



<https://www.captivatetechnology.com/>

2 November 2023

To whom it may concern,

Captive Technology is please to respond to the MBIE gas transition plan issues paper, specifically regarding the discussion on CCUS.

<https://www.mbie.govt.nz/dmsdocument/27255-gas-transition-plan-issues-paper-pdf>

Captive Technology is a New Zealand based carbon capture company. Our company is growing and developing based on the discovery of a new, world class adsorbent for carbon dioxide, developed by a team from Massey University led by Prof Shane Telfer.

Captive Technology is deploying its carbon capture technology pilot solution at Huntly power station today <https://www.stuff.co.nz/business/132616380/carbon-capture-an-option-for-huntly-power-station-owner-genesis>. In 2023 we have also successfully tested the technology at Contact's Wairakei geothermal power station. This follows several years of research, laboratory testing and patent filing.

We are very excited about the impact our technology can make on emission reductions. We believe it is a gamechanger for carbon capture and indeed we have seen early success from similar systems to ours, internationally. Our carbon capture solution offers a more flexible and lower cost solution than existing carbon capture methods. We are busy exploring domestic and international opportunities and trying to build the company and expand our impact.

**Specific answers to the CCUS questions in the paper:**

***On a scale of one to five how important do you think CCUS is for reducing emissions from fossil gas use? Why did you give it this rating?***

5.

The UN Intergovernmental Panel on Climate Change (IPCC) said in its April 2022 report on mitigating climate change: "The deployment of carbon dioxide removals to counterbalance hard-to-abate residual emissions is unavoidable if net zero...emissions are to be achieved." The 2023 IPCC report calls for CCUS deployment to be sped up to help the world limit global warming to 1.5-2 degC.

CCUS has been deployed at scale to reduce fossil fuel carbon dioxide emissions in several locations globally. Notable projects include Boundary Dam in Saskatchewan, Canada, and Petro Nova in Texas. As well there is significant experience with CCUS in reducing emissions from other chemical processes such as hydrogen manufacture. Carbon capture has also been used

in New Zealand for decades to reduce the high percentage of naturally occurring carbon dioxide found in New Zealand gas fields.

If we want to keep using fossil gas and we want to decarbonise while doing so, then CCUS is a solution available today. Other solutions such as biomethane or hydrogen cannot be generated in significant enough quantities or are faced with technical hurdles, to fully replace fossil gas.

Driven by new international government stimulus, CCUS technology is advancing rapidly. As CCUS deployment picks up, costs reduce through learning, experience, and optimisation. Reduced costs are an enabler for further deployment of CCUS technology which will lead to a continual reduction in costs.

### ***What are the most significant barriers to the use of CCUS in New Zealand?***

The most significant barriers to the use of CCUS in New Zealand are the cost and economics of implementing a CCUS project and the size of the CCUS market. Carbon capture is growing as a technology at breakneck speeds in North America and Europe because based on research and bodies such as the IPCC, it is seen by governments and investors as a critical tool in the fight against the climate crisis. Those regions have very significant industrial emissions with less renewable power than New Zealand. Policy in North America and Europe has generated a robust price on carbon so CCUS developers can eliminate their carbon costs or trade carbon with liquidity in the carbon markets. These regions also have significant options for carbon dioxide utilisation or storage and economies of scale for carbon dioxide hubs. Governments have introduced capital and operating cost incentives such as investment and production tax credits as well as grants (<https://carbonherald.com/carbon-capture-in-the-uk-set-for-20-billion-government-boost/>). Combined with contracts for differences, developers and emitters now have a clear line of sight to economic CCUS projects.

In New Zealand, for CCUS to advance we desperately need a carbon removal strategy to allow removals or reductions to be recognised in the NZ ETS. We also need government stimulus to help reduce the initial capital costs of an emerging technology and provide grants to support companies such as ours.

Carbon capture and utilisation is possible and happening in New Zealand today. New markets are developing for carbon dioxide such as in efuels including SAF and we need other supplies of carbon dioxide in New Zealand for food and beverage as well as medical purposes to name just two uses.

Missing in New Zealand is a regulatory framework for carbon dioxide sequestration and a carbon dioxide transport network. In other parts of the world like Alberta, Canada, there is a clear process for carbon capture consents and storage projects to happen that specify liability controls, and measurement, monitoring and verification requirements. Legislation for CCUS in Alberta has been in place for over a decade with over 10 Megatonnes of carbon dioxide permanently stored underground.

### ***In what ways do you think CCUS can be used to reduce emissions from the use of fossil gas?***

CCUS can be used to reduce emissions from the use of fossil gas by capturing the carbon dioxide that is emitted from fossil gas combustion in power generation for example. Carbon

dioxide can be stored permanently underground or stored in chemical reactions with rock or injected into concrete.

***Do you see any risks in the use of CCUS?***

The risks are not technical; they are economic. CCUS projects generally involve significant investment and require policy certainty and stable carbon pricing for developers and emitters to make investments in CCUS. If the economic incentives of either a penalty on pollution or stimulus for CCUS is too low, then it will be difficult for CCUS to advance in New Zealand. At Captivate we believe that fossil gas is a transition fuel in New Zealand and CCUS provides an opportunity now to abate the emissions from fossil gas.

Thank you for the opportunity to provide feedback in this consultation. We would be happy to engage further with MBIE regarding Captivate Technology but also CCUS in general. We have a good understanding of the 'state of play' of CCUS technology and the opportunities domestically and internationally. We are also excited about the opportunity to grow our company in New Zealand and be part of a growing cohort of clean tech companies contributing meaningfully to the economy and making a meaningful impact to solve the global climate crisis.

Your sincerely,



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