



23 November 2018

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Advice on a biological methane target for 2050 under the proposed Climate Change Bill

Purpose:

To provide you with advice on a biogenic methane target ahead of your discussion at ENV on 27 November.

Minister	Action Required:	Minister's Deadline
Minister of Agriculture Minister of Forestry	Note the recommendations contained in the briefing	Before ENV Committee 27 November

Contact for telephone discussion (if required)

	Name	Position	Work	Mobile
Responsible Manager	s 9(2)(a)	Manager, Domestic Climate Change	s 9(2)(a)	s 9(2)(a)
Principal Author	s 9(2)(a)	Senior Analyst, Domestic Climate Change	s 9(2)(a)	s 9(2)(a)

Key Messages

1. You are discussing the proposed Climate Change Bill (the Bill) at ENV on 27th November. A key element considered under the Bill is a review of the 2050 emissions reduction target, which may include a specific target for biogenic methane reduction.
2. You have received advice from the Climate Change Chief Executives Board (MfE briefing 2018-B-05126 refers) which sets out a potential range for the biogenic methane target based on the available evidence. Their advice suggests an emissions reduction of 22-35% below 2016 levels by 2050 would be consistent with the objectives of the Paris Agreement and achievable.
3. MPI recommends that if a target for biogenic emissions is set in the Climate Change Bill, that the target be 25% below 2016 levels by 2050. This target would be consistent with the objectives of the Paris Agreement to limit global warming to below 1.5°C, and would represent a realistic emissions reduction that can be achieved with currently known technologies.
4. We recommend that the target for biogenic methane be periodically reviewed by the Climate Commission to ensure that the target keeps pace with the development of mitigation technologies and their cost, scientific understanding, and progress towards meeting Paris goals.

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Recommendations

5. The Ministry for Primary Industries recommends that you:

- a) **Note** the Intergovernmental Panel on Climate Change found global emissions of agricultural methane would need to reduce by 24-47% below 2010 levels by 2050 to stay below 1.5°C of warming. **Noted**
- b) **Note** the Parliamentary Commissioner for the Environment found that under a strong global action scenario New Zealand's methane emissions must reduce by 22% below 2016 levels by 2050 to avoid further warming. **Noted**
- c) **Note** that MPI analysis of the Biological Emissions Reference Group research suggests that biogenic methane could reduce by between 7% and 52% without requiring significant changes in production and land use, depending on the speed and nature of technology development. **Noted**
- d) **Note** the upper end of this range is highly uncertain and would depend upon a number of technological advances and strong assumptions on uptake rates, and the ability to overcome market and consumer barriers. **Noted**
- e) **Note** that the advice of Climate Change Chief Executives is that emissions reduction of between 22-35% would be consistent with the objectives of the Paris Agreement and achievable. **Noted**
- e) **Note** that based on current evidence, MPI recommends that if a target for biogenic emissions is set in the Climate Change Bill, that the target be 25% below 2016 levels by 2050. **Noted**
- f) **Note** that meeting this target and contributing to wider global methane emissions reductions under the Paris Agreement is highly dependent on continuing public and private sector investment in research to develop technological solutions and support for high levels of uptake. **Noted**

- 9) **Note** MPI recommends that the target for biogenic methane be periodically reviewed by the Climate Commission to ensure that the target keeps pace with the development of mitigation technologies and their cost, scientific understanding, and progress towards meeting Paris goals.

Noted

Penny Nelson
Deputy Director-General
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Hon Damien O'Connor
Minister of Agriculture

/ / 2018

Hon Shane Jones
Minister of Forestry

/ / 2018

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Background

Issue

6. We have previously provided you with advice on the form and level of a potential new 2050 emissions target under the Climate Change Bill (B18-0710 refers).
7. You have received advice from the Climate Change Chief Executives Board (MfE briefing 2018-B-05126) which set out a potential range for the biogenic methane target based on the available evidence. Their advice suggests an emissions reduction of between 22-35% would be consistent with the objectives of the Paris Agreement and achievable.
8. This note sets out MPI's understanding of that evidence and provides our recommendation on the specific level of the target if a target for biogenic methane is set under the Climate Change Bill.

Analysis

9. Our previous advice recommended that the 2050 emissions target is set with consideration for both the level of biogenic methane and other greenhouse gases. We recommended that you support the cross-agency officials' position which would reduce biogenic methane by [x%] below 2016 levels, and achieve net zero emissions for all other gases. We consider that this option would balance the Government's objectives of international leadership for climate change, economic prosperity, and a just and inclusive society.

Consistency with the Paris Agreement

10. Under the Paris Agreement, New Zealand is obliged to submit a sequence of progressively more ambitious economy-wide targets and to contribute to collective efforts to reduce global emissions to net zero in the second half of the century. The collective international obligation on Parties to the Paris Agreement are not intended to apply to individual Parties given the diversity of national circumstances and starting points. The Paris Agreement does not specify that emissions of biogenic methane need to be offset to zero.

Intergovernmental Panel on Climate Change report on 1.5°C

11. The Intergovernmental Panel on Climate Change (IPCC) was invited under the Paris Agreement to provide a special report on the impact of 1.5°C of global warming and the related global emissions pathway required to achieve this objective.
12. The IPCC concluded that there is high confidence that rapid and far-reaching transitions in energy, land, urban and infrastructure, and industrial systems will be required to stay below 1.5°C. It found that scenarios which are consistent with staying below 1.5°C with limited or no overshoot have the following features:

- emissions of CO₂ reduce to net zero around 2050, and then below (negative) thereafter;
 - emissions of agricultural methane reduce by between 24-47% from 2010 levels by 2050, and then stabilise thereafter; and,
 - expressed together using the GWP₁₀₀ equivalence metric, global greenhouse gas emissions are cut by between 81-93% from 2010 levels by 2050.
13. The report finds that deep reductions in methane emissions will be needed to limit warming to 1.5°C; but neither methane nor nitrous oxide are required to reduce to zero. The main sources of methane emissions globally are fossil fuel extraction and transportation, land use change, livestock and rice cultivation and waste sectors.

Report by the Parliamentary Commissioner for the Environment

14. The Parliamentary Commissioner for the Environment (PCE) has recently published research into the warming effects of biogenic methane. This research looks at what reduction would be required for New Zealand's biogenic methane to cause no further warming of the atmosphere.
15. The report considered two scenarios for global action. In a scenario where there was limited global emissions reductions, New Zealand would have to reduce biogenic methane by 10% to avoid further warming. In a scenario where there was strong global action to reduce emissions, broadly consistent with the goals of the Paris Agreement, methane would need to reduce by 22% to avoid contributing to further warming. The additional reduction under strong global action is due to lower levels of methane in the atmosphere in this scenario, which means that the remaining methane that is in the atmosphere traps more heat.
16. Rapid initial biogenic emissions reductions would be required to avoid further warming. The modelling for the PCE finds that the emissions would have to decline by 20% by 2030 under the strong global action scenario to keep New Zealand's biogenic emissions from increasing warming in the short term. More gradual initial emissions reductions would require deeper cuts by 2050 to compensate.

Potential to reduce biogenic methane and implications for primary sectors

17. MPI, as part of the Biological Emissions Reference Group (BERG), has assessed the potential for biogenic methane emissions reductions by 2050. Based on this research we assess that biogenic methane could reduce by between 7% and 52% without requiring significant changes in production and land use, depending on the speed and nature of technology development.

18. The higher end of the range above is more speculative in terms of technological advances, and relies on a number of strong assumptions including optimistic uptake rates, and overcoming a number of market and consumer barriers. Faster rates of technology change are likely to require accelerated investment by both public and private sectors to develop technologies and drive innovation.
19. Further reductions in biogenic methane beyond the range above are possible with a shift in land use away from pastoral agriculture and towards alternative land uses, such as horticulture or forestry. Modelling from both the Productivity Commission and the BERG suggests forestry is most likely to displace some sheep and beef farming on steeper land. A degree of land use change is likely under any 2050 target as afforestation is encouraged by higher emissions prices.

Stakeholder views

20. Submissions to the Zero Carbon Bill consultation from primary sector bodies unanimously supported the target option that recognised the different impact of biogenic methane on the atmosphere compared with other greenhouse gases. However, sector bodies did not put forward specific views on what the level of a biogenic methane target should be.
21. In addition, sector organisations have already set out unilateral commitments for emissions reductions that demonstrate their ambition to reduce emissions, including biogenic methane:
 - Beef+Lamb: every farm achieves net zero emissions by 2050, including on-farm offsets from tree planting;
 - Synlait: a reduction of emissions by 35% per kilogram of milksolids on-farm (-50% nitrous oxide, -30% methane and -30% carbon dioxide) and 50% per kilogram of milksolids off farm by 2028; and
 - Fonterra: global operations achieve net zero emissions by 2050, including interim targets of no increase in net on-farm emissions by 2030, and a 30% reduction in post-farm gate emissions by 2030 (from 2015 base year).

Conclusions

22. From the currently available evidence, an emissions reduction target in the range of 22-35% below 2016 levels by 2050 would be both consistent with the objectives of the Paris Agreement and achievable with the use of currently available technologies. Further emissions reductions beyond this range are likely to be achieved only if there is a significant breakthrough in mitigation technologies for agricultural emissions, or through land use change away from pastoral agriculture.

23. Based on the range above, we recommend that if a target for biological emissions is set in the Climate Change Bill, that the target be 25% below 2016 levels by 2050. We consider that this would be consistent with the objectives of the Paris Agreement to limit global warming to below 1.5°C, and would represent a realistic emissions reduction that can be achieved with currently known technologies and avoiding significant land use change. In keeping with the PCE's findings, a reduction of 25% would allow a more gradual initial reduction in emissions at the expense of a deeper cut by 2050 compared with a 22% target.
24. Emissions reductions beyond 25% could be achieved at reasonable cost if there were breakthrough in methane mitigation technologies. We therefore recommend that the target be periodically reviewed by the Climate Commission to ensure that the target keeps pace with the development of mitigation technologies and their cost.

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