



s 9(2)(a)

17 November 2022

Tēnā koe s 9(2)(a)

Thank you for your email of 10 October 2022 requesting additional information in response to answers you had received from the Ministry for the Environment (the Ministry) under the Official Information Act 1982 (the Act) on 19 September 2022.

On 18 October 2022, the Ministry contacted you to seek clarification on your request. You provided this clarification on 19 October.

On 19 October 2022, the Ministry advised you that the following parts of your request had been transferred to the Climate Change Commission, in accordance with section 14 of the Act, as this information was believed to be more closely related to the functions of the Commission:

- Part of Question 6;
- Part of Question 9; and
- Part of Question 11.

#### **Response to your request**

I have addressed each of your questions individually below.

**Question 1:** *My supplementary question is, when will the public be advised why is there a need to reduce agricultural GHG emissions? The answer must not affect the building of the sectors resilience to climate change. There is just no evidence the two matters are related. If there is then please tell me? Please also note a recent quote by Bryce Edwards; "Bureaucracies are essentially abusing the OIA by keeping public information secret, or at least delaying its release, and manipulating the process to suit authorities and politicians."*

**Clarification provided for Question 1:** *Regarding your enquiry, the two matters are as follows;*

1. *The need to reduce agricultural GHG emissions.*

*and*

2. *The building of the sectors resilience to climate change.*

*I say there is no connection between the need to reduce agricultural GHG emissions and the ability of the agricultural sector to recover from difficulties of climate events. The two matters are not related. Emissions are not the cause of climate change variations or extreme events.*

*My question remains; why is there a need to reduce methane, nitrous oxide and carbon dioxide emissions?*

*If you can answer that, then how can the reduction of emissions have any effect on mitigating the risks and possible farm damage and losses that maybe the cause of climatic events such as floods and slips?*

Reductions in agricultural emissions are required to meet Aotearoa New Zealand's domestic and international emissions reductions targets. Methane makes up 40% of the total warming effect generated by human activities. While it is a relatively short-lived gas, it is very effective at heat trapping, adding to changes in the global climate system, resulting in warming effects beyond its lifetime. Nitrous oxide and carbon dioxide are long-lived gases, staying in the atmosphere for centuries and millennia, respectively. Every unit of gas added today, therefore, adds to past emissions remaining in the atmosphere increasing concentrations.

Reducing the continuing accumulation of emitted gases in the atmosphere is critical to keep warming to well below two degrees Celsius above pre-industrial levels. This will lead to a slowing of climate change and its effects on the earth and atmosphere. The agriculture sector, which makes up nearly half of Aotearoa New Zealand's greenhouse gas emissions, is a crucial part of this transition. Between 2016 and 2017 agriculture was responsible for 48 percent of New Zealand's greenhouse gas emissions. For this reason, the Government has set domestic emissions reduction targets that align with limiting global warming to 1.5 degrees Celsius.

This information, and further information, is already publicly available at [Greenhouse gases: Farm Planning Guidance; Action on agricultural emissions](#)

**Question 2:** *Which Ministry will be responsible for the updating and maintenance of the GHG inventory, if and when it might be finally approved?*

The Ministry for the Environment is the lead agency responsible for producing, updating, and maintaining the Greenhouse Gas Inventory.

The 2023 New Zealand Greenhouse Gas Inventory, covering data from 1990-2021, will be published on 13 April 2023.

**Question 3A:** *Please provide the specific clauses in the IPCC report that MfE have relied on as the factual and scientific evidence to answer the questions.*

- a) *Methane contributes to global warming*
- b) *Methane keeps the planet a lot warmer.*

*Please advise who was the qualified person who scientifically fact checked the IPCC Clauses?*

*The IPCC use computer modelling and the estimated 0.5°C warming has not been proven to be due to methane.*

Our original statement was “While methane is a short-lived gas, breaking down in the atmosphere after approximately 12 years, every tonne of methane that is emitted contributes to global warming. Even if stable, ongoing methane emissions keep the planet a lot warmer than it would be otherwise.”

The evidence for this statement comes from the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report on the Physical Basis of Climate Change. The specific sections of the report where this was drawn from include:

- Summary for Policymakers, Figure SPM.2 | Assessed contributions to observed warming in 2010 – 2019 relative to 1850 – 1990, page 7. This shows that methane has contributed an estimated 0.5°C to 2010 – 2019 warming, relative to 1850 – 1990. This assessment is from radiative forcing studies. The summary for policymakers is available here: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf)
- Chapter 6, Short-lived Climate Forcers, page 821 states: “For SLCFs [Short-lived Climate Forcers] including methane, the rate of emissions drives the long-term global temperature effect, as opposed to CO2 for which the long-term global temperature effect is controlled by the cumulative emissions”. This shows that ongoing emissions from methane and other short-lived climate forcers is driving temperatures. This distinguishes methane and other short-lived climate forcers from long-lived greenhouse gases including CO2. Chapter 6 is available here: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Chapter06.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter06.pdf)

Reports produced by the IPCC are built on an extensive literature base, which ensures that there is a comprehensive assessment of the scientific, technological, and socio-economic information to prepare a clear view of the current state of scientific knowledge relevant to climate change. A rigorous drafting and review process occurs for all IPCC content to guarantee a comprehensive report, objectivity, and transparency. Expert reviewers and governments are invited at different stages to comment on the scientific, technical, and socio-economic assessment and the overall balance of the drafts. The review process includes wide participation, with hundreds of reviewers critiquing the accuracy and completeness of the scientific assessment contained in the drafts.

The Ministry does not carry out fact checking of the IPCC clauses, it accepts the knowledge of the global scientific consensus on climate change summarised by the IPCC, and their process for review and correcting errors.

For more information on the literature the IPCC assesses, see:

[https://www.ipcc.ch/site/assets/uploads/2018/02/FS\\_ipcc\\_assess.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/FS_ipcc_assess.pdf)

For more information on the IPCC review process, see:

[https://www.ipcc.ch/site/assets/uploads/2018/02/FS\\_review\\_process.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/FS_review_process.pdf)

For more information on how the IPCC deals with alleged errors see:

[https://www.ipcc.ch/site/assets/uploads/2020/06/FS\\_ipcc\\_deals\\_errors\\_2020.pdf](https://www.ipcc.ch/site/assets/uploads/2020/06/FS_ipcc_deals_errors_2020.pdf)

**Question 3B:** CO2 to net zero by 2050 is vital to limit temperatures to 1.5°C.

Please advise who was the qualified person who scientifically fact checked the IPCC Clauses; that MfE are relied on? Did you consult with the information provided in the paper by Coe et al.?

The evidence for this statement comes from the IPCC Sixth Assessment Report on the Physical Basis of Climate Change Summary For Policy Makers (D.1, page 27), which states: "From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO2 emissions, reaching at least net zero CO2 emissions, along with strong reductions in other greenhouse gas emissions." The summary for policymakers is available here:

[https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf)

Further evidence comes from the IPCC Special Report on Global Warming of 1.5°C Summary for Policymakers (C.1, page 11) which states: "In model pathways with no or limited overshoot of 1.5°C, global net anthropogenic CO2 emissions decline by about 45% from 2010 levels by 2030 (40–60% interquartile range), reaching net zero around 2050 (2045–2055 interquartile range)." The summary for policymakers is available here: <https://www.ipcc.ch/sr15/chapter/spm/>

As stated above, the Ministry does not carry out fact checking of the IPCC clauses, it accepts the knowledge of the global scientific consensus on climate change summarised by the IPCC, and their process for review and correcting errors.

The science of climate change has been established through lab-based studies, computer modelling and observational evidence, all of which support the link between increased carbon dioxide in the atmosphere and global warming. This science is explained in many peer-reviewed, and publicly available forums and reports, including the Assessment Report of the IPCC. The IPCC Sixth Assessment report on the Physical Basis of Climate change is available here:

<https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>.

The Coe et al. paper does not change the Ministry's acceptance of the global scientific consensus on the science of climate change, and the evidence that increasing levels of CO<sub>2</sub> contributes to increasing global temperatures.

**Question 4:** What is the "standard reporting format" that is set out in the Conference of Parties? What are the "standardised requirements for reporting national inventories"?

Please ensure that your answers include the specific determination of the Agriculture and Waste Sectors, as noted in my request 16 August. The lack of transparency needs to be avoided please.

The standard reporting format for National Greenhouse Gas Inventories set out by the Conference of the Parties includes:

- Common reporting format (CRF) tables, which are a set of standardised data tables containing quantitative information. The CRF tables for New Zealand's 2022 Greenhouse Gas Inventory can be accessed here: <https://unfccc.int/documents/271550>
- A National Inventory Report, which is "a report containing transparent and detailed information on the inventory. It should include descriptions of the methodologies used in the estimations (including references and sources of information), the data sources, the institutional arrangements for the preparation of the inventory (including quality assurance

and control procedures), and recalculations and changes compared with the previous inventory.” The NIR for New Zealand’s 2022 Greenhouse Gas Inventory is available here: <https://environment.govt.nz/assets/Publications/New-Zealands-Greenhouse-Gas-Inventory-1990-2019-Volume-1-Chapters-1-15.pdf>

The standard requirements for reporting national inventories follow the 2006 IPCC guidelines for National Greenhouse Gas Inventories. This guidance is publicly available and can be accessed here: <https://www.ipcc-nggip.iges.or.jp/public/2006gl/>. Agriculture guidelines can be found here: <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>. Waste guidelines can be found here: <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html>.

More information on UNFCCC reporting requirements can be found here: <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/reporting-requirements>

**Question 5:** *I say CO<sub>2</sub> exhaled by humans is acceptable and is not a problem that needs your control. What is the point and your scientific evidence*

- a) *That supports your answer to question 5 above?*
- b) *That confirms human’s intake of food is equal to, and therefore is a balance with, what the same 5 million humans (4%) exhale as CO<sub>2</sub>, during a given period?*
- c) *If plants use the human CO<sub>2</sub> to ‘produce energy’ then surely plants also use the CO<sub>2</sub> from many other sources for the same ‘energy.’*

*The result must be that CO<sub>2</sub> emissions do not need to be included in the National inventory.*

*What then is the total percentage of CO<sub>2</sub> NOT used by all plants (and all humans) and included in your ‘national green house gas inventory’?*

Emissions from human activities are impacting the carbon cycle. Concentrations of CO<sub>2</sub>, methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) have increased to levels unprecedented in at least 800,000 years, and there is high confidence that current CO<sub>2</sub> concentrations have not been experienced for at least 2 million years. See the IPCC’s Sixth Assessment Report on the Physical Basis of Climate Change Technical Summary, T.S.2.2 pg 67 and Box TS.5 - The Carbon Cycle:

[https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_TS.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_TS.pdf)

See here for a further explanation about the carbon cycle <https://ugc.berkeley.edu/background-content/carbon-cycle/>. The New Zealand Agricultural Greenhouse Gas Research Centre provides further explanation on the science of methane, explaining what makes ruminant animals different to humans. See <https://www.nzagrc.org.nz/domestic/methane-research-programme/the-science-of-methane/>. The national greenhouse gas inventory reports on carbon dioxide emissions from human activities.

I must refuse your request for “the total percentage of CO<sub>2</sub> NOT used by all plants (and all humans) and included in your ‘national green house gas inventory’ under section 18(g) of the Act, as the Ministry does not hold this information and I have no grounds to believe that it is held by another department or organisation.

**Question 6:** *The IPCC Fourth Assessment Report was released September 2007. Some 15 years ago and I would suggest is now out of date. How has the MfE and CCC checked the modelling data in this report, to show that the conclusions are scientifically and factually correct? Please provide reference to the clauses that were scientifically fact checked and confirmed before recommendations were made to Government.*

The Intergovernmental Panel on Climate Change Fifth Assessment Report (AR5) released in 2013 provided revised global warming potentials (GWPs). However, under the current UNFCCC reporting guidelines on annual inventories, inventories will use GWPs from the IPCC Fourth Assessment Report.

When the UNFCCC updates national inventory guidelines to report in AR5, New Zealand's greenhouse gas inventory will update to being reported and published in AR5. New Zealand's reporting under the Paris Agreement, for example New Zealand's first Nationally Determined Contribution, already uses AR5 GWPs.

As stated above, the Ministry accepts the knowledge of the global scientific consensus on climate change summarised by the IPCC, and their process for review and correcting errors.

**Question 7:** *Please state the 308kt of methane as ppm or pp billion? Methane is at a concentration in the atmosphere of 0.016%. That is an average 1.88 ppm. What is the total biogenic methane level that was recorded in 2017, converted to parts per million. ie convert 33,518 kt to ppm.*

To answer this question would require the Ministry to create information. For the Official Information Act 1982 to apply, the information must be held by the agency concerned, and the Ministry is under no obligation to create new information.

**Question 8A:** *The science behind the warming effect of methane is not well accepted in recent literature. The IPCC reports are based on computer modelling so MfE and CCC must have had expert advice to check and confirm that methane has contributed 0.5°C. warming over a given period.*

a) *Please provide your evidence, as it relates to specific clauses in the IPCC report.*

The evidence for this comes from the IPCC's Sixth Assessment Report on the Physical Basis of Climate Change. Specifically, the section of the report where this was drawn from is the Summary for Policymakers, Figure SPM.2 | Assessed contributions to observed warming in 2010 – 2019 relative to 1850 – 1990, page 7.

This shows that methane has contributed an estimated 0.5°C to 2010 – 2019 warming, relative to 1850 – 1990. This assessment is from radiative forcing studies. The Summary for Policymakers is available here: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf)

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**Question 8B and C:**

- b) What percentage of methane contributed to the 0.5°C change, 2011-2020?
- c) Please confirm the 'major impact' of a 10% change in the concentration of methane. 10% of 0.0166% being just 0.00166% of all GHGs in the atmosphere.

I must refuse this part of your request under section 18(g) of the Act, as the Ministry does not hold this information and I have no grounds to believe that it is held by another department or organisation.

**Question 9:** *A new paper just published in a peer-reviewed literature has shown that the study the IPCC relied on made some math errors and also relied on obsolete data. 'In fact IPCC did not even use the updated data the IPCC itself used elsewhere in its report. Why has the CCC not checked these errors?' Mathematician Nic Lewis has noted that if the analysis were re-done dropping the 1860s, for which there are hardly any reliable temperature records, and using some recent IPCC estimates of the aerosol cooling effect, the ECS (Equilibrium Climate Sensitivity) best estimate fell even further, to 1.8 C. So the best estimate of ECS is below the level that the IPCC said it couldn't possibly be. Economists in the US have shown, if ECS is down around 2° C the whole basis for imposing costly climate policy falls apart. Please refer to the research paper "Climate sensitivity, agricultural productivity and the social cost of carbon in FUND" by Dayaratna, McKittrick and Michaels, January 2020. Further, it has been reported that the Institute of Physics, that publishes scientific journals, retracted 500 papers in September 2022 because of "suspicious and unethical activities". The Institute of Physics also retracted some 350 papers in February 2022. This suggests that the reports from the IPCC need to be checked with care. What checks have been completed by MfE and qualified economists, before giving advice to the CCC or Government?*

Reports produced by the IPCC are built on an extensive literature base, which ensures that there is a comprehensive assessment of the scientific, technological and socio-economic information to prepare a clear view of the current state of scientific knowledge relevant to climate change. A rigorous drafting and review process occurs for all IPCC content to guarantee a comprehensive report, objectivity and transparency. Expert Reviewers and governments are invited at different stages to comment on the scientific, technical and socio-economic assessment and the overall balance of the drafts. The review process includes wide participation, with hundreds of reviewers critiquing the accuracy and completeness of the scientific assessment contained in the drafts.

The IPCC has clear procedures for investigating, and if necessary, correcting alleged errors in its published reports. The process for informing, lodging, and correcting potential errors in the IPCC Sixth Assessment report on the Physical Basis is detailed here:

<https://www.ipcc.ch/report/ar6/wg1/about/errata/>. To download the errata identified and corrected for the IPCC Sixth Assessment report on the Physical Basis of Climate Change see: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Errata.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Errata.pdf)

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For more information on the IPCC review process, see:

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For more information on how the IPCC deals with alleged errors see:

[https://www.ipcc.ch/site/assets/uploads/2020/06/FS\\_ipcc\\_deals\\_errors\\_2020.pdf](https://www.ipcc.ch/site/assets/uploads/2020/06/FS_ipcc_deals_errors_2020.pdf)

**Question 10:** *What is the factual and economical based evidence to support the proposed ‘farm-level-split-gas levy’ proposed in this statement from the Primary Sector Climate Action Partnership? “The Waka Eke Noa is recommending the Government introduce a farm-level split-gas levy on agricultural emissions with built-in incentives to reduce emissions and sequester carbon.”*

Officials considered a range of approaches to effectively and feasibly implement agricultural emissions pricing from 2025. Economic modelling using farm-scale data was commissioned to support decisions on the preferred pricing option and carried out by Manaaki Whenua – Landcare Research (MWLR) in 2022. The modelling results indicate that the farm-level split-gas levy could achieve significant reductions, below the baseline scenario in 2030. At appropriate levy prices, this option is expected to more than achieve the targets, primarily through a combination of reduced production and stock numbers (especially on sheep and beef farms) and (to a lesser extent) uptake of mitigation technologies across all farm system types through the price signal and incentive payments.

If you would like to read further information on this response, please review the [Regulatory Impact Statement: Agricultural Emissions Pricing](#), 2022.

**Question 11:** *With reference to the paper by Coe et al. To quote Clause 5.2 from this paper; “5.2. Effect of Recently Increased Atmospheric CO<sub>2</sub> It is of some interest to calculate the increase in temperature that has occurred due to the increase in atmospheric CO<sub>2</sub> levels from the 280ppm prior at the start of the industrial revolution to the current 420ppm registered at the Mona Loa Observatory. (K. W. Thoning et. al. 2019) [17]. The HITRAN calculations show that atmospheric absorptivity has increased from 0.727 to 0.730 due to the increase of 140ppm CO<sub>2</sub>, resulting in a temperature increase of 0.24Kelvin. This is, therefore, the full extent of anthropogenic global warming to date.”*

*Please confirm that the CCC and MfE have, or will consider the Coe et al. paper and check your evidence as to the effects of methane and nitrous oxide on atmospheric infra-red absorption. What are the effects of methane and nitrous oxide on atmospheric infra-red absorption?*

The science of methane and nitrous oxide are well documented in the latest IPCC Sixth Assessment Report on the Physical Basis of Climate Change. This can be found here:

<https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>. More information on the effective radiative forcing of methane and nitrous oxide can be found in sections 7.3.2.2 and 7.3.2.3 of Chapter 7 of the IPCC Sixth Assessment Report on the Physical Basis of Climate Change. This can be found here:

[https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Chapter07.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07.pdf)

The Ministry accepts the knowledge of the global scientific consensus on climate change. The Coe et al. paper does not change the Ministry for the Environment's acceptance of the science of climate change, and the evidence that increasing levels of greenhouse gases, including carbon dioxide, methane, and nitrous oxide, contributes to increasing global temperatures.

### Review

You have the right to seek an investigation and review by the Office of the Ombudsman of my decision to withhold information relating to this request, in accordance with section 28(3) of the Act. The relevant details can be found on their website at: [www.ombudsman.parliament.nz](http://www.ombudsman.parliament.nz).

Please note that due to the public interest in our work the Ministry for the Environment publishes responses to requests for official information on our [OIA responses page](#) shortly after the response has been sent. If you have any queries about this, please feel free to contact our Ministerial Services team: [ministerials@mfe.govt.nz](mailto:ministerials@mfe.govt.nz).

Ngā mihi



Katherine Wilson

Director - Climate Adaptation and Evidence

**Ministry for the Environment | Manatū Mō Te Taiao**