

Subject: Feedback on proposed regulatory regime for CCUS

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Emailed to gasfuelpolicy@mbie.govt.nz

My feedback on the proposed regulatory regime is described below. It does not follow the 27 consultation questions which are suggested in the proposal document, as these are mainly focused on business-related and regulatory aspects of the CCUS. While I appreciate there are benefits to setting up a CCUS regime in New Zealand, there are some aspects which are given insufficient attention in the proposal document. My feedback covers three of these aspects:

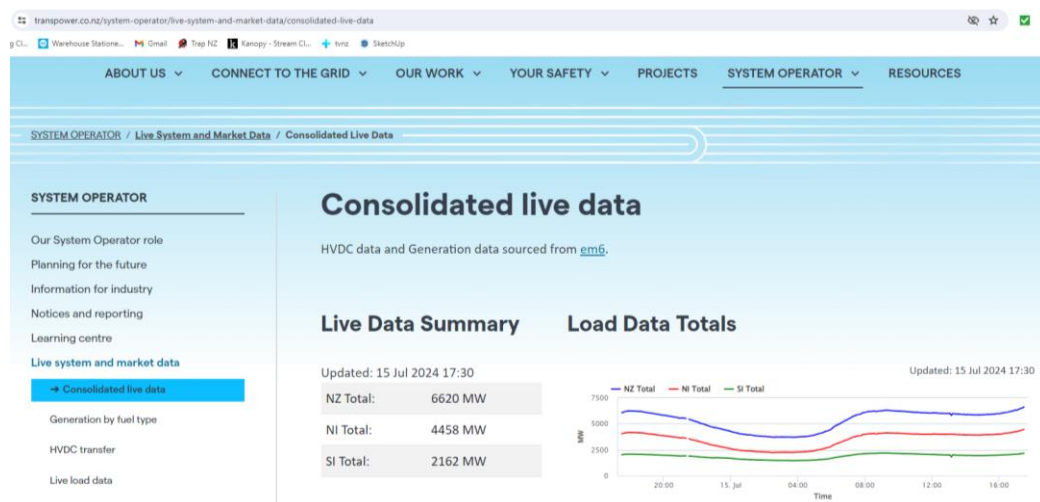
1. Additional energy required for the CO2 capture, transport and injection,
2. Effects of additional energy demand on consumer energy pricing, and
3. Effects of risk transfer from private operator to government.

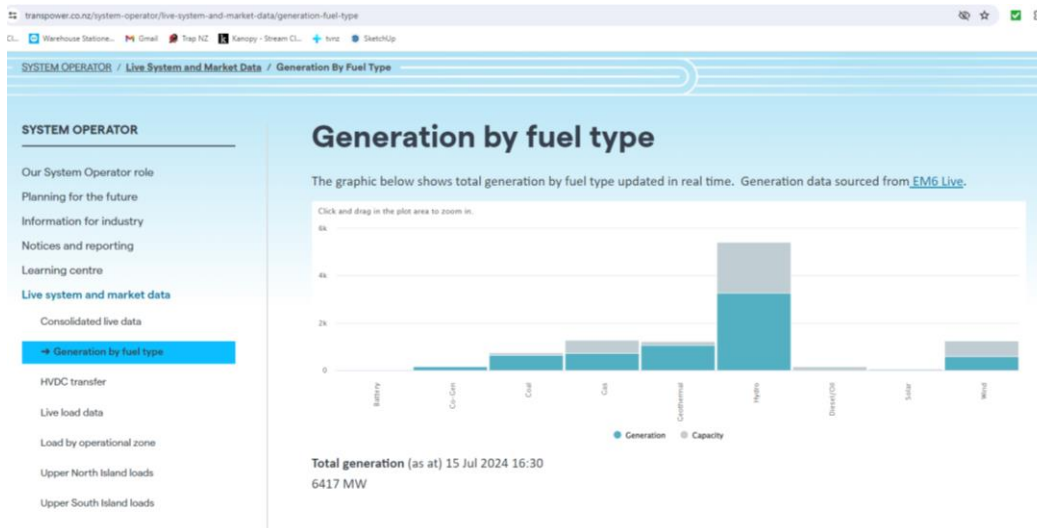
These aspects are covered in the sections below.

1. Additional energy required for the CO2 capture, transport and injection

The proposal document describes the benefits of CCUS but does not highlight the required amount of energy for the actual removal of CO2. This will vary between different applications, but it is expected to be significant. One reliable source mentions between 15 and 25% of energy produced in a power plant would be required to capture the CO2 produced (<https://climate.mit.edu/ask-mit/if-fossil-fuel-power-plant-uses-carbon-capture-and-storage-what-percent-energy-it-makes>).

If the removal of CO2 through CCUS is to have significant impact, then the additional amount of energy required will be very high, in the order of magnitude of 200 – 300MW. This indicative number is based on the 6620MW actual electricity demand, of which 1400MW is generated by fossil fuel sources (based on live data on Transpower website, 15.07.2024 at 17.30h, as copied below). On top of these 200-300MW for electricity production, further capacity would need to be added for CO2 capture at other plants such as chemical processing facilities.





It should be noted that CO₂ capturing from flue gasses is a continuous process, so if a power plant or chemical processing facility is operating 24/24h, the additional power demand for CO₂ capture will also exist 24/24h. Noting that the current power generation capacity in NZ is limited, as demonstrated e.g. during a brief cold spell on 09 May 2024, it is unclear without further explanations how the extra power demand could be continuously satisfied.

Unless the additional power demand can be satisfied by renewable sources (being immediate sources as wind and solar, or delayed sources such as hydro-storage or usage of wood chips as boiler fuel, or future technologies such as large-scale electricity or hydrogen storage), it would appear that the current power-generating infrastructure of NZ is not up for this task. Noting the planning, design, construction and commissioning of a new thermal power plant would take several years, it can only be concluded that the positive effects of CCUS on carbon emissions in the proposal document are highly overrated.

2. Effects of additional energy demand on consumer energy pricing

The proposal document is very much focussed on providing opportunities for businesses to engage with CCUS technology. Whilst this is a valid perspective, in my opinion the possible effects for consumer energy pricing are not sufficiently considered.

The Regulatory Impact Statement does mention consumer pricing on page 39 (“Electricity and natural gas consumers could enjoy more stable electricity and natural gas prices”). Whilst this may be correct for natural gas prices, if as anticipated natural gas could be extracted from NZ sources at higher capacities and/or longer periods, I do not believe this would be realistic for electricity prices.

As described in section 1 of my submission, the application of CCUS will result in a significant increase in power demand, and it is highly unlikely the timeline of construction of new thermal power plants (or hydro-lakes) would be able to keep up with the installation of relatively simple and compact CO₂ capture installations. Therefore, the uptake of CCUS would lead to an increase in power demand whilst little or no extra supply is installed (disregarding discontinuous sources such as solar and wind). This in turn will result in increased pricing pressure in a market where operators of thermal power plants have access at source to cheap power, and many larger industries and clients have huge price discounts compared to

consumer pricing. It is therefore expected that private power consumers, who have less leverage over pricing than corporate clients, will end up payer higher cost for electricity while this imbalance exists between increased power demand for CCUS and stagnant (or slowly increasing) power supply. In a 'cost of living crisis' this is highly undesirable and should be avoided.

I believe the consumer electricity pricing issue should be expressed more clearly in the Regulatory Impact Statement, and I suggest the expected impacts on consumer pricing should be quantified by modelling and included in the proposal.

3. Effects of risk transfer from private operator to government

The proposal document make reference to the Australian approach whereby the government indemnifies the operator against any liability after a set period. Such an approach would understandably be favoured by any business considering an investment as it would limit the risk of CO2 leakage to a set period. Unfortunately, the current proposal would transfer this privately-held risk to the public.

Given the unpredictability of the price of CO2, a major leak of a CO2 storage facility caused by seismic movement, faulty design or other, would result in a high cost to be borne by the government of the day.

In my opinion the preferred option would be for the government to internationally collaborate with other governments to realise an insurance scheme providing long-term cover for private parties needing to offset the future risks of leaking CO2 storage. Each national government could then decide how much risk should be apportioned to the CO2 storage operator and which share the government would take up, balancing the public need for CCUS with the business case for private operators.

Submitted by:

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