



Submission to MBIE on Carbon Capture Utilisation and Storage policies

From:

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CANA would caution the government against embracing CCUS in Aotearoa. It costs too much, it doesn't work, and it's an excuse for the gas industry to continue, rather than to be phased out to address the climate crisis.

1. CCS is not working

While the government's extensive documents quote the enthusiastic sections of the IEA's CCS reports, it's worth noting that CCUS and CCS projects are not proceeding as the industry - and indeed the IEA - states.

IEA lists the CCUS sector as being "not on track" and states it has "trailed behind expectations", and while the IEA appears optimistic at the number of projects now in the pipeline, it notes "nevertheless, even at such level, CCUS deployment would remain well below what is required in the Net Zero Scenario."¹

Indeed the IEA has consistently downgraded the use of CCS in its 2050 projects in the NZE scenario. In its 2050 projections from its first NZE report in 2021 to its 2023 report the IEA reduced its CCS projections by 38.5% for 2030, 57% for 2040 and 20.5% for 2050.

The MBIE report rather alarmingly portrays EOR as some kind of "use" for CCUS, but the vast majority of EOR (enhanced oil recovery) processes do NOT sequester the CO₂: it simply uses it to get more fossil fuels out of the ground and most of the CO₂ is released into the atmosphere.

Chevron's Gorgon a good example of failure

Despite the billions being poured into CCS projects, they are simply not working as planned, and not producing the results advertised by its proponents. Take the Australian example, where Chevron's Gorgon project, set up to take the CO₂ off gas in its LNG processing plant in Western Australia.

¹ IEA CCS <https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage>

The Gorgon CCS facility has consistently failed to meet Chevron's committed targets. The plant was supposed to start operating during fiscal year 2016/17, but only started in 2019. According to its latest annual report, Chevron managed to inject approximately 1.7 MtCO₂ in the year ending June 2023. This amount is only 34% of the 5 million tonnes it captured.^{2,3} The Gorgon plant has underperformed its target for fiscal year 2016/17 to 2020/21 by close to 50%, according to Chevron's own reporting.⁴

For the fiscal year 2023, Chevron reported emissions of 8.2 MtCO₂e for the Gorgon plant to the Clean Energy Regulator. As a result, the 1.7 MtCO₂ sequestered by the CCS facility represent just under 3% of this year's total climate impact from the project, as found by the Institute for Energy Economics and Financial Analysis.⁵

Paying up for not meeting expectations

Chevron has had to purchase 7.5 million tonnes of offsets to make up for failing to meet its contracted injection numbers over the lifetime of its Gorgon project.⁶ This was part of its contract.

Instead of spending a lot of time working out how many credits our gas industry in Aotearoa would get for capturing CO₂, perhaps the NZ Government should instead be looking at it from the other end of the lens: write a contract for the company to meet its obligations, and if they're not met, the penalties should be to either shut down the project or to buy offset credits to make up for the leakage.

*Given the underperformance of **all CCS projects** to date, this would a wiser approach.*

No CCS project on the planet has delivered the capture promises of its investors.

2. Monitoring of transportation

There isn't a comprehensive monitoring regime for pipelines in the US: the regulation is taking place pipeline by pipeline.

It is estimated that 25% of the cost of CCU is in its transportation, with the costs rising with the purity of the gas being transported. A comprehensive overview of the issues associated with transportation of CO₂ from CCU points to the fact there is no standardised regulatory regime for CO₂ transportation;⁷ instead, specific projects have their own point-to-point regulation.

The more impurities in the gas being transported, the bigger the issues with pipeline corrosion, and potential ruptures. While CO₂ isn't toxic *pe se*, a pipeline rupture could

² Chevron Australia (2023) Gorgon Gas Development and Jansz Feed Gas Pipeline [Environmental Performance Report 2023](#)

³ WA Today (2023) [World's biggest carbon storage project off WA coast burying only a third of what it promised](#)

⁴ Institute for Energy Economics and Financial Analysis (2022) [Gorgon Carbon Capture and Storage: The Sting in the Tail](#)

⁵ Institute for Energy Economics and Financial Analysis (2023) [Australia's CCS expansion poses increased risks](#)

⁶ <https://www.theguardian.com/environment/2023/apr/21/emissions-wa-gas-project-chevron-carbon-capture-system-pilbara-coast>

⁷ Simonsen et al, 2024 <https://www.sciencedirect.com/science/article/pii/S1364032123010079>

harm both people and animals nearby. And the toxicity of the gas release also depends on the impurities still in the gas.

Some of these issues could be solved by ensuring the purity of the CO₂ to be transported, the purer the gas, the higher the cost at the CCUS plant as the onus would be on the operator to purify the CO₂ before it was transported.

3. Monitoring CCS storage - and leakage

Aside from the very obvious issues for long-term carbon storage in Aotearoa where our shaky isles are prone to earthquakes, which would threaten any long-term storage aquifers, there are ongoing issues with monitoring for storage, as pointed out in [this report by IEEFA](#), which looked at the only two long-term storage facilities in Norway.

It points out that the storage facilities are not behaving the way they were thought to, with CO₂ rising to the top aquifer literally years before predicted. Each site has its own specific problems, and the level of monitoring by independent bodies would need to be comprehensive. Does New Zealand have any such expertise? Or would we rely on the industry to do this for us?

Who is liable for leakage of CO₂ sequestered when the original company has long gone? Is it the council? This CO₂ needs to be kept in the ground for millennia, if it is really to be seen as a way of "storing" CO₂. This is impossible to monitor, and a 30-year regime isn't long enough to address the long term issues.

4. CCS/US - a lifecycle approach

The government would be wise to look carefully at the full lifecycle of the CO₂ being used in CCUS. Does it fully capture the CO₂? What are the emissions from its capture process, from transportation, and from its end use? Does this, ultimately, reduce the emissions of CO₂ to the atmosphere? Or does it simply reduce (but not eliminate) the emissions from the gas being produced, giving a veneer of greenwash to the fossil fuel industry?

If we're quoting the IEA, we should also remember that the NZE scenarios envisage no new gas exploration from now, and a phase-out of production. We need gas out of the energy system by 2035 at the latest, if we want to keep warming to 1.5 °C. Does CCS contribute to this goal, or does it prolong the life of our gas industry?

CCUS for ethanol: it won't get us to net zero

A 2023 analysis examined the use of CO₂ derived from ethanol plants and sent through pipelines (as CCUS would) to make an ethanol-gasoline blend for vehicles, comparing with electricity generated by renewables for electric vehicles (BEVs). It concluded that the air pollution levels from producing and burning ethanol in an FFV were similar to - or

greater - than those from burning gasoline, whereas BEVs powered by wind or solar eliminate 100% of tailpipe emissions.⁸

The European Union has recognised that the use of CCUS to produce ethanol fuel blends is not aligned with net zero, and, in 2023, passed legislation that gives a 2041 end date for the practice in the EU.

In February 2023 the EU legislation⁹ set new methodology to calculate greenhouse gas emissions savings from Renewable Fuels from Non Biological Origin (RFNBOs) and recycled carbon fuels.

The methodology takes into account the full lifecycle of the fuels to calculate the emissions and the associated savings. It also establishes that the greenhouse gas emissions savings from the use of recycled carbon fuels "shall be at least 70%", compared to the fuels they are replacing. It sets an end-date of 2041 for the use of CO₂ in carbon fuels.

Other issues: CCS in power plants

Also noting this [analysis](#) released by Climate Analytics at the COP28 climate talks in November, which quantified the risk posed by restricting a fossil fuel phase-out to only "unabated" fossil fuels:

"Reliance on large-scale CCS, combined with an underperformance in CCS technologies, could lead to excess greenhouse gas emissions of 86 billion tonnes between 2020 and 2050. This would push the 1.5°C limit out of reach."

⁸ Jacobson et al 2023 <https://web.stanford.edu/group/efmh/jacobson/Articles/Others/23-E85vBEVs.pdf>

⁹ EUR-Lex <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1185&qid=1704969410796>