GOVERNMENT CONSULTATION FEEDBACK

Regulatory regime to enable CCUS

Client: MBIE	**Title: Government Consultation CCUS Feedback**
Date Raised: August 05, 2024	

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

Yes, the Government should establish an enabling regime for CCUS. Providing a set of clear regulations and pathway will enable operators of all scale to develop a path to commerciality for their CCUS projects.

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

Yes, the objectives are adequate, however, their goals are quite specific to storage and sequestration of carbon dioxide in underground reservoirs. As there are other ways to decarbonise the energy chain (such as methane pyrolysis, biomass gasification, biogas and biomethane CO2 separation) which result in carbon being sequestered as elemental carbon or actual products rather than carbon dioxide (gas or liquid). Objectives of the enabling regime should allow all technology options to be used as part of the CCUS scheme (as opposed to strictly geological storage).

Existing high-CO2 gas fields seem likely candidates for CCS projects. However, aged fields with limited reserves like Kapuni, will have less incentive to retrofit their plant to run with CCS injection capability. The economics of installing a dedicated storage project (with long term project payback, and CO2 storage liability) for a gas field with relatively short run gas reserves may not be viable without a considerably high ETS cost. The operator of Kapuni could look to utilise existing equipment to utilise the CO2 (already completed as part of their Business As Usual) to supply industry and shift the existing ETS liability to the CO2 end user, while drawing down the last of the field's reserves.

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?

The approach to include CCUS activities as part of the ETS is adequate. Allowing energy users to either offset their ETS obligation or in cases of additional carbon sequestration, allow issuance of NZUs. As outlined in the proposal close scrutiny will be necessary to ensure "no double counting" takes place.

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. Provided there is a clear path to capturing or avoiding fossil-based carbon dioxide from entering the atmosphere, the option should be included as part of the ETS.

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, the incentives for CCS should be included as part of the ETS. The ETS should be the main tool to incentivise decarbonisation. Creating a separate system for CCS activities would add unnecessary complexity to carbon accounting processes across different industries.

There could be an ETS mechanism, whereby similar to planting new forest and having advance issue of NZUs ahead of forest maturity – for CCUS projects could be granted a similar concept where by a portion of the projects NZUs could be issued in advance of the project (like the first 2-3 years worth of NZUs for a 20 year project), to provide some front end economic certainty to the projects. Should the projects not advance or perform to their initial estimate, the NZUs would have to be surrendered or purchased. A similar scheme is employed in Canada for CCUS projects.

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

NZ should adopt the most robust standard, from mature markets. As industrial users and consumers of energy who export their goods typically have stringent environmental and carbon reporting requirements, the chosen system should align with the requirements where their products are sold to market. Products being sold to the EU typically have more rigorous carbon border adjustments. Consideration should be made for how any CCUS activities will affect the cross-border carbon accounting for consumer products.

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.

As mentioned earlier, the objectives and reporting requirements proposed are not technology agnostic. The considerations seem very specific for underground storage of carbon dioxide. The information and reporting requirements should allow other forms of carbon sequestration.

8. What methods should be used to quantify CO2 removal and storage in CCUS projects?

The method employed by Australia seems prudent. An adaptation where the CCUS project submits a project plan to be included with the NZ ETS seems appropriate. However, given the potential variety of types of CCUS projects, some regulatory guidance should be given from the ETS. Forestry operators have a clear set of regulations to adhere to, to ensure their obligations to the ETS are met. CCUS projects should have some regulatory guidance pertaining to the types of CCUS which are being employed, to ensure their obligations to the ETS are met . Operators having a clear set of NZ specific regulations to work to, will allow projects to progress from conception to economic viability and ultimately execution.

A CCUS project plan should include a defined baseline for CO2 emitted, using reasonable practices for quantification / measurement of baseline emissions. The project plan should outline methods for capturing, transporting and measuring the quantity of CO2 avoided from the atmosphere (compared to baseline).

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

An audit and compliance program that follows a reputable standard should be employed. Compliance checks should ensure NZ's nationally determined contribution (NDC) is acceptable to the Paris Agreement and global commitments / standards.

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

CCUS project plans should be run through NZ MfE or MBIE scrutiny. It is likely project plans will contain commercially and intellectual property sensitivities that should not be shared publicly. However, the baseline emissions a project is aiming to capture, and the methods for sequestration and long term sequestration liability and monitoring should be outlined publicly.

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?

Any CCUS operator that is looking to be part of the ETS should have to adhere to the reporting and monitoring requirements, regardless of scale.

12. Should a monitoring regime extend to CCU activity?

For projects employing utilisation of CO2, it is important the project baseline emissions are quantified similarly to projects employing storage of the CO2.

The monitoring requirements (and standards) for utilisation projects will be determined by end user carbon reporting requirements. Once the CO2 is captured, and transported for utilisation, the carbon liability will shift from the source capturer to the end user. It is important any regulations imposed for NZ CCU projects, should allow flexibility to ensure carbon liabilities are consistent with established (likely overseas) supply chain carbon reporting methods. For instance, certain products utilising the CO2 will have to adhere to guidance from the International Sustainability & Carbon Certification, which has prescriptive guidance for supply chain reporting. While other end users may only have voluntary carbon reporting requirements for their products.

13. Do you agree the proposed approach on liability for CO2 storage sites aligns with other comparable countries (like Australia)? If not, why not and how should it be changed?

Carbon dioxide is a long-lived greenhouse gas and its effects for non-biogenic emissions building up in the atmosphere have resulted in climate change. The concept of using CCS projects to adapt existing energy systems and commercial processes to limit emissions to the atmosphere and slow climate change is great in principle. The pillar of the storage projects which CO2 which has been "captured" and been reimbursed (or credited) as part of the ETS, is that this CO2 should not ever enter the atmosphere.

The proposal to indemnify for an operator for at least 15 years after the closure is a good start. The EU requirement for 20 years plus monitoring for an additional 30, seems like a more appropriate term of responsibilities. Unfortunately the pillar of CCS projects, is that the CO2 remains out of the atmosphere forever, would imply that even after an operator's period of liability of 15 -20 years, the CO2 still needs to remain indefinitely.

The requirement for indefinite storage should not be taken lightly. Should the CO2 leak after the company's lability has ended, the project has paid itself back, and the CO2 could be released to atmosphere – the principle of the project has been lost. A scheme where the operator pays into a fund throughout the life of the project, whereby the fund is used to cover long term monitoring costs on behalf of the state seems prudent (such as in Alberta Canada).

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

The considerations liability and risks are explained in 13. No additional participants should be included aside from the CO2 source capturer, transporter and storage operator (and utiliser should the project be CCUS). Each of these entities have their own responsibilities as part of the supply or storage chain.

After the 20 year (or longer) closure time period, through the appropriate monitoring - the long term effectiveness of storage for each scheme should be well understood. In instances where a storage scheme were to leak, the financial penalty should be considered for the carbon price at the time of the leakage. As carbon prices are likely to rise, the penalty should align with the carbon price at the time.

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?

As outlined in item 13, the certainty for eternal storage is hard to estimate. However, long term effectiveness of certain geological formations or product utilisation / transformations for CO2 sequestration will be easier to quantify with certainty. Liability duration should be consistent for all operators, however, the risk the

storage/sequestration method will or will not meet the storage requirements should be assessed for each scheme.

16. Do you consider there should a minimum threshold for CCUS operators being held responsible for liability for CO2 storage sites so that small-scale pilot CCS operators would be exempt? If so, what should be the threshold?

No there should not be a minimum threshold for liability. Any operator proposing to capture and store CO2, regardless of scale, which is given credit (or subtracted) for CO2 liability as part of the ETS should be held to the same monitoring, liability and responsibilities.

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 CO2 storage sites?

No, the government should not indemnify the operator of a storage site once it has closed. The pillar of CCS projects are that the CO2 remains stored indefinitely. The EU suggestion of 20 years liability, then 30 years support for further monitoring may seem onerous for economic viability of the operator. However, there may be mechanisms such as setting up a fund for ongoing monitoring and decommissioning liability. Certain types of geological or transformation storage may have less risk as their methods may involve transformation from CO2 vapour to other forms which are less likely to leak, however, these advantages / disadvantages will have to be accepted as part of the economic viability of each scheme.

18. Are additional insurance mechanisms or financial instruments required to cover potential liabilities from CO2 leakage in CCS projects?

Yes, some form of insurance to prevent future leakages is required. As mentioned previously, the concept of a "Post-Closure Stewardship Fund" as adopted by Alberta, Canada could be a good framework for ongoing coverage of each scheme.

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

Monitoring methods are likely to be specific to each scheme's storage method. Measurement and leakage detection systems (however they may look) should be able to quantify any leakage such that corrective measures can be put in place in a timely manner to prevent further leakage and mitigate damages. The system to measure and report leakages will be a valuable tool to ensure corrections are implemented quickly and any costs are addressed to the liable party in the appropriate time frame.

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

Yes, trailing liability should be considered. There could be an opportunity to associate the ETS carbon liabilities for the quantity of CO2 stored under the operation of each owner. Such that the first owner of the storage facility is not penalised for CO2 stored after their operation tenure.

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

Yes, the inconsistencies are impacting investment. Another factor which results from the inconsistencies is the uncertainty for projects being approved which comes with it. The type of projects which involve infrastructure (such as processing plants, transport pipelines, well heads, etc) to be constructed by private parties other than the crown, have significant uncertainty relating to land access and ownership. For instance, a private entity

constructing a new pipeline to transport carbon dioxide cross country to a reservoir may not qualify as a nationally significant project, and negotiations for land use for the installation of such a pipeline will rely on good faith negotiation and agreement from each landowner. Pipeline projects historically were constructed through the Ministry of Works, as a crown entity. Private infrastructure projects (like CCUS) do not have the certainty for land access and ownership compared to the likes of NZTA for road projects or water and wastewater infrastructure (all of which provide a clear public benefit).

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.

As the EEZ, RMA have considerations for extractive type activities, the long-term storage goal of CCS projects (which are putting things back in the groun) will require additional guidance. There will need to be some bespoke legislation for the specifics of CCS projects. The CCS legislation would look to identify the gaps in the existing legislation, and act as an Appendices or additional document which still references most of the existing legislative acts.

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, the project proponents must submit evidence the proposed sites are geologically suitable for permanent storage. Likewise, the project proponents must also submit evidence the CO2 they have captured can be transformed into another form that can be used (or essentially stored) permanently.
The evidence will be dependent on the scheme, however, in the case of geological storage a reservoir assessment or geological formation assessment should make the basis of evidence. Additional above ground facilities plans and long term equipment maintenance / monitoring plans for long term storage should be included as evidence prior to the scheme being qualified.

24. Should there be separate permitting regime for CCU activity if there is no intention to store the CO2?

No, the framework for CCU projects should follow existing permitting regimes, or any amendments for CCS projects that reference to the existing legislation. Although, there will be specifics to carbon capture and utilisation which will not be easily defined by current existing acts, it is recommended any amendments to facilitate CCS projects also consider the gaps in existing legislation, necessary for CCU projects.

The key difference for CCU projects is that the supply chain reporting requirements are specific to the end use product utilising the CO2. To ensure flexibility for carbon reporting the legislation could look to mirror a recognised international permitting regime.

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

Considering projects which leverage non-fossil CO2 utilisation should be considered, as well as those with fossil origin. The opportunity for repurposing CO2 from sources like organic waste, biogas, biomass have the potential to result in significant emissions reductions. There is also additional potential for projects that lock carbon in solid form (like biochar from biomass gasification, carbon black from methane pyrolysis, and carbon dioxide utilisation through organic growth and soil sequestration).

These solutions are reasonably advanced in technology readiness and can provide additional ETS incentives for project economics. However, they are all faced with a similar prospect of inputs which are more costly than traditional fossil based energy sources. Providing clear framework for these “less traditional” CCU projects to

be included in the ETS is paramount. Policy guidance is still required for renewable gas certification. Waste minimisation and organic diversion programmes from landfill to bioenergy projects would be a worthwhile use of government regulatory resources.

26. What potential markets for CO2 derived products do you see as most critical in New Zealand?

In addition to the list included in the consultation, another important use for CO2 from CCU projects is for production of synthetic fuels, such as methanol, and aviation fuels.

There are portions of biogas / biomethane projects, where the process results in a biogenic source of CO2, which can be used for products as usual, but attract value in product supply chains where carbon neutrality adds value.

There are some concerns about a restrained market for CO2 in NZ, being oversupplied from CCU projects. The increased supply would help control the cost of industrial and beverage grade CO2 but also diminish the value that CCU projects' business cases have been built on to make the projects viable. The risk of unpredictable changes in the overall CO2 market is troublesome for project investors to commit to developing these types of projects.

27. Are there any specific barriers to transportation of CO2?

Yes. Transport by pipeline is considered generally the most cost effective way to transport volumes of CO2 relevant to the scale of CCUS projects being considered. Land access and permitting requirements for high pressure CO2 pipelines being developed by private entities does not have a clear pathway for approval.

Perhaps fast track consenting does provide a clear consenting pathway, however, the nature of cross country infrastructure projects which cross multiple land parcels and affect local communities requires greater authority (than good faith negotiation by private companies) to ensure projects have access to land corridors required for the infrastructure.

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