



Methane Review Ministerial Advisory Panel

c/- Ministry for the Environment

1 October 2024

Dear panel members,

Thank you for the opportunity to contribute to the body of scientific evidence the Methane Review Ministerial Advisory Panel is required to review. The Parliamentary Commissioner for the Environment (PCE) has been conducting research into biogenic methane and its warming effects since 2018.

The first publication was a note on New Zealand's emissions from livestock based on modelling by Dr Andy Reisinger.¹ The focus of this note was on the contribution to warming from 2016 livestock methane emissions if these followed either a business-as-usual trajectory or a trajectory of no additional warming.

The headline results were that if emissions of livestock methane were held steady at 2016 levels, atmospheric methane concentrations from this source would level off within about ten years, however the warming effect would continue rising to 10–20% above current levels by 2050 and 25–40% by 2100. To achieve no additional warming beyond the 2016 level emissions would need to be reduced by at least 10–22% below 2016 levels by 2050, and 20–27% by 2100.

More recently a comparable piece of research was commissioned by DairyNZ, Beef + Lamb New Zealand and Federated Farmers, which found reductions in agricultural methane in the range of 15–27% by 2050 relative to the 2020 level would be required to achieve no additional warming from livestock methane emissions above the 2020 level in 2050.² This is similar to PCE's finding that reductions of livestock methane emissions of 10–22% below 2016 levels by 2050 would be required to achieve no additional warming above the 2016 level in 2050. The reasons behind the small discrepancies between the two studies have been outlined in PCE's letter to DairyNZ, Beef + Lamb New Zealand and Federated Farmers, which stated:³

"This is not 'new science' and it leaves us exactly as I had previously stated the position to be – namely, that the sustained contribution to atmospheric warming that New Zealand makes through the emission of agricultural methane is a matter of choice, and choosing to maintain this warming at the current level is to claim a 'right' to a certain level of warming from agriculture indefinitely."

It pointed out that focus on the *scientific* debate around no additional warming has distracted us from the relevant *political* debate around the nature of an *acceptable* target for biogenic methane. This debate should consider the availability of techniques and technologies for reducing biogenic methane emissions, and whether a target of no additional warming would represent a fair contribution both domestically and under the Paris Agreement.

Under the Paris Agreement, New Zealand has an international obligation to do as much as it can to keep the 1.5 °C global goal within reach. Thus, if technologies become available that can readily achieve methane reductions greater than no additional warming these should be utilised.

Research in 2019 showed that biogenic methane emissions in New Zealand, the majority of which come from agriculture, contributed around 0.0015 °C of warming to total observed global warming.⁴ To put this into context, New Zealand's *total* gross greenhouse gas emissions were estimated to have contributed a little over 0.0028 °C to observed global warming. In other words, methane was about 55% of New Zealand's warming contribution. This same research found that despite its relatively short lifespan, methane will remain New Zealand's largest single contributor to global warming for the next six decades if gross emissions of biogenic methane, carbon dioxide and nitrous oxide were to continue at observed rates.

The contribution to global warming in general, but specifically from agriculture, is relatively large for a country of our size. Research commissioned by DairyNZ, Beef + Lamb New Zealand and Federated Farmers noted that the reduction of agricultural methane emissions represents the greatest opportunity to reduce New Zealand's contribution to warming.

Any process for setting a target should consider a wider range of factors than the precise boundaries of what science defines as "no additional warming". It should take into account a fair contribution to the 1.5 °C global goal (assuming that is still in fact the Government's goal), New Zealand's domestic ambitions, and the ability of farmers to mitigate biogenic methane emissions.

Another consideration in achieving any ambition for emissions reduction is the availability of offsets. PCE has argued that when considering short-lived climate pollutants, such as biogenic methane, the use of forestry *would* be acceptable for offsetting emissions. Offsetting biogenic methane emissions using forestry makes more sense than using forestry to offset long-lived carbon dioxide emissions. This is because of the broad commensurability between the lifetime of the cooling effect of a pine production forest and the lifetime of the warming effect of the biogenic methane from a herd of ruminants. Thus, in 2022 PCE commissioned a report from Professor Dave Frame and Dr Nathanael Melia which investigated the potential to offset methane emissions using afforestation.⁵ PCE published a report based on this work, and a summary of the key findings.⁶

Headline findings were that a *one-off* planting of around 770,000 hectares of new commercial pine forest by 2050 would have a similar effect on warming as reducing gross methane emissions by 10%. (The area scales in proportion to the percentage of offsetting required). Importantly, any such offsetting would not represent a permanent loss of option value on the land in question since a decision to reduce stock numbers, or the application of some as yet unforeseen technology that reduces ruminant emissions, would allow forest to be removed. This is in sharp contrast to the permanent loss of options for land planted to offset carbon dioxide emissions.

PCE's latest work is on methane emissions at the global level.⁷ This recent study was commissioned from Dr Andy Reisinger and peer reviewed by Professor William Collins. The report breaks down the contribution to global warming from biogenic methane and fossil methane, alongside a more detailed disaggregation of the warming from agriculture, waste, biomass burning, and the additional carbon dioxide that is added to the atmosphere when fossil methane is emitted. PCE also produced a summary of Dr Reisinger's report.⁸

Finally, PCE has published a short piece that summarises our published work into a coherent narrative tying together the main findings.⁹

With kind regards,



Simon Upton

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Te Kaitiaki Taiao a Te Whare Pāremata

¹ PCE, 2018. *A note on New Zealand's methane emissions from livestock.*

<https://pce.parliament.nz/publications/a-note-on-new-zealand-s-methane-emissions-from-livestock>.

² See <https://www.dairynz.co.nz/media/qu1lwtgu/joint-evidence-submission-for-target-review-final-14-sept-2023.pdf>.

³ See <https://pce.parliament.nz/publications/letter-to-dairynz-beef-plus-lamb-nz-and-federated-farmers-about-submission-on-agricultural-emissions>.

⁴ <https://staging.nzagrc.org.nz/assets/Publications/NZAGRC-Report-Scientific-aspects-of-2050-methane-targets.pdf>.

⁵ Frame and Melia, 2022. *Offsetting livestock methane with trees: Balancing warming from ruminant methane emissions with cooling from carbon sequestration by forestry.*

<https://pce.parliament.nz/publications/how-much-forestry-would-be-needed-to-offset-warming-from-agricultural-methane>.

⁶ PCE, 2022. *How much forestry would be needed to offset warming from agricultural methane?; How much forestry would be needed to offset warming from agricultural methane? Summary document.*

<https://pce.parliament.nz/publications/how-much-forestry-would-be-needed-to-offset-warming-from-agricultural-methane>.

⁷ Reisinger, 2024. *The contribution of historical methane emissions to present-day warming.*

<https://pce.parliament.nz/publications/contribution-of-historical-methane-emissions-to-present-day-warming>.

⁸ PCE, 2024a. *The contribution of historical methane emissions to present-day warming: Summary document.*

<https://pce.parliament.nz/publications/contribution-of-historical-methane-emissions-to-present-day-warming>.

⁹ PCE, 2024b. *Offsetting livestock methane emissions using forestry: Summary of main findings.*

<https://pce.parliament.nz/publications/how-much-forestry-would-be-needed-to-offset-warming-from-agricultural-methane>.