

## Introduction

This consultation response has been prepared on behalf of representatives of Beca's Industrial Business, and our response is limited to areas where we have input on the technical objectives and execution of CCS/CCUS policy measures. Please see below.

## Question Responses

No.	Question	Response?
1	Do you agree that the government should establish an enabling regime for CCUS? Please provide any further information to support your answer.	We support fair and equitable policy measures that will reward CCS based on the carbon reduction outcomes, and support required natural gas usage between now and 2050. We recommend that policy measures clearly differentiate and separately manage CCS and CCU activities, given the difference in long-term carbon emissions impacts between permanent storage and sequestration vs. reuse of above-ground carbon dioxide.
2	Do you agree with our objectives for the enabling regime for CCUS? Please provide any further information to support your answer.	We support the objectives, in covering the challenging interactions between improving energy security, emissions abatement and wider environmental impacts. We would encourage policy-makers to consider two items in formalising these objectives. Firstly, whether CCS should enable an increase in ambition for emissions abatement over time, rather than an additional pathway for emissions abatement only. Secondly, how security of energy supplies is defined, in the context of a national energy strategy – there is certainly a risk that CCS technologies extend the lifetime of fossil fuel extraction in Aotearoa NZ beyond what is strictly necessary for a net-zero transition.
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?	We support the modification of the ETS to account for emissions reductions achieved using CCS, noting that there will be several other key policy modifications requiring careful adjustment to ensure the modifications achieve the required results. Firstly, considering that many operators with the potential for establishing reinjection may be recipients of industrial free allocations, how these policies interact should be considered so as to allow for long term investment planning i.e. not adjusting industrial allocations for a sector based on one CCS project. Secondly, the permitting framework needs to reflect the criticality of long-term storage that underpins any accreditation or reward via the ETS, ensuring that availability of credits as a financial benefit does not drive behaviour with potential to create significant environmental harm.

4	Do you agree that all CCS activities should be eligible to receive recognition for the emissions captured and stored? If not, why not?	All CCS activities that can demonstrate that their removals are a) additional and b) permanent should be eligible to receive NZUs for the carbon removed, if the ETS modifications are actioned. We recommend that outside of credit eligibility, CCS activities should not receive additional recognition for their potential merits in processes such as consenting or permitting processes, for example.
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?	We believe that any additional government support mechanism for permanent CCS removals, above and beyond what would be justified under proposed modifications to the ETS, should be compared and contrasted against benefits from alternative public investing in low-emissions transport, industry, agriculture on a cost/benefit basis. This could consider wider benefits such as social, cultural and health impacts of investment. Additional government investment in mitigation or sequestration should be managed separately from this consultation.
6	In your opinion, which overseas standards for monitoring, verification and reporting of CCUS-related information should New Zealand adopt?	No response to this question.
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.	No response to this question.
8	What methods should be used to quantify CO2 removal and storage in CCUS projects?	No response to this question.
9	Are additional mechanisms required to ensure compliance with monitoring requirements?	No response to this question.
10	What level of transparency and information sharing is required?	No response to this question.
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?	We support the intention of a minimum threshold for monitoring and liability to encourage innovation and pilot-scale development. We would recommend a threshold of 100 tonnes per annum would be a suitable threshold for the purposes of removing monitoring and liability requirements. However, for the purpose of piloting CO2 capture and reinjection we are not confident that full CO2 stripping, transportation and reinjection will be able to be achieved at this scale due to the baseline requirements for pipework and well infrastructure, which is a significant cost barrier to pilot-scale operations.

12	Should a monitoring regime extend to CCU activity?	We believe that CCU should not be managed in a similar fashion to CCS, and that non-permanent and/or non-export CCU should not be eligible for ETS benefits in a similar fashion to current ETS production requirements. By this merit, we would recommend that no additional monitoring is required to manage CCU activities if the sequestration in products is non-permanent in nature.
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?	No response to this question.
14	Is the proposed allocation of liability consistent with risks and potential benefits? Are there other participants that should share liability for CCS operations?	No response to this question.
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?	We believe that liabilities should be based on individual projects and their relevant technical risk profiles, which may include for example geological features and/or characteristics of storage formations as assessed by a suitably-qualified and experienced technical specialist.
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?	We support the intention of a minimum threshold for monitoring and liability to encourage innovation and pilot-scale development. We would recommend a threshold of 100 tonnes per annum would be a suitable threshold for the purposes of removing monitoring and liability requirements.
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 response to this question.
18	Are additional insurance mechanisms or financial instruments required to cover potential liabilities from CO2 leakage in CCS projects?	No response to this question.
19	What measures should be implemented to monitor CCS	No response to this question.

	projects for potential leakage and ensure early detection?	
20	Do you agree that trailing liability provisions are needed? How do you think they should be managed?	No response to this question.
21	Are inconsistencies in existing legislation for consenting and permitting impacting investment?	No response to this question.
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.	No response to this question.
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?	<p>Yes. The counter approach is to assume all sites are geologically suitable. This is not the case. Supporting evidence for explored reservoirs must include multi vintage 3D seismic acquisition and interpretation, PVT analysis and reservoir SCAL analysis. These are requisites, data collected over decades of hydrocarbon production, which must be provided for 3<sup>rd</sup> party review of geologic suitability.</p> <p>In the case of new reservoirs outside of the established Energy and Petroleum sector, a compelling business case to pursue alternative (and in terms relative to E&amp;P characterisation) sequestration candidates outside of the established E&amp;P sector will need to address and prove superior understanding of 1) known gross rock volume (2D/3D seismic), 2) decades of production (PVT) characterisation, 3) actual rock (SCAL) analysis, and 4) <i>possible</i> lower marginal cost to entry.</p>
24	Should there be separate permitting regime for CCU activity if there is no intention to store the CO <sub>2</sub> ?	We believe that CCU should be not be managed in a similar fashion to CCS, and that non-permanent and/or non-export CCU should not be eligible for ETS benefits in a similar fashion to current ETS production requirements. Permitting via existing regulatory processes should be sufficient to manage CCU operations if there is no intention to store the CO <sub>2</sub> .
25	Are there regulatory or policy barriers to investment and adoption of CCU technologies?	We are not aware of any specific regulatory and/or policy barriers to the implementation of CCU technologies in New Zealand. With CO <sub>2</sub> being a high-value product in the food and beverage industry and key input into many chemical processes, with a mature supply market containing a number of domestic CO <sub>2</sub> sources, it is unclear if there are any

		barriers beyond upfront capital costs preventing the development of more CCU operations domestically.
26	What potential markets for CO2 derived products do you see as most critical in New Zealand?	No response to these questions.
27	Are there any specific barriers to transportation of CO2?	<p>A particular addressable challenge that we would like to comment on is the technical safety of CO2 transfer in pipelines. These risks are well understood and can be successfully mitigated by industry, but they need to be approached and managed as a specialist activity requiring appropriate engineering design and ongoing and prudent operational oversight.</p> <p>Typical CO2 transport is undertaken in dense phase at high pressure (much higher pressure than typical natural gas transmission or distribution) which elevates the risk and consequences of pipeline rupture or failure events. If a CO2 pipeline rupture occurs in a low-lying or populated area, beyond the initial hazard from the high-pressure release, the resulting CO2 cloud can also asphyxiate people within a certain radius of the rupture.</p> <p>To manage these risks and prevent these incidents, CO2 pipeline transportation must be done with a robust Safety Management System in place.</p> <p>This barrier also extends to the suitability of existing gas piping infrastructure for the use of CO2 transportation. Carbon steel pipework is not suitable for transportation of CO2 without strict requirements on dehydration of injected CO2 due to corrosion risks. This risk extends particularly for managing pipelines and injection infrastructure in turnaround or shutdown events, where there is an elevated risk of water ingress into pipelines. Pipeline standards need to ensure that appropriate materials are used, and turnaround procedures are managed in line with specific risks.</p>