Hon Damien O'Connor

MP for West Coast-Tasman

Minister of Agriculture
Minister for Biosecurity
Minister for Food Safety
Minister for Rural Communities

Associate Minister for Trade and Export Growth

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Simon Upton
Parliamentary Commissioner for the Environment
PO Box 10241
Wellington 6143

Dear Simon

Thank you for your correspondence of 28 March requesting information on actions the Ministry for Primary Industries (MPI) is undertaking in response to climate change issues highlighted in the environmental report *Our atmosphere and climate 2017*. Your request allows me both to highlight current work and identify further opportunities for MPI to address the issues raised in *Our atmosphere and climate 2017*.

You quoted the following sentence from the report: *"Agricultural emissions from livestock digestion (mostly methane) rose 5 percent, while emissions from agricultural soils (mostly nitrous oxide from nitrogen fertiliser use and excrement from grazing livestock) rose 51 percent."* Emissions rose from 1990 to 2005 and have subsequently stabilised. In 2016, emissions from agriculture were 3.6 per cent lower than the 2005 peak. The following questions have been answered in light of your statement above:

1. *What work has the Ministry done to identify what is driving the increases in agricultural emissions cited above, or what may be done to reverse their upward trend?*

The Greenhouse Gas Inventory shows that the drivers of increases from 1990 to 2005 were an increase in the population and productivity of dairy cattle and an increase in the use of synthetic nitrogen fertilisers, partially offset by a decrease in the population of sheep and non-dairy cattle. Drivers of the stabilisation in emissions since 2005 include the National Policy Statement for Freshwater Management, economic conditions, commodity prices and climatic conditions over this period.

New Zealand farmers have consistently made improvements in farming systems – to have some of the lowest biological emissions per unit of agricultural product (emissions intensity) globally. Without these improvements, agricultural emissions would have increased by almost 40 per cent to produce the same amount of food.

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MPI is working across government and engaging industry in building evidence, through robust research, and supporting industry actions to reduce agricultural emissions. Examples of this are:

- the Biological Emissions Reference Group (BERG), which is working to build a robust evidence base on what farmers can do on-farm to reduce emissions. The BERG consists of Fonterra, Deer Industry NZ, DairyNZ, Fertiliser Association, Horticulture New Zealand, Federated Farmers New Zealand and Beef + Lamb New Zealand.
- Dairy Action for Climate Change (DACC) is an industry-led initiative supported by MPI and MfE which is working to increase farmers' awareness and capabilities surrounding on-farm mitigation options.

2. *What targets or goals, if any, has the Ministry set for reducing domestic emissions of greenhouse gases from the primary sector?*

MPI, as part of the Government, has committed to economy-wide targets under the United Nations Framework Convention on Climate Change (UNFCCC), allowing for flexibility to find emissions reductions across the economy. MPI provided advice to Ministers on New Zealand's 2030 target and is actively engaged in developing options for a 2050 domestic emissions target. These economy-wide targets are reflected in MPI's policy advice, research fund objectives and industry engagement.

Sustainability is one of four outcomes in MPI's strategy. For MPI this means "New Zealand's natural resources are sustainable, in the primary sector". MPI measures the agricultural greenhouse gas emissions per unit of production to measure progress against the strategy; this indicator is reported publicly in the annual report. Emissions intensity has decreased since 1990, whilst this is not a goal that MPI has explicitly set, it shows MPI's progression towards the sustainability outcome.

3. *What work has the Ministry done or is planning to do with other government agencies to address issues where greenhouse gas reductions require co-ordinated actions from multiple stakeholders?*

MPI are already involved across a number of groups that are addressing the need for co-ordinated actions required to reduce greenhouse gas emissions in the agricultural sector. These include:

- MPI set up the Biological Emissions Reference Group (BERG) in 2016, alongside various industry and government groups. The purpose of the BERG is to agree an evidence base on what the agricultural sectors can do now, and in the future, to reduce on-farm biological emissions, and to assess the costs and opportunities of doing so. The BERG plans to publish a final report in mid-2018. The final BERG report will be an important piece of evidence in determining what role agriculture can play in climate policy.

- MPI are actively engaged with DairyNZ, in partnership with Fonterra, in leading the Dairy Action for Climate Change (DACC) initiative. The purpose of the DACC is to raise awareness in the dairy sector about what farmers can do to reduce emissions on-farm. The DACC is delivering this through a combination of road shows for rural professionals (completed in October 2016) and farmers (February and June 2018), demonstration farms to pilot mitigation measures and showcase how they can be implemented on real farms, and a methane benchmarking pilot run by Fonterra with 100 of its suppliers.

- MPI co-invests with industry through initiatives such as the Primary Growth Partnership (PGP), which invests in long-term innovation programmes to increase the market success of the primary industries.

- MPI is part of the interagency Transition Hub, which is made up of representatives from government agencies in the natural resources sector. The Transition Hub will provide the Government advice during the development of the Zero Carbon Bill, and on the transition to a low emissions and resilient economy. A key function of the Transition Hub is to connect and support government agencies in developing policy advice.

Through these processes MPI are working with other agencies and sector stakeholders to build a common understanding of the opportunities to reduce emissions in the sector, and their implications. However, MPI acknowledges making policy decisions without considering the need for co-ordinated action are likely to be unsuccessful. Therefore MPI will continue to work with stakeholders to ensure continued sector engagement.

4. *What work has the Ministry done to consider the relative contributions to greenhouse gas mitigation from domestic action and international efforts — be they purchasing international carbon credits or other actions?*

New Zealand's agricultural products have lower emissions intensities than those from many other countries. The Government has prioritised research into understanding biological emissions and improving farm practices; we have an opportunity to provide global leadership on sustainable food production. New Zealand can play a unique role in this via our knowledge of running highly efficient pastoral agriculture systems.

New Zealand is committed to continuing to make emissions reductions at home and recognises the importance of building strategic alliances and catalysing action globally. This is reflected in New Zealand's investment in global-good research and development, through the Global Research Alliance on Agricultural Greenhouse Gases (GRA), to better understand the global drivers and opportunities for emissions reductions from the agricultural sector, including improving productivity, which can contribute to the wider Paris Agreement goals. The purpose of the GRA is to bring countries together to find ways to grow more food without growing greenhouse gas emissions. MPI contributes to collaborative research projects into the mitigation of greenhouse gas emissions and scientific capability-building activities.

The New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC) is funded via MPI's Primary Growth Partnership, and coordinates research on agricultural greenhouse gas emissions and their mitigation. Their work includes research on breeding low emissions traits in sheep, developing methane vaccines and inhibitors, increasing soil carbon stocks, and reductions of nitrous oxide emissions and nitrogen leaching. This work helps reduce agricultural emissions both in New Zealand and internationally.

New Zealand has also invested significant resources in partnerships with other initiatives, such as the Climate and Clean Air Coalition (CCAC), Food and Agriculture Organization of the United Nations (FAO), regional development funds such as the Inter-American Development Bank, and raising awareness with farmers in partnership with the World Farmers' Organisation. This recognises that each country's contribution to meeting climate change outcomes is nationally determined and requires in-country expertise and leadership.

The relative contributions to NZ targets from either domestic or international sources, or how New Zealand utilises international markets is yet to be finalised, and is part of on-going Government-wide discussion and analysis. MPI is contributing to these discussions.

You mentioned that the impacts of climate change described in *Our atmosphere and climate 2017* will lead to New Zealand being increasingly exposed to the risk of new pests and diseases. The following questions have been answered in light of this statement:

5. *What work has the Ministry done on the biosecurity risks that climate change poses for native biodiversity, and agricultural production and market access?*

MPI has set up in advance procedures for new incursions of pests and diseases. This is driven not by climate change, but by the desire to maintain our current animal and plant health status.

If a new pest or disease were to establish in New Zealand, the impacts on our market access will depend on which pest or disease it is, human, animal or plant health impacts associated with that pest or disease, treatments available and whether our trading partners also have it.

New Zealand is free from many of the pests and diseases that impact on trade. A number of these diseases are not considered risks because we do not have the vector for them. We do have surveillance for certain exotic pests, and if climate change leads to their occurrence, measures on the exotic disease agents they carry would also be immediately put in place. However, until this occurs our controls do not apply for that disease. We also monitor emerging risks overseas because climate change is changing the distribution of pests and diseases. This type of information, if it is available, would be considered as an input into the development of import health standards.

The Sustainable Land Management and Climate Change (SLMACC) research programme helps the agriculture and forestry sectors with the challenges arising from climate change. The research programmes objectives are to:

- enhance and support adaptation to climate change
- reduce agricultural greenhouse gases
- encourage the establishment of forest sinks
- manage deforestation
- capitalise on new business opportunities arising from the world's response to climate change.

This research has identified both challenges and opportunities resulting from climate change. Challenges identified are in biosecurity; with concern being the potential establishment of new exotic pests, weeds and diseases which are currently prevented by New Zealand's climate. Climate change will also create opportunities for new crop types to be grown commercially in some sectors. SLMACC programme research has also identified the risk of more frequent, prolonged and severe seasonal droughts which will impact the primary production sectors.

6. *More broadly, what is the Ministry's strategic approach to dealing with the risks that climate change poses to New Zealand's agricultural sector, including biosecurity, food safety and agricultural infrastructure?*

MPI is continuing to engage with and support the industry to adapt to climate change through research, development and building awareness. MPI is ensuring that the agricultural sector is aware of the challenge that climate change poses, as well as the opportunities for mitigation and adaption. MPI is considering options for biosecurity settings, farm-systems change, alternative land use, and supporting the agriculture sector to deal with climate change risks through:

- SLMACC research, which helps the agriculture and forestry sectors identify risks and opportunities arising from climate change
- engagement with National Science Challenges, particularly the Deep South Challenge, and Resilience to Natural Hazards Challenge
- development projects that focus on areas affected by climate change, including the Irrigation Acceleration programme and Erosion Control programmes, ensuring that the agriculture industry is more robust to changes in climate
- increasing value capture from markets to enable economic sustainability and help fund the transitions needed
- adverse events policy that supports rural communities and individuals recover from natural disasters, severe weather and biosecurity incursions
- engagement with industry through BERG and DACC, that focus on mitigation options for agriculture
- the Farm Systems Change – Optimising Dairy initiative, which shows there is significant potential for the dairy sector to find an optimal production level within environmental and societal limits, without compromising economic outcomes
- Biosecurity 2025 which will strengthen New Zealand's biosecurity system to ensure that our system continues to protect against pests and diseases

7. Has any work been done to estimate the cost of these risks?

MPI has invested in assessing the changes in climate and what risks this poses to biosecurity, biodiversity, food security and farm-systems as mentioned above. Modelling the cost of complex scenarios that arise from climate change is difficult due to the number of factors involved. Knowledge of the cost of erosion damage (annual costs estimated at $100 million to $150 million), which will increase as the risk and magnitude of extreme weather events increases, has motivated programmes such as the Hill Country Erosion Programme.

8. What climate related research areas (and to what extent) is the Ministry funding, and how are funding areas and priorities decided upon?

There are five funds that are dedicated to climate change research within MPI that cover different aspects of the complex climate change spectrum. They are listed below:

	Budget 2017/18
Sustainable Land Management and Climate Change – technology transfer	$773,134 OBU
Sustainable Land Management and Climate Change – Research Addresses research on impacts and adaptation, land use change, forestry, mitigation and crosscutting issues	$3,302,962 OBU
Greenhouse Gas Inventory research supports UNFCCC reporting	$1,857,000 OBU
NZ Agricultural Greenhouse Gas Research Centre Carries out research on Methane, Nitrous oxide, soil carbon, decision support tools, demonstration, science capacity building, Māori engagement	$4,850,000 PGP appropriation
Global Research Alliance Supports NZ membership and international skills, extension and research programmes	$6,500,000 (annual phasing of total $65m from 2010 to 2020)
Total MPI funding	$17,013, 096

There are also programmes or parts of programmes that can be attributed to directly or indirectly support climate change through the **Primary Growth Partnership** and **the Sustainable Farming Fund**.

Priorities for each of these funds is set using different mechanisms but all involve using expert committees/panels with senior level sign off on priorities. Both national and international experts may be used.

You mentioned the impacts of ozone depleting substances (ODS) and raised that nitrous oxide is now the most significant remaining ODS, and also a potent greenhouse gas. The following question has been answered in light of that statement:

9. *What work is being undertaken to ensure a coordinated approach to managing nitrous oxide with respect to climate change, ozone concentrations, and water quality?*

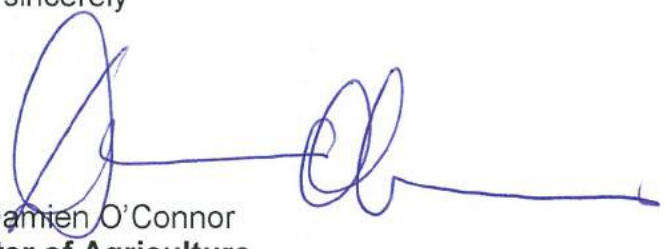
MPI has funded past and current research that shows that there are both synergies and trade-offs with managing nitrous oxide to achieve climate change, ozone and water quality goals. MPI has been supporting water policy development including the National Policy Statement for Freshwater Management which seeks to address nitrogen levels in waterways. Work carried out under the SLMACC programme has indicated that these areas are aligned. There are co-benefits of the National Policy Statement for Freshwater Management on agricultural greenhouse gas emissions, these include reduced nitrogen leaching to waterways, which will decrease nitrous oxide emissions, and reduced stocking rates, reducing nitrous oxide and enteric methane emissions. A significant amount of work has also been carried out for the Agricultural Inventory through the greenhouse gas inventory fund to better understand nitrous oxide emissions.

MPI is working with Ministers and Overseer Limited on the future direction of Overseer. Overseer is a key tool for improving farm management practices to reduce nitrogen loss to waterways and potentially reduce greenhouse gas emissions. Overseer is currently the only tool available that can estimate nitrous oxide leaching both through the root zone and into the atmosphere. This work will look at how we can ensure the model receives necessary improvements and keep options for Overseer's use open.

This past work has laid the foundation for MPI to develop future policy that harnesses these synergies and effectively manages nitrous oxide with respect to climate change, ozone concentrations, and water quality.

Thank you again for highlighting the issues raised in *Our atmosphere and climate 2017* and the opportunity to discuss current work and future opportunities for MPI to engage with industry and address these issues.

Yours sincerely



Hon Damien O'Connor
Minister of Agriculture

CC: Hon Stuart Nash, Minister of Fisheries; Hon Shane Jones, Minister of Forestry; Hon Meka Whatiri, Associate Minister of Agriculture