that should share liability for CCS operations?*

What is important is that the taxpayer be fully protected, and that the 'polluter pays' principle is applied to the greatest extent possible. Allocation of liability among successive parties is addressed at question 20, below.

15. *Should liability be the same for all storage sites if projects are approved? Or should liability differ, depending on the geological features and characteristics of an individual storage formation?*

Yes, it should be the same. Differences in geology and storage formations will affect the quantum payable if some occurrence results in liability.

16. *Do you consider there should a minimum threshold for CCUS operators being held responsible for liability for CO_2 storage sites so that small-scale pilot CCS operators would be exempt? If so, what should be the threshold?*

No, there should be no threshold below which operators are excused from any kind of liability. The size of the operation will affect the quantum payable if some occurrence results in liability. Even 'small-scale' operations will be substantial engineering projects.

17. *Should the government indemnify the operator of a storage site once it has closed? If so, what should be the minimum time before the government chooses to indemnify the operator against liabilities for the CO_2 storage sites?*

It is not self-evidently necessary for the government to excuse an operator or assume liability from CCS operations at some point. It has certainly been a common feature of CCS legislation, but as time goes on it has appeared to be less and less of a concern. For example the CCS framework that British Columbia is developing entails no transfer of liability to the Crown.

What is important is that the taxpayer be fully protected, and that the 'polluter pays' principle is applied to the greatest extent possible – as noted above. For all but the most minor residual possibilities, it is the operator who must carry the liability for leakage and other adverse occurrences. The operator should expect to carry liability for an extended period of time.

More important that choosing any particular time period is ensuring that: the project is designed and operated carefully so as to produce permanent stability; that monitoring, measurement and verification of performance be of the highest quality; and that a high standard of proof be required before any indemnity or transfer of liability takes place.

There should be no acceptance of 'good enough' information to allow a transfer of liability to the taxpayer.

18. *Are additional insurance mechanisms or financial instruments required to cover potential liabilities from CO_2 leakage in CCS projects?*

It is likely that insurance and financial instruments to address CO_2 leakages will come progressively more available. A future market for NZUs is already developing.

19. *What measures should be implemented to monitor CCS projects for potential leakage and ensure early detection?*

Monitoring, measurement and verification (MMV) are a central part of the design of a CCS regulatory system. The design should draw on the considerable experience available in other regulatory areas, environmental protection in particular. High quality regulation has features such as: MMV obligations to be world-class best practice, and not to be diluted to reduce expense; full sharing of information at all levels of detail with the regulator; regulator has power to vary MMV requirements as circumstances change; regulator has substantial compliance and enforcement powers (including prosecution and closing the operation down) to ensure that MMV takes place; and public reporting to ensure transparency.

20. *Do you agree that trailing liability provisions are needed? How do you think they should be managed?*

'Trailing liability' is normal and should not be restricted. The general principle is that any company that is, or has been in the past, an owner or operator of the facility should be exposed to liabilities, subject to provisions that excuse them in certain circumstances. There are good precedents for such provisions in environmental law and oil and gas wellsite rehabilitation provisions. They match commercial arrangements such as leases where all former lessees are liable for rent arrears. It is standard commercial practice for the various parties make liability and indemnity arrangements amongst themselves when selling an asset or making a corporate rearrangement. The government should not be left carrying the can.

Consenting and Permitting for CCUS

21. *Are inconsistencies in existing legislation for consenting and permitting impacting investment?*

It is likely that companies are being advised that at present there are real legal barriers to making CCS investment. The legal barriers go beyond mere inconsistency and the consultation document is inaccurate in this respect. It is also inaccurate where it says that the current regulatory settings are broadly neutral, neither enabling nor disabling CCS. While certain niche versions of CCS are possible under the existing law (geothermal, and enhanced oil recovery) for the most part CCS requires changes in the law.

22. *Should the permit regime for CCUS operations be set out in bespoke legislation or be part of an existing regulatory regime (such as the RMA, EEZ Act, the CMA or the Climate Change Response Act 2002)? Please give reasons for your answer.*

My reports of 2013 and 2023, noted above, go into this question in detail. The former came to clear conclusion that a new Act was the best path forward, to ensure that the special characteristics of CCS were managed and accommodated properly. The latter showed that at least in theory some CCS projects could get consent under the existing law, but more significantly it showed that some substantial legal problems would remain. For example, using the RMA and EEZ Act for the post-injection period would not produce the results that public interests require and would at the same time be onerous for companies.

The best path forward for a CCS legal regime is likely to be an extension of the RMA and EEZ Act, with a new Part being inserted into each Act. The 2023 report notes some of the advantages of using these Acts, such as use of the designation procedure. There would be amendments to both Acts; a National Policy Statement and National Environmental Standard (extended to the EEZ in some form); special provisions for permits for different phases, for the long time frames required for CCS projects, and for financial assurance; and overall management by the Environmental Protection Authority. The EPA already manages the EEZ and the NZETS. Geothermal energy projects are already under the RMA. The boundary issues between CCS regulation and general RMA and EEZ regulation would need careful analysis.

To ensure that CCS provisions added to the RMA and EEZ Act work well, attention should be paid to the substantial body of research that has been undertaken on the performance of those Acts, the RMA in particular. For example, there are major shortcomings in compliance, monitoring and enforcement under the RMA that should not be allowed to weaken or complicate CCS regulation.

The Climate Change Response Act 2002 will need minor amendments but most of the work will be in making regulations for CCS removals and emissions. Most of the MMV requirements will be for GHG accounting, under the CCRA – although some of them will be for non-GHG matters such as environmental protection and health and safety. The CCRA is not as suitable as the RMA / EEZ Act for the permitting and management of CCS operations; it contains none of the provisions that they do for such purposes.

The Crown Minerals Act 1991 has a permit system, and it concerns subsurface resources, but its entire focus is on prospecting, exploration and extraction of Crown-owned minerals; it is not about injection. A CCS regime under the Act would have to stand separately from all these provisions, and from the purpose of the Act; it would be a new Act in all but name. There need to be provisions to manage the relationship between CMA and CCS use of subsurface structures (see the 2013 Report, chapter 7) but these provisions will be similar whether CCS is regulated by a part of the CMA or by a part of the RMA and EEZ Acts.

Similarly, the New Zealand Petroleum and Minerals unit in MBIE is entirely concerned with prospecting, exploration and mineral extraction. It is not engaged in environmental management or GHG mitigation. Inevitably, it would be more familiar

and accessible to oil and natural gas companies than to companies with novel sequestration technologies outside the hydrocarbon sector.

However the legislation is designed, it must be equally accessible to all carbon removal technologies. Carbon dioxide removal (CDR) is evolving rapidly; it is no longer the concern of coal-fired power stations and natural gas processing operations. Geothermal sequestration is an example that has become viable in New Zealand. Others like bioenergy carbon capture and storage (BECCS) and direct air capture are eminently foreseeable and will rely on this legislation.

23. Should CCS project proponents be required to submit evidence that proposed reinjection sites are geologically suitable for permanent storage, in order for projects to be approved? If so, what evidence should be provided to establish their suitability?

Yes. A high standard of evidence should be required to establish the suitability of a site for CCS reinjection. World-class best practice should be required. The high level of faulting and tectonic activity in most parts of New Zealand should be recognized in adapting overseas standards and procedures.

24. Should there be separate permitting regime for CCU activity if there is no intention to store the CO_2?

No, there is no need for a permitting regime for CCU unless some public policy issue is identified that requires it. Carbon dioxide use is already common in various industries.

Carbon Capture and Utilisation

25. Are there regulatory or policy barriers to investment and adoption of CCU technologies?

No.

26. What potential markets for CO_2 derived products do you see as most critical in New Zealand?

I make no comment on this matter.

27. Are there any specific barriers to transportation of CO_2?

I make no comment on this matter.