We recommend that you refer to the Climate Change Response (Zero Carbon) Amendment Bill when considering your answers, which can be found [here](http://www.legislation.govt.nz/bill/government/2019/0136/latest/LMS183736.html).

If you have any questions about completing the call for evidence, please contact us via [feedback@ICCC.mfe.govt.nz](https://tepuna.mfe.govt.nz/otcsdav/nodes/11968990/feedback%40ICCC.mfe.govt.nz). Please include a contact number in case we need to talk to you about your query.

Please email your completed form by **12 noon, Friday 15 November 2019** to [feedback@ICCC.mfe.govt.nz](https://tepuna.mfe.govt.nz/otcsdav/nodes/11968990/feedback%40ICCC.mfe.govt.nz).We may follow up for more detail where appropriate.

**Contact details**

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| *Name and/or organisation* | Mike Manning GM Innovation & Strategy Ravensdown |
| *Postal Address* |  |
| *Telephone number* |  |
| *Email address* |  |

**Submissions on similar topics**

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| *Please indicate any other submissions you have made on relevant topics, noting the particular material or information you think we should be aware of.* |
| *Answer:*  Introduction  In addition to the responses provided to questions on this form, Ravensdown has attached the following documents to be considered as part of our response:   * BERG-report-future-options-FINAL-DEC-2018(3) * Climate Change Commission\_Ravensdown urease inhibitors 8 Oct 19 * DüV-Englisch * Robyn Dynes – Greenhouse gas mitigation strategies * Ravensdown Submission to Zero Carbon Bill July 2019   Other relevant submissions (not attached):  Ravensdown presented to the Select Committee on the Zero Carbon Bill on 16 August 2019.  Ravensdown as a member of FANZ submitted on the Zero Carbon Bill – 12 July 2019. See <http://www.fertiliser.org.nz/Site/submissions/> |

**Commercially sensitive information**

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| *Do you have any objection to the release of any information contained in your response, including commercially sensitive information?*  *If yes, which part(s) do you consider should be withheld, together with the reason(s) for withholding this information.* |
| *Answer:* No |

**Questions for consideration:**

**Section A The first three emissions budgets**

Under the proposed Zero Carbon Bill, the proposed Commission will have to provide advice to government on the levels of emissions budgets over the coming decades.

Currently, the Zero Carbon Bill requires budgets to be set from 2022-2035 (three separate budgets covering 2022-2025, 2026-2030, and 2031-2035). When preparing this advice the proposed Commission will have to consider the implications of those budgets for meeting the 2050 target. The Commission will also need to consider the likely economic effects (positive and negative) of its advice.

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| *Question 1:*  *In your area of expertise or experience, what are the specific proven and emerging options to reduce emissions to 2035? What are the likely costs, benefits and wider impacts of these options? Please provide evidence and/or data to support your assessment.* |
| *Answer:*  Urease Inhibitors coated on to urea fertiliser to reduce ammonia volatilisation and hence the subsequent indirect losses of nitrous oxide (see attached document). These products provide an advantage to farmers through more efficient nutrient use giving them the opportunity to use less nitrogen. Uptake by farmers has been increasing year on year. See Q 6 regarding overall impact on GHG emissions.  This technology is well established. See FANZ submission on the Zero Carbon Bill 12 July 2019  Evidence from “Pasture 21” farm system research shows wider changes to the farm system at the Lincoln University Dairy farm reduced Nitrate leaching by 25% and GHG reduction of 20% with no loss of production or profit (Paper attached). Although not all farms will be able to realise this level of improvement, it demonstrates that with the right support and incentives, material farm system improvements system are likely to be feasible for many dairy farms. |

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| *Question 2:*  *In your areas of expertise or experience, what actions or interventions may be required by 2035 to prepare for meeting the 2050 target set out in the Bill? Please provide evidence and/or data to support your assessment.* |
| *Answer:*  The point of obligation for greenhouse gas (GHG) emissions should be at the farm level, not the processor level. The reason for this is so those farmers who adopt technologies and management systems proven to reduce emissions are ‘rewarded’ for this behaviour change by having reduced emissions liabilities. Accounting on-farm provides for flexibility and innovation in approach to suit individual circumstance, to achieve improved efficiencies and productivity in a GHG efficient manner as discussed in Q1 and demonstrated by Lincoln Dairy farm.  Phased in reporting in conjunction with rapid development of capability in rural professionals to support farm system change plus incentives and support for uptake of mitigations will be required to help farmers achieve the required changes within the time frames indicated.  See Ravensdown and FANZ Submissions on the Zero Carbon Bill. |
| *Question 3:*  *In your areas of expertise or experience, what potential is there for changes in consumer, individual or household behaviour to deliver emissions reductions to 2035? Please provide evidence and/or data to support your assessment.* |
| *Answer:* We have no particular expertise in this area, but all citizens of New Zealand have the opportunity to examine their own behaviours, lifestyles and consumerism with respect to their personal GHG emissions and make changes accordingly. Incentives to take up mitigations with flexibility to select those best suited to individual circumstance will encourage change in behaviour faster than a generic tax impost on overall emissions. |

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| *Question 4:*  *When advising on the first three emissions budgets and how to achieve the 2050 target, what do you think the proposed Commission should take into account when considering the balance between reducing greenhouse gas emissions and removing carbon dioxide from the atmosphere (including via forestry)?* |
| *Answer:* Plantation forestry is only a temporary measure and is already significantly impacting on rural communities such as the East Coast region of the North Island.  See the Ravensdown submission on the Zero Carbon Bill. (attached)  Considerations of economic and social sustainability should be taken into account, (In addition, the transferability of New Zealand solutions to global farm system solutions will provide a significantly greater impact on global temperature control, than an approach which can only be applied in New Zealand, (0.17% of emissions). This strategic global applicability of viable solutions should also be considered. |

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| *Question 5:*  *What circumstances and/or reasons do you think would justify permitting the use of offshore mitigation for meeting each of the first three emissions budgets? And if so, how could the proposed Commission determine an appropriate limit on their use?* |
| *Answer:* The global applicability of New Zealand farm system solutions should be considered. Offshore mitigations and sequestration should be provided for, if the most GHG efficient food production is to support global food security with minimal GHG footprint. Use of offshore mitigations and sequestrations should be considered with the caveat that we have the opportunity to verify the integrity and validation of offshore GHG mitigations and sequestrations. |

**Section B Emissions reduction policies and interventions**

The proposed Commission will also need to consider the types of policies required to achieve the budgets it proposes. This consideration should include:

* sector-specific policies (for example in transport or industrial heat) to reduce emissions and increase removals, and
* the interactions between sectors and the capability of those sectors to adapt to the effects of climate change.

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| *Question 6:*  *What sector-specific policies do you think the proposed Commission should consider to help meet the first emissions budgets from 2022-35? What evidence is there to suggest they would be effective?* |
| *Answer:*  Compulsory use or incentivisation of use of urease and/or nitrification inhibitors coated on nitrogen fertilisers e.g., Urea, as is the case in Germany. See attached document: the German fertiliser ordinance which requires use of urease.  It requires that: Urea as a fertiliser may, from 1 February 2020, only be spread insofar as a urease inhibitor is added to it or is worked in without delay or at the latest within four hours of spreading. This was introduced in 2017 as part of a range of measures in response to the EU Commission concerns about high nitrate concentrations in groundwater.  Urea application is shown to cause GHG emissions of 588.26 kt CO2-e (which represents 1.5% of NZ’s Agricultural GHG emissions or 0.7% of NZ’s Gross emissions).  If all the urea purchased by NZ farmers was coated with a urease inhibitor a decrease of 4.1% in GHG emissions from Urea would be achieved. This is a drop of some 24.12 kt CO2-e from the 588.26 kt CO2-e emitted from Urea. Further reduction occurs as a result of reduced urea applications due to the efficiency gain from using inhibitors e.g. if volatilisation losses are prevented and urea application is reduced proportionally, e.g. 10 % there will be a corresponding further drop in emissions.  Funding support for discovery and development of effective nitrification inhibitors that can be targeted to the treatment of cattle urine spots to reduce both nitrate leaching and GHG emission risk. Legislative authority to use proven and safe products will also be required. |

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| *Question 7:*  *What cross-sector policies do you think the proposed Commission should consider helping meet the first emissions budgets from 2022-35? What evidence is there to suggest they would be effective?* |
| *Answer:*  The Commission needs to consider the co-benefits of other polices:  Current proposals on water policy are largely directed at reduction of nitrate loss to rivers. Measures taken in response to national direction on water are likely to have a positive impact for GHGs. The BERG report estimated that for every 1 kg reduction in nitrate leaching there was an associate 0.4 kg reduction in GHG loss. See New Zealand’s freshwater reforms: What are the potential impacts on Greenhouse Gas emissions  <https://www.mpi.govt.nz/dmsdocument/16855-new-zealands-freshwater-reforms-what-are-the-potential-impacts-on-greenhouse-gas-emissions>.  Water polices are generally assumed to result in a 10-20% reduction in N loss nationally However assessments undertaken have indicated varying levels of mitigation.  An assessment of climate mitigation co-benefits arising from the Freshwater Reforms (<https://www.mpi.govt.nz/dmsdocument/16849-an-assessment-of-climate-mitigation-co-benefits-arising-from-the-freshwater-reforms>) This report showed a reduction in N loss of 13% and GHG reduction of 8% (on the basis of 100% implementation). (It then assumes only 30% implementation)  Modelling the potential impact of New Zealand’s freshwater reforms on land-based Greenhouse Gas emissions. <https://www.mpi.govt.nz/dmsdocument/16858-modelling-the-potential-impact-of-new-zealands-freshwater-reforms-on-land-based-greenhouse-gas-emissions> Estimates a 2.5% reduction in N loss nationally. However, they only had targets from a small number of councils and assumed that there would be no change in the other catchments – so you can assume that it will be an underestimate of N/GHG reduction.  The PCE report on Overseer released in December 2018 (<https://www.pce.parliament.nz/media/196493/overseer-and-regulatory-oversight-final-report-web.pdf>) acknowledges Overseer estimates gaseous emissions from farms: carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), all of which are significant GHG’s (page 45). The report also calls for additional investment into Overseer to further improve the model.  Estimates of GHG emissions on a farm basis using Overseer will assist farmers to decide what changes they could make on farm to reduce emissions and remodelling of the system change(s) would show the improvement.  In addition, investment in extension and support for developing rural professional capability over realistic timeframes and working with existing industry initiatives will be critical to success. |

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| *Question 8:*  *What policies (sector-specific or cross-sector) do you think are needed now to prepare for meeting budgets beyond 2035? What evidence supports your answer?* |
| *Answer:*  In the interests of fairness only one model should be used to calculate on farm emissions (e.g., Overseer).  However, as above, phased introduction, realistic timeframes, and investing in building capability are key. A simplified ‘look-up table/ basic model’ approach to provide for farm systems which do not need a detailed farm GHG calculation could assist with capability demands in the very short term, while providing for on-farm GHG reporting. |

**Section C Impacts of emissions budgets**

The proposed Commission will need to consider the potential social, cultural, economic and environmental impacts of emission budgets on New Zealanders, including how any impacts may fall across regions and communities, and from generation to generation. Potential impacts may be either positive or negative.

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| *Question 9:*  *What evidence do you think the proposed Commission should draw upon to assess the impacts of emissions budgets?* |
| *Answer:*  It will be important for the Commission to not consider GHG emissions and reductions in isolation from other nutrient emissions on farm, as the danger in doing this will be possible occurrence of “pollution swapping” where, for example, technologies implemented on farm to reduce nitrate leaching e.g., barns/pads can result in greater emissions of methane. A farm systems approach is required. As mentioned above, a farm system approach which has global application will have greater impact on atmospheric temperature, than a New Zealand specific solution which cannot be adopted internationally. |
| *Question 10:*  *What policies do you think the proposed Commission should consider to manage any impacts of meeting emissions budgets? Please provide evidence and/or data to support your assessment.* |
| *Answer:*  Policies should be supported when they provided: ‘ On-farm accounting for GHG emissions’, ‘realistic timeframes to implement and scale up mitigations’, ‘investment in developing tools and also capability for extension and support services’, ‘investment for incentives for adoption of mitigation options, rather than using blunt instruments such a universal tax/ carbon price to achieve behaviour change. For example, experience has shown the increasing price of nitrogen fertiliser cannot be used to drive reduction in use- see Fertiliser Association submission on Future Tax (<http://www.fertiliser.org.nz/Site/submissions/>) |

**Section D Other considerations, evidence or experience**

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| *Question 11:*  *Do you have any further evidence which you believe would support the future Commission’s work on emissions budgets and emissions reduction policies and interventions?* |
| *Answer:* |

Please email your completed form to [feedback@ICCC.mfe.govt.nz](https://tepuna.mfe.govt.nz/otcsdav/nodes/11968990/feedback%40ICCC.mfe.govt.nz) by **12 noon, Friday 15 November 2019.**

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