



Jim van der Poel

Chair, DairyNZ

Kate Acland

Chair, Beef + Lamb NZ

Wayne Langford

National President, Federated Farmers

11th October 2023

Dear Mr van der Poel, Ms Acland and Mr Langford,

Last month you published a joint submission to the Climate Change Commission on the review of the 2050 target. Attached to the submission was a paper you commissioned from scientists at Oxford University and Cranfield University entitled "Agriculture emissions and warming in Aotearoa New Zealand to 2050: Insights from the science".

The paper you commissioned estimated the reductions in New Zealand's agricultural methane emissions that would be required if New Zealand wished to achieve no additional warming from agricultural methane above the 2020 level (i.e. to maintain the ongoing warming contribution from agricultural methane at its 2020 level). It found that reductions in agricultural methane in the range of 15-27 per cent by 2050 relative to the 2020 level would be required to achieve this objective.

This study appears to be more or less a repeat of the modelling exercise I commissioned and summarised in my 2018 note on New Zealand's methane emissions from livestock.¹

My note was based on modelling by Dr Andy Reisinger, who at that time was the Deputy Director of the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGGRC). His modelling showed that if New Zealand wished to achieve no additional warming above the 2016 level for livestock methane, emissions would need to be reduced by at least 10-22 per cent below 2016 levels by 2050 and 20-27 per cent by 2100, with further reductions after 2100.²

The small difference in the range of reductions required by 2050 can be attributed to methodological differences between the two studies. These differences include:

- **The climate model used:** Reisinger used the Model for the Assessment of Greenhouse-gas Induced Climate Change (MAGICC). Barth et al. used the Finite-Amplitude Impulse Response model (FAIR) model.

¹ Parliamentary Commissioner for the Environment, 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 Reisinger, 2018. The contribution of methane emissions from New Zealand livestock to global warming. <https://pce.parliament.nz/media/ojzboxh/contribution-of-methane-emissions-from-nz-livestock-to-global-warming.pdf>.

- **The base year used for defining no additional warming:** Reisinger used a base year of 2016. Barth et al. used a base year of 2020. Note that a 15-27 per cent reduction in agricultural methane emissions by 2050 relative to the 2020 level is equivalent to a 14-26 per cent reduction from the 2016 level.³
- **The future background concentrations assumed:** Reisinger used an ambitious mitigation scenario (RCP2.6) and a moderate ambition scenario (RCP4.5).⁴ Barth et al. used a highly ambitious mitigation scenario (SSP-119) and a moderate ambition scenario (SSP-245).⁵
- **The scope of agricultural methane emissions included:** In addition to methane from enteric fermentation and manure management, Barth et al. included methane from field burning of agricultural residues. Reisinger's analysis did not.

The Barth et al. paper also calculates the changes in the warming contributions of New Zealand's carbon dioxide, nitrous oxide and agricultural methane emissions if the current emissions reduction targets in the Climate Change Response Act were to be met. Again, this is essentially a repeat of the analysis of the warming implications of New Zealand's 2050 emissions targets published five years ago by Andy Reisinger and Sinead Leahy.⁶

Your submission stated that the work you commissioned "demonstrates a significant development in the scientific understanding of what is required for New Zealand to achieve no further warming from biogenic methane since the commencement of Section 5T of the Climate Change Response Act in 2019".

After reading the study you commissioned, I can find no support for this conclusion. Barth et al.'s work represents no significant development at all in the science since I published my own findings on this topic in 2018. This is a pity - by repeating work that has already been done, an opportunity to move the debate forward has been missed.

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.

As your submission notes, New Zealand should of course be trying to achieve agricultural output with the lowest possible emissions. Industries that claim leadership on this issue, as New Zealand's agriculture sector does, have to show that the target they support is consistent with that.

³ Based on emissions time series data from New Zealand's national greenhouse gas inventory for 1990-2021, published in 2023.

⁴ The Representative Concentration Pathways (RCPs) describe different future scenarios for global greenhouse gas concentrations and radiative forcings. RCP2.6 is compatible with <2°C of warming above pre-industrial levels. RCP4.5 is compatible with <3°C of warming.

⁵ SSP-119 corresponds to RCP1.9 and is compatible with 1.5°C of warming above pre-industrial levels. SSP-245 corresponds to RCP4.5 and is compatible with <3°C of warming.

⁶ Reisinger and Leahy, 2018. Scientific aspects of New Zealand's 2050 emission targets. <https://www.nzagrc.org.nz/assets/Publications/NZAGRC-Report-Scientific-aspects-of-2050-methane-targets.pdf>.

I note the Barth et al. paper acknowledges that “the reduction of agricultural methane represents the greatest opportunity to reduce New Zealand’s contribution to warming”. I came to a similar conclusion in the note I published last year on offsetting agricultural methane with forestry.⁷ However, it is a shame that this important policy-relevant finding was buried in an appendix to an appendix in your submission to the Climate Change Commission.

I intend to share this letter with the Climate Change Commission and, as per my usual practice, publish it on my website.

Sincerely

A handwritten signature in black ink, appearing to be 'Simon Upton', with a stylized, cursive style.

Simon Upton

Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Pāremata

⁷ Parliamentary Commissioner for the Environment, 2022. How much forestry would be needed to offset warming from agricultural methane? <https://pce.parliament.nz/publications/how-much-forestry-would-be-needed-to-offset-warming-from-agricultural-methane/>.