MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

COVERSHEET

Minister	Hon Simon Watts	Portfolio	Energy
Titles of Cabinet Papers	Enabling Carbon Capture, Utilisation and Storage Policy Approach for Carbon Capture, Utilisation and Storage	Date to be published	27 March 2025

List of documents that have been proactively released		
Date	**Title**	**Author**
October 2024	Enabling Carbon Capture, Utilisation and Storage	Office of the Minister for Energy
16 October 2024	Enabling Carbon Capture, Utilisation and Storage ECO-24-MIN-0223 Minute	Cabinet Office
9 October 2024	Regulatory Impact Statement: Enabling Carbon Capture and Storage	MBIE
9 October 2024	Climate Implications of Policy Assessment: Enabling Carbon Capture and Storage	MBIE
December 2024	Policy Approach for Carbon Capture, Utilisation and Storage	Office of the Minister for Energy
11 December 2024	Policy Approach for Carbon Capture, Utilisation and Storage ECO-24-MIN-0305 Minute	Cabinet Office
26 November 2024	Regulatory Impact Statement: Further decisions on an enabling framework for Carbon Capture and Storage	MBIE

Information redacted **YES**

Any information redacted in this document is redacted in accordance with MBIE's policy on Proactive Release and is labelled with the reason for redaction. This may include information that would be redacted if this information was requested under Official Information Act 1982. Where this is the case, the reasons for withholding information are listed below. Where information has been withheld, no public interest has been identified that would outweigh the reasons for withholding it.

Some information has been withheld for the reasons of Confidential advice to Government, Negotiations, and National Economy.

Climate Implications of Policy Assessment: Disclosure Sheet

This disclosure sheet provides the responsible department's best estimate of the greenhouse gas emissions impacts for New Zealand that would arise from the implementation of the policy proposal or option described below. It has been prepared to help inform Cabinet decisions about this policy. It is broken down by periods that align with New Zealand's future emissions budgets.

Section 1: General information

General information	
Name/title of policy proposal or policy option:	Enabling Carbon Capture and Storage
Agency responsible for the Cabinet paper:	Ministry of Business, Innovation and Employment and Ministry for the Environment
Date finalised:	9 October 2024
Short description of the policy proposal:	We seek to create the key elements of an enabling regime for Carbon Capture and Storage (**CCS**) to support New Zealand to achieve its climate change targets and to support security of energy supply.

Section 2: Greenhouse gas emission impacts

The emissions impact of creating a regulatory regime for CCS is uncertain. It depends on the extent businesses choose to invest to deploy this technology. There are a limited number of businesses within New Zealand where it would be technically and commercially viable to use CCS given the current cost of this technology. This means emissions reductions from CCS depend on the decisions from a small number of businesses to either use CCS or not. Further details about the factors that influence the likelihood of businesses deploying CCS are provided in the additional information section below. Given this uncertainty, we have developed scenarios from low to high CCS uptake to show the potential emission reductions from CCS. We consider scenarios A or B more likely based on information we have from engaging with businesses that we identified as potential CCS users.

Scenario A – No CCS deployed by 2035

Under this scenario no business in New Zealand deploys CCS by 2035. Therefore, there is no emissions impact from CCS in Emissions Budget Two or Emissions Budget Three.

Scenario B - CCS deployed in 2027 by one gas producer

Under this scenario, CCS is used by a major gas producer to capture emissions during gas production from 2027 for a high CO_2 gas field. The CO_2 is stored in an existing reservoir owned by the gas producer. The gas producer only stores its own CO_2 and none for other parties. The gas producer uses CCS to produce proven plus probable (**2P**) reserves from this gas field that it would have developed anyway, so there is no additional gas produced from CCS being deployed.

Sector & source	Changes in greenhouse gas emissions in tonnes of carbon dioxide equivalent ($ktCO_2$-e)		
	2026–30	**2031–35**	**Cumulative impact**
Gas production	-1000	-914	-1914
Total	-1000	-914	-1914

Scenario C - CCS deployed in 2027 by two gas producers, with third party gas sequestered and extra gas mined

Under this scenario, CCS is used by two gas producers to capture emissions during gas production from 2027 for high CO_2 gas fields. The CO_2 is stored in existing reservoirs owned by the gas producers. One of the gas producers stores both its own CO_2 and that of third parties. These third parties may include other gas producers or industrial businesses located nearby. In addition, CCS unlocks additional gas production by making it more viable to produce contingent gas resources[1] in one of the gas fields because the gas producer captures CO_2 rather than paying Emissions Trading Scheme (**ETS)** costs to vent it. Note that the use of CCS in this second field does not contribute to overall emission reductions because it is assumed this gas production would not happen without CCS.

Sector & source	Changes in greenhouse gas emissions in tonnes of carbon dioxide equivalent ($ktCO_2$-e)		
	2026–30	**2031–35**	**Cumulative impact**
Gas production from major gas producer capturing and storing CO_2	-1000	-914	-1914
Third parties capturing and storing CO_2 in gas producer's facility (based on maximum capacity of this facility after gas producers own CO_2 has been captured and stored)	Up to -85	Up to -701	Up to -786
Additional gas availability	Unknown - depends on levels of additional gas produced, which is not known		
Total	Less emission reduction than -1085	Less emission reduction than -1615	Less emission reduction than --2700

[1] Contingent reserves are gas reserves that become viable to produce where economic or technological conditions change.

Section 3: Additional information

Additional information

Assumptions behind figures

There are several assumptions beneath the results presented that are important to understand.

The emissions figures in Scenario B are based on information provided during the consultation about the amount of CO_2 that can be captured during gas production in a high CO_2 field and the maximum injection rate at the storage site for CO_2. The submitter provided information about the capacity of two potential capture facilities. We have used figures based on the capacity of the potential capture facility the submitter indicated was more likely to be implemented if CCS proceeds. Based on communications with the gas producer most likely to use CCS, Scenario B assumes a rate of capture and storage of CO_2 five per cent less than the maximum to reflect a number of possibilities, such as CCS being harder to deploy than anticipated. This scenario also assumes that the gas producer starts CCS activity part way through 2027 given the lead time for this project.

The emissions figures in Scenario C are based on the information provided for Scenario B and informed by reports by Wood Beca and EY.

The figures in this CIPA does not include estimated changes in emissions associated with re-injection of CO_2 into geothermal fluid. This is a slightly conservative approach. The CCS regime currently being developed does not affect regulatory settings as they pertain to geothermal operations. The work on CCS has confirmed that no specific liability regime needs to apply to the re-injection of geothermal fluid – this was a gap in policy thinking hitherto. It could therefore be argued that the CCS regime will increase the uptake of geothermal reinjection.

Scenario B assumes that only one gas producer uses CCS. If that gas producer were to be successful in deploying CCS, other companies would be likely to consider deploying the technology. In this context, one could argue to use the scenario B for CCS scenario for Emissions Budget Two, and scenario C scenario for EB3. Depending on gas production, Scenario C may result in higher emissions than Scenario B.

The uncertainties in making projections for CCS

The emissions impact in New Zealand depends on the extent to which:

- emitting businesses choose to invest in deploying CCS technology and are able to successfully use it to capture and store their emissions in approved geological reservoirs either from production of natural gas or from other sources
- use of CCS activities unlocks greater gas production and the flow on greenhouse gas emissions impact of this additional supply of gas (which could increase or decrease emissions in the wider economy depending on the circumstances)
- impacts on the demand and supply for ‘emission units’, known as a New Zealand Units (**NZU**), which may be impacted by how CCS activities are treated under the ETS.

Creating a suitable regulatory regime that recognises and rewards emissions reductions or removals within the ETS would create a financial incentive for businesses to use CCS technology. However, whether deploying CCS is commercially viable for businesses will depend on a variety of factors, including:

- the costs of the technology (capital expenditure of tens of millions of dollars would likely be required for businesses to deploy CCS)

Additional information

- the volume of CO_2 available to be captured (eg the predicted volume of natural gas able to be produced to which CCS could be applied)
- the predicted reward for sequestering CO_2 using CCS (NZU prices)
- availability of infrastructure to transport and store the CO_2, and the degree to which such transportation would be necessary
- the specific obligations, liabilities and detailed design features of the regulatory regime, which will be considered when final policy decisions are sought from Cabinet in December (eg requirements for geological suitability tests; obligations to monitor, report on and verify stored CO_2; to mitigate and manage adverse impacts; and to be financially liable for some length of time if CO_2 were to leak from a storage formation).

These factors, which will play a significant role in determining the economic viability and attractiveness of CCS in New Zealand, are difficult to predict. Also, while some international projections show the costs of capturing CO_2 are declining significantly over time, these projections vary widely by point source and capture technology. In addition, if activities that emit CO_2 continue to decline, there will be less CO_2 to be captured from these activities using CCS (eg declining volumes from natural gas production), and so CCS may become less economic over time. Due to these uncertainties, it is hard to know if creating a regulatory regime will result in decisions by businesses to deploy CCS.

If CCS is used to reduce emissions from natural gas production then it might unlock an additional supply of gas, including potentially making some contingent resources economic to produce. However, we cannot provide a quantitative estimate of what this additional gas supply is likely to be. A major reason is that this additional gas supply depends on CCS being used in the first place to make such gas production more economic. For the reasons we have outlined, we do not know if creating a regulatory regime will result in a decision by businesses to deploy CCS.

Impact of CCS on New Zealand's total emissions over time

The New Zealand Emissions Trading Scheme is the key tool for reducing emissions in the energy sector. While CCS will have little long-term impact, short-term reductions will not be immediately offset due to low price elasticity and NZUs not expiring. This would likely create or add to a stockpile of NZUs, delaying the point at which offsetting occur. As a result, the additional emissions reductions from CCS would likely help meet Emissions Budgets Two and Three.

In the event that the deployment of CCS results in more gas being produced from a field, this would not affect New Zealand's total emissions over time. However, it would likely affect the timing of emissions with flow-on impacts to emissions budgets.

There are two reasons why total emissions are likely to be unchanged. First, extra gas being produced may result in less gas or less coal being imported as an energy source. More importantly, energy-related emissions are covered by the ETS cap, and this cap acts as the binding constraint for emissions from the sectors covered by the ETS. This is known as the waterbed effect. The modelling for the second emissions reduction plan will take this effect into account.

The differences between the interim and final CIPA

This CIPA replaces the interim CIPA that accompanied the Proposals for a Regulatory Regime for Carbon Capture, Utilisation and Storage consultation document released in July 2024. It reflects what we have learnt since then, particularly through the consultation process.

The interim CIPA estimated the emissions impact of a regulatory regime for CCS as 1406 ktCO_2-e between 2026-2030 and 3247 ktCO_2-e between 2031-2035. These estimates were based on a series of assumptions about CCS uptake and timing across the following different emitting industries in New Zealand: geothermal generation,

Additional information
gas production, the petrochemical sector and other industries (steel and cement). One assumption was that creating a regulatory regime would encourage greater uptake of CCS in the geothermal sector, even though its emission reductions are already recognised under the ETS. This would have been from the regulatory regime providing greater certainty about approval processes and liability obligations to support investment decisions. Since drafting the interim CIPA, we have received and analysed submissions on the Proposals for a Regulatory Regime for Carbon Capture, Utilisation and Storage consultation paper. We have also met with a wide range of businesses we identified as potential users of CCS. We have learnt that assumptions made in the interim CIPA about levels and timing of uptake were optimistic and should be revised. We found that: • Post combustion CCS that may be used by petrochemical or large industrial businesses is more complex and less mature, so would likely need a higher ETS price to become economic. • Some businesses have investigated CCS and determined the project economics for CCS is challenging, including due to uncertainty about whether ETS prices will be high enough, and other factors (including uncertainties about the level of gas production and availability of gas supply). • Some businesses are still in the early stages of investigating whether CCS is viable for their business and CCS is one potential option to reduce emissions that they plan to consider. • Some businesses would likely only adopt CCS technology if a third party is storing the captured CO_2 on their behalf. Our revised estimate on the impact of emissions reflects what we have learnt from submission analysis and discussions with relevant companies. This is that only one gas producer is a realistic candidate to use CCS in the short term if a CCS regulatory regime is put in place.

Section 4: Quality assurance

Quality assurance
The Climate Implications of Policy Assessment (**CIPA**) team has been consulted and confirms that the CIPA requirements apply to this proposal as its objective is to reduce emissions. There is a potential impact of approximately 1 MtCO2-e in EB2 and 900 KtCO2-e in EB3 if CCUS is deployed at Kapuni. The CIPA team has reviewed the modelling and associated emissions estimates at a high level and consider them reasonable.