



Climate Change Response (Zero Carbon) Amendment Bill: supplementary information for the Environment Select Committee

Date Submitted:	11 July 2019	Tracking #: 2019-B-05777	
Security Level	██████████	MfE Priority:	Non-Urgent

	Action sought:	Response by:
To Hon James Shaw, Minister for Climate Change	<ul style="list-style-type: none"> Approve the proposed responses to the Environment Select Committee before Friday 12 July. 	11 July 2019

Actions for Minister's Office Staff	Return the signed report to MfE.
Number of appendices and attachments # 1	1. Appendix 1: Climate Change Response (Zero Carbon) Amendment Bill supplementary information for the Environment Select Committee prepared by the Ministry for the Environment
Note any feedback on the quality of the report	

Ministry for the Environment contacts

Position	Name	Cell phone	1 st contact
Principal Author	Marieka Curley		
Principle Advisor	Lewis Stevens	9(2)(a)	✓
Director	Janine Smith		

Climate Change Response (Zero Carbon) Amendment Bill: supplementary information for the Environment Select Committee

1. The purpose of this briefing is to provide you with the draft response to the Environment Committee's written questions, of 24 June, on the science underpinning the Climate Change Response (Zero Carbon) Amendment Bill (the **Bill**).

Draft response

2. On 24 June, the Environment Committee asked officials to provide supplementary information on the science underpinning the Bill via a series of written questions.
3. A draft response to these written questions is attached at Appendix 1, for your review.
4. The response takes into account your earlier feedback. We have also worked with the office of the Parliamentary Commissioner for the Environment (**PCE**) on the response.
5. In respect of your feedback on question three, we have added material on the economic impacts of the target choice. We recommend retaining the material around the scientific justification for the split gas target.
6. The PCE have indicated they are comfortable with the response, aside from:
 - a. statements that nitrous oxide and carbon dioxide are exchangeable with respect to their impact on the climate on timescales of a few centuries. We stand by these statements.
 - b. the answer to question two, which we have drafted based on the rationale for the spilt between biogenic methane and all other greenhouse gases. This rationale means the target does not set a specific reduction for nitrous oxide, and does not need to rely on the figures for nitrous oxide in the Intergovernmental Panel Climate Change report.

Next Steps

7. A written response needs to be provided to the Environment Committee by Friday 12 July.
8. Please review and approve the draft response in Appendix 1. Following your approval, we will provide the response to the Environment Committee before the end of the day on Friday 12 July.

Recommendations

9. We recommend that you:

- a. **Agree** to provide the Environment Committee with the proposed response (attached at Appendix 1) to their written questions on the science underpinning the Climate Change Response (Zero Carbon) Amendment Bill.

Yes/No

Signature



Lewis Stevens-Rembe
Principle Advisor
Climate Directorate

10/7/19

Hon James Shaw
Minister for Climate Change

Date

Appendix 1

Climate Change Response (Zero Carbon) Amendment Bill Supplementary Information for the Environment Select Committee

Prepared by the Ministry for the Environment

On 24 June 2019, the Environment Committee asked the following questions of officials:

	Question	Answer
1	The Explanatory Note for the Bill (page 4) states that the IPCC 1.5C report concluded that in the central range of global scenarios consistent with staying within 1.5C, with limited or no overshoot, required CO ₂ to reduce to zero and methane to reduce 24 – 47%, what did the IPCC report say for nitrous oxide?	<p>The Intergovernmental Panel on Climate Change (IPCC) assessment describes scenarios consistent with limiting global warming to 1.5 degrees Celsius with limited or no overshoot. As stated in the quote from the report in your Q9, they do not indicate requirements.</p> <p>In these scenarios, the central range of reductions in nitrous oxide emissions is -26% to +1% relative to 2010 levels by 2050.</p>
2	Why has the IPCC report not been used to set the target for nitrous oxide?	<p>The global pathways assessed in the IPCC report illustrate future global scenarios that are compatible with a 1.5°C world. The report does not make recommendations for national targets for nitrous oxide or any other individual greenhouse gas.</p> <p>The Bill sets a joint target for all gases other than biogenic methane because these gases have a comparable temperature impact over timescales of a few centuries. Combining them also provides greater flexibility in terms of how the target can be met compared to setting separate targets for individual gases.</p> <p>The Climate Change Commission must consider the amount by which each greenhouse gas must be reduced as part of its advice to government on emissions budgets.</p>
3	Why have we split short and long lived gases in setting a target?	<p>New Zealand’s current emissions reduction targets include all gases in a single basket, but short and long-lived gases behave differently in the atmosphere and have different contributions to warming. Splitting the gases into two groups allows us quantify the temperature outcomes of the targets. The</p>

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		<p>long-lived gases are exchangeable with regard to their effect on temperature over timescales of a few centuries.</p> <p>Economic modelling indicated that a net-zero all-gases targets would require greater land use change and have greater impacts on the agricultural sector. This was a consideration in opting for a split-gas target over a net-zero all-gases target.</p> <p>In coming to a decision on the target, the Government also considered the broader potential economic impacts and the international context alongside the scientific evidence.</p>
4	In calculating the pathways for different gases, does the IPCC use a split gas approach for short and long-lived gases?	<p>No, the scenarios assessed by the IPCC investigate how mitigation of different gases in different sectors can be combined to reach a given global temperature outcome at least cost. The assumptions used include various possible scenarios for technological progress, as well as social and economic trends. The results are then aggregated and reported by gas.</p>
5	Has the belief that short-lived gases do not need to reduce to zero been based on the IPCC 1.5C report, if so, what page number?	<p>The understanding that, to limit warming to 1.5°C, short-lived gases do not need to reduce to zero pre-dates the IPCC 1.5°C report. But it is also clearly stated in Cross-Chapter Box 2: “Measuring Progress to Net Zero Emissions Combining Long-Lived and Short-Lived Climate Forcers [SLCFs]”, on page 66.</p> <p>An extract from this box says:</p> <p>“Natural processes that remove CO₂ permanently from the climate system are so slow that reducing the rate of CO₂-induced warming to zero requires net zero global anthropogenic CO₂ emissions, meaning almost all remaining anthropogenic CO₂ emissions must be compensated for by an equal rate of anthropogenic carbon dioxide removal (CDR). In contrast, sustained constant emissions of a SLCF such as methane, would (after a few decades) be consistent with constant methane concentrations and hence very little additional methane-induced warming.”</p>

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		(extract simplified by removing references)
6	Does the IPCC report state that nitrous oxide emissions need to reduce to zero to avoid 1.5C of warming, if so, what page number?	The report does not make that statement.
7	If the assumptions in the IPCC models were changed to assume nitrous oxide could be mitigated at a lower cost, would that impact the calculated pathway for methane? (i.e. are reduction interchangeable)	<p>There are a number of pathways outlined in the report, all with different inputs and assumptions, and all producing different trajectories for each gas. The biogenic methane target in the Zero Carbon Amendment Bill is based on the ensemble of model pathways in the IPCC report limiting warming to 1.5 C with no or limited overshoot, that takes into account a range of assumptions.</p> <p>There is a trade-off between the emissions reductions of different greenhouse gases, with respect to achieving a warming goal.</p> <p>Different long-lived gases are directly exchangeable: for example, a reduction target could be achieved by reducing only CO₂ emissions, or only N₂O, or a combination of the two. All three options have essentially the same temperature benefit.</p> <p>If the assumptions in the models were changed, so that the abatement costs of nitrous oxide became lower than the abatement costs of methane, the resulting cost-effective pathways would be likely to feature greater reductions in global nitrous oxide emissions and lesser reductions in global emissions of methane, everything else being equal.</p> <p>But the trade-off between methane and nitrous oxide is not a straightforward exchange: the temperature contribution from long-lived gases depends on the total cumulative emissions, while the temperature contribution from short-lived gases depends primarily on current and recent annual emission rates.</p> <p>The complexity of this comparison between cumulative emissions, on the one hand, and</p>

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		recent rates, on the other, is an important reason for the adoption of the split target.
8	Why have we on one hand made a decision to take a split gas approach, but on the [other] hand based the level of our targets (for some gases) on models that allow different reductions in different gases to be interchanged?	<p>The models assessed in the IPCC report enable all greenhouse gas emissions and removals to be interchanged, in the sense that they identify global least-cost combinations of mitigation activities that are compatible with a given temperature objective. The IPCC report made clear that there are many ways to reduce emissions. This is why the Government has taken an approach that will allow flexibility to pursue cost-effective emissions reductions.</p> <p>As identified in the answers to Q3 and Q7 above, we have adopted a split gas approach in order to make the temperature outcomes of our target clearer, and considering the likely impacts of the target.</p>
9	In regards to all of the pathways presented in the IPCC report, why did the IPCC state, "These pathways illustrate relative global differences in mitigation strategies, but do not represent central estimates, national strategies, and do not indicate requirements"?	<p>That statement in the IPCC 1.5 C report refers to the four Illustrative Pathways in Figure SPM.3b. It is also generally true of any individual pathway.</p> <p>The emissions pathways, and IPCC products in general, are "policy-relevant but not policy-prescriptive"</p> <p>The IPCC states of its reports: <i>"They may present projections of future climate change based on different scenarios and the risks that climate change poses and discuss the implications of response options, but they do not tell policymakers what actions to take"</i></p>
10	What level of reduction in each of the three main gases would be required to have no further warming from 2050?	There is no single answer to that question, but the extract from the IPCC 1.5 C report provided in the answer to Q5 is a good explanation.
11	The IPCC report presents representative pathways for four different global scenarios, including one scenario described as a "Middle of the road scenario". Some scenarios have 'overshoot' of a 1.5C and require negative emissions in the second half of the century. Why have we used only those scenarios that have "limited or no overshoot"?	<p>The "middle of the road" scenario refers to the underlying assumptions of this pathway, drawn from the so-called "Shared Socio-economic Pathways" (SSPs).</p> <p>See Table 2.3 of the IPCC 1.5 C report (page 110) for more information about the different pathways.</p> <p>The choice of referring to pathways with no or limited overshoot is not a question of science.</p>

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		<p>The range for 1.5 C scenarios with “no or limited overshoot” is cited in the Figure SPM.3b of the IPCC 1.5 C report. This reflects the Government’s ambition for limiting global warming, as stated in Part 1 of the Bill.</p> <p>The central range of emissions reductions in 2050 for methane from agriculture in all 1.5 C scenarios including those with high overshoot is 11 to 41 percent below 2010 levels.</p>
12	Does the Paris Agreement address the issue of if temperature limits are to be achieved with limited or no overshoot?	No, there are no time constraints associated with the temperature goals in the Paris Agreement.
13	The IPCC 1.5 report states that available pathways that achieve a 1.5C limit with limited or no overshoot keep global CO2e emissions to 25 – 30 Gt by 2030, this contrasts to median estimates for Paris targets (NDCs) of 52-58 Gt by 2030 (page 95) – in other words, in order to be on a pathway with limited or no overshoot global emissions would need to be near half those countries have pledged. We understand that countries will resubmit targets by 2020 following the Talanoa Dialogue, but is it reasonable to base New Zealand policy on a pathway that is so far off where countries have thus far indicated they are willing to go?	Signatories to the Paris Agreement committed to pursue efforts to stay within 1.5°C of pre-industrial levels. The target in the Zero Carbon Amendment Bill aims to set New Zealand on a path to reduce emissions consistent with this global goal.
14	Were pathways with overshoot considered and, if so, why were they rejected?	The use of scenarios that limited global warming to 1.5°C with limited or no overshoot reflects the Government’s ambition for limiting global warming, as set out in Part 1 of the Bill.