

Call for evidence



We are calling for evidence on options available to reduce greenhouse gas emissions over the period 2022 to 2035.

Why are we doing this?

The Interim Climate Change Committee is the precursor to the proposed Climate Change Commission, expected to be established in late 2019 under the Zero Carbon Bill¹. The Bill provides a framework to help New Zealand deliver on the objectives of the Paris Agreement.

A key part of the proposed Commission's work will be to advise the Government on emissions budgets.

Emissions budgets set the total emissions of all greenhouse gases permitted in the relevant budget period. The Government will set emissions budgets based on the proposed Commission's advice.

Why are we doing this now?

We are running this call for evidence now as foundation work for the proposed Climate Change Commission to enable it to start work immediately as soon as it is set up.

It will help identify relevant information for developing these emissions budgets, and to maintain a broad, robust and transparent approach in developing the proposed Commission's evidence base.

We have been asked to do this through our [Terms of Reference](#). This work is also outlined in our letter to the Minister for Climate Change on 7 May 2019 [here](#).

What are we looking for?

We are looking for high-quality, credible, evidence that will support the proposed Commission's work on emissions budgets. This is likely to include knowledge and evidence of technologies and options to reduce emissions, and the economic, environmental, cultural and social impacts of them. We are not looking for personal views or opinions.

What if I have already made submissions on similar topics?

If you have already submitted evidence as part of consultation run by Government agencies, such as the Zero Carbon Bill or the Ministry of Transport's Clean Car Standard and Discount, then we are happy for you to point us to those submissions, noting the key information or material that relates to our call for evidence.

¹ Climate Change Response (Zero Carbon) Amendment Bill:
<http://www.legislation.govt.nz/bill/government/2019/0136/latest/LMS183736.html>.

What will we do with the evidence we gather?

We will use this information to inform our initial work on emissions budgets and add to the evidence base the proposed Commission will draw upon.

Confidentiality and data protection

All or part of any written response (including the names of respondents) may be published on our website www.iccc.mfe.govt.nz. Unless you clearly specify otherwise, we will consider that you have consented to both your name and response being published.

Please be aware that any responses may be captured by the Official Information Act 1982. Please advise us if you have any objection to the release of any information contained in your response, including commercially sensitive information, and in particular which part(s) you consider should be withheld, together with the reason(s) for withholding the information. We will take into account all such objections when responding to requests for copies of, and information on, responses to this document under the Official Information Act.

The Privacy Act 1993 applies certain principles about the collection, use and disclosure of information about individuals by various agencies, including the Interim Climate Change Committee. It governs access by individuals to information about themselves held by agencies. Any personal information you supply to the Committee in the course of making a response will be used by the Committee only in relation to the matters covered by this document. Please clearly indicate in your response if you do not wish your name to be included in any summary of responses that the Committee may publish.



Call for evidence: response form

We are looking for responses that are evidence-based, with data and references included where possible. Please limit your response to each question to a maximum of 400 words, plus links to supporting evidence, using the template provided. Please answer only those questions where you have particular expertise or experience.

We recommend that you refer to the Climate Change Response (Zero Carbon) Amendment Bill when considering your answers, which can be found [here](#).

If you have any questions about completing the call for evidence, please contact us via feedback@ICCC.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. We may follow up for more detail where appropriate.

Contact details

Name and/or organisation	Horticulture New Zealand
Postal Address	
Telephone number	
Email address	

Submissions on similar topics

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: HortNZ submissions on: <ul style="list-style-type: none">• Zero Carbon• Climate Change Response (Zero Carbon) Amendment Bill• Action on Agriculture discussion document

- Action for healthy waterways
- Proposed NPS Highly Productive Land

Commercially sensitive information

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.

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.

1. Change in funding/ finance to support transition of glass house growers to different heating systems

Glasshouse growing, provides an example of how the ETS rebates and contestable funding could be designed to be more effective. With a changing climate, glasshouse growing may become more important. Glasshouses provide a resilient growing system for some crops.

Glasshouse growers are already in the ETS and recognise the need to reduce emissions. The design of the industrial allocation is output based and incentivises low carbon production. However, crops are grown close to markets throughout NZ, including some places where low carbon fuels are not readily available.

The experience of glasshouse growers is of paying into the ETS, without seeing reinvestment that would enable a transition to lower emissions alternative fuels. For example, one grower spends \$500,000 per annum on the ETS units, of which 25% is returned by way of industrial allocation per annum. The ETS cost makes it more difficult for them to fund the investment required to transition to lower emissions alternative fuels.

Proven technology has recently become available from the northern hemisphere to install biomass burners that can heat glasshouses, but these systems would cost \$8-10m, which is cost prohibitive. However, potentially loans that enabled growers to invest their future free allocation may make the technology more affordable and would result in reduce emissions, rather than driving off-set through the ETS.

This grower recognises the need to save energy and has retrofitted 6 ha of energy screens at a cost of \$1m. Funding available from EECA is focused on new technology missing the easy wins, of enabling businesses to reduce energy output requirements. such as retrofitting screen installation. The funding criteria form EECA could be reviewed to ensure it supports uptake of existing technology.

2. Fuel Source for Biomass boilers – Change in regulation

The other big impediment to conversion, is a lack of infrastructure around fuel (biomass) supply. Forestry slash, of which there is an over-abundance, is a suitable base fuel source, but it not readily available. Recently a South Island grower has been trialling burning slash. However, this source still does not have a sufficiently reliable supply for growers to have confidence in investing in systems of capable of burning this fuel.

In our view regulation should be developed to encourage foresters to remove slash and provide it to users. This would facilitate the supply of this slash as a heating source in more reliable and affordable manner. Removing slash from the hillsides, would reduce both flood risks and emissions.

3. Market access – Market Access Regulatory and Resourcing Improvements

If significantly more land is converted to horticulture, particularly fruit-production, this produce will need access to viable export markets.

Unlike other products, our market access is not all guaranteed by having a free trade agreement and agreeing mutual recognition of food safety etc. For each individual plant product, importing countries require a lengthy and detailed pest risk assessment before agreeing to imports. This can take 3-10 years. Our export markets also expect New Zealand to process their produce import requests; currently MPI has about 250 requests and processes 2-3 per annum. The solution is several-fold: more MPI market access and technical staff for both export and import market access; a strong and committed presence in the international plant health arena (commitment by MPI to IPPC in particular); investment in innovation that enables and supports market access, particularly the reduction in pest/disease, and management of agrichemical residues.

4. *Research for lower emissions fertiliser*

Fertiliser is the main source of greenhouse gas emissions for horticulture. Reducing fertiliser use is a key focus of reducing water quality effects and greenhouse gas emissions.

The slow release fertiliser products produced by fertiliser companies are not necessarily well suited to meeting the needs of horticultural crops. More research is needed in this area for products that meets the demands of horticultural crops for human consumption.

5. *Regulation that support land use change to achieve water and greenhouse gas objectives*

The proposed intensification rules in the National Environmental Standard for Freshwater (NES-FW) include a proposal to require water quality discharge consents for any expansion of 10 ha or more of irrigation. This will capture new orchard expansions. On average orchards use a third of the water of irrigated pasture and have lower leaching concentrations², produce less greenhouse gas emissions³, and

² Gentile, R., Green, S., Mason, K., van den Dijssel, C., Johnstone, P., & Clothier, B. (2014). Land Management Practices and Nutrient Losses from Farms on the Poverty Bay Flats. Plant and Food (<http://www.hortnz.co.nz/assets/Uploads/Plant-and-Food-Land-management-practices-and-nutrient-losses-from-farm-.pdf>.)

³ BERG. (2018). The report of the biological emissions reference group. (<https://www.mpi.govt.nz/dmsdocument/32125/direct>)

have the highest revenue on per ha basis compared to any primary production land use⁴.

Capturing fruit and low impact horticultural production in the proposed NES-FW irrigation intensification rule is unlikely to result in improvements in water quality, and won't enhance the productive capacity of land or enable farmers to transition to lower emission productive uses. In our view this policy is inconsistent with the proposed National Policy Statement for Freshwater Management (NPSFM) and contrary to direction of the proposed National Policy Statement for Highly Productive Land (NPSHPL) and the Climate Change Response (Zero Carbon) Amendment Bill.

HortNZ in its submission, proposes that this rule excludes low impact horticulture systems. In most cases land use change to irrigated low impact horticulture would result in an improvement in water quality, and therefore this rule would add an unnecessary cost for no benefit. **Case Study One** below presents an example of Miro berry developments. These developments would likely result in water quality improvements compared to the existing use, as well as a range of economic, social and cultural benefits. However, this activity would be captured by this rule, adding an unnecessary cost and regulatory barrier.

Water quality

The discharge of nutrients is lower than most pastoral uses, and in most studies nutrient leaching rates are similar to or lesser than unirrigated sheep and beef farming. For example,

- A study of land on Poverty Bay estimated leaching rates for fruit and wine ranging from 5kg/ha to 18kg/ha, the same study estimated leaching from pasture at 19kg/ha (SPASMO)⁵.
- A study in the Hawkes Bay estimated leaching from fruit crops between 7kg/ha and 26kg/ha (Overseer 6.2.2).⁶

⁴ Ministry of Primary Industry. (September 2019). Situation and Outlook for Primary Industry.

⁵ Gentile, R., Green, S., Mason, K., van den Dijssel, C., Johnstone, P., & Clothier, B. (2014). Land Management Practices and Nutrient Losses from Farms on the Poverty Bay Flats. Plant and Food (<http://www.hortnz.co.nz/assets/Uploads/Plant-and-Food-Land-management-practices-and-nutrient-losses-from-farm-.pdf>.)

⁶ Ford, S. (2016). *Hawkes Bay Horticultural Nutrient and Financial Benchmarking Results*. (<http://hortnz.co.nz/assets/Natural-Resources-Documents/Hawkes-Bay-Horticultural-Nutrient-and-Financial-Benchmarking-Results-FINAL.pdf>)

- A study in Tasman estimated leaching from fruit and wine crops between 6 kg/ha and 36kg/ha (Overseer version 6.1)⁷
- The leaching rate for a large glass house, irrigating pasture with runoff water estimated a leaching rate of 20kg/ha⁸.
- A recently published Plant and Food report calculated nitrogen balances from a survey of asparagus growers in the Waikato, and found, using a simple N surplus, the average surplus was 11.4kg/ha⁹.

While irrigated horticulture has similar nutrient discharges to unirrigated sheep and beef, it has much lesser water quality impacts than unirrigated sheep and beef farming, because it discharges very low rates of bacteria and sediment, and lesser greenhouse gas emissions.

In some instances, where the existing land use is maize the water quality impact of nitrogen may be greater from conversion to an irrigated orchard. The conversion would likely still result in an improvement in bacteria and sediment discharges.

We are aware of proposed developments, where under-developed Māori land is being considered for low impact, high value horticulture. For example; the collectively owned Māori land between Opotiki and Te Kaha and Māori land on the Poverty Bay Flats, as described in **Case Study Two** below. The Turanga development is an example of an opportunity for Māori land owners to improve the returns from their highly productive land. The development would have social, economic and cultural benefits, with negligible water quality impacts. The proposed rule, may prevent some of this highly productive land realising its productive capacity.

Given the water quality effects of converting land from one very low intensity land use to another low intensity land use will be negligible at the Freshwater Management Unit (FMU) scale, and produce less greenhouse gases, we are of the view this provision within the proposed NESFW creates an unnecessary barrier and will exacerbate existing inequality in the allocation of natural resources, for negligible water quality benefit, and negative climate change impacts.

⁷ Ford S. , Nutrient Performance and Financial Analysis of Horticultural Systems in the Waimea Catchment, 2015 (<http://www.hortnz.co.nz/assets/Natural-Resources-Documents/Nutrient-Performance-and-Financial-Analysis-of-Horticultural-Systems-on-the-Waimea-Plains-Final-May-2015.pdf>)

⁸ Barber, A 2019 Pers comms 29 October

⁹ Hunt, A., Dellow, S., & Sinton, S. (2019). Evaluation of nitrogen mass balances for Waikato asparagus growers. Plant and Food. <https://www.waikatoregion.govt.nz/assets/WRC/Council/Policy-andPlans/HR/Block3/HortNZ-1-Michelle-Sands-Evidence.pdf>

Climate change

The measure of New Zealand's success in adapting our food production system in a way that contributes to global efforts to reduce global warming, will be to reduce the overall carbon intensity of New Zealand's food production, by changing, but not reducing our production.

Horticulture, and in particular fruit for export, presents an opportunity for current and future generations to produce more food in New Zealand with much lower emissions than animal agriculture.

As we transition to a low emissions economy, farmers need options to reduce their emissions. For some farms in some locations converting part of their farm to a low impact irrigated horticulture production, provides an opportunity to reduce emissions in a manner that supports the economic viability of the farm. In New Zealand there is 1,000,000 ha of land that could potentially be converted to horticulture. If this land was converted to horticulture it would be as effective at reducing New Zealand's agricultural emissions as a methane vaccine¹⁰.

The greenhouse gas and water quality targets are challenging for existing farmers. We acknowledge that the proposed NESFW is a transitional framework while water allocation policy is developed. However, the changes we make to farming systems in the next ten years will be critical in achieving the long-term climate and water quality outcomes. Farmers need options so they can respond to the challenges now. Where land use change is unlikely to result in adverse cumulative water quality effects and produces lesser greenhouse gas emissions, it should be encouraged, not constrained.

CASE STUDY ONE: Miro Blueberries

Background

Miro Limited Partnership (Miro) is an integrated, Māori owned and operated horticultural company owned by 28 Māori shareholders (ranging from individuals to iwi, hapu and land trusts). Miro's vision is to transform underutilized Māori land into high-value horticulture, providing skilled jobs and employment pathways for Māori people. This will also have wider benefits such as promoting regional growth (and the national economy) and building higher productivity and environmentally sustainable systems in New Zealand.

¹⁰ BERG. (2018). *The report of the biological emissions reference group.*
(<https://www.mpi.govt.nz/dmsdocument/32125/direct>)

Inputs for protected cropping of blueberries

Miro grows blueberries in a precision horticulture system, under poly tunnels, in fertigated 30 litre pots and substrate. On average there are 4500 plants per hectare.



Figure 1: Blueberry plants in a poly tunnel (Source: Miro)

Irrigation and feeding of the plants are done through an automated fertigation system via drippers directly into pots. Each plant is fed an average of 4L at peak season. The average run off out the bottom of the pots is 10% (range is 5-15%) depending on the season. This equates to 1800 litres per hectare per day at peak season. A good deal of this evaporates therefore run off in to soil is minimal (and some orchards have capture systems so there is no untreated run-off).

The berry variety Miro grows, has relatively low nitrogen demands, using far less nitrogen than vegetable crops grown in glasshouses, which are also low impact horticulture activities, and outdoor high value fruit crops.

Impacts of the NES-Freshwater on future development

Miro supports the principle of Te Mana o te Wai.

Miro have a pilot orchard in Te Teko comprising 6ha of production and a nursery (employing 65 local people) and have plans to scale this up and develop a further 22ha. Under the proposed NES-Freshwater provisions for irrigated farming, this expansion would require resource consent as a Discretionary Activity.

High value horticulture, such as blueberries, requires scale (10ha is seen as a minimum). As demonstrated in this example, limiting the scale of developments to 10ha could significantly limit the economic potential of Māori land and people. This is considered an unnecessary and inefficient regulatory barrier for what is a low impact horticultural activity (as with other glasshouse/covered crops and outdoor fruit and berry crops) in terms of having relatively low water quality impacts while also delivering significant positive benefits and being an environmentally sustainable land use that promotes the development of Māori land.

Unlike the bigger commercial growers these Māori entities do not have access to water or it is too expensive to access. In the future the NPSFM process may include a value assessment, that could provide water for Iwi/Marae, recognising the cultural value of development of Māori land, but this is quite different to Māori utilizing their primary asset (land) to generate economic and social returns for their people. In the next 10 years while the NES FW operates as a transitional set of regulations, the Miro developments, and any other Māori land owners transitioning to high value, environmentally sustainable horticultural crops at scale, would face increased regulatory barriers

CASE STUDY TWO: Turanga Proposed Kiwifruit Development

Background

In Turanga (Gisborne), a high percentage of high value Māori land is underutilised by Turanga Māori. Under the leadership of Te Aitanga a Mahaki Trust, interested Māori landowners in Turanga came together as under a project called “Turanga Whenua, Turanga Tangata” or “the lands and the people of Turanga”, 16 land blocks were identified as being capable of high value horticulture. Traditionally these areas have successfully grown food crops (such as citrus, avocados, feijoas and apples) as well as other crops such as maize, squash, and watermelons.

It is intended that over a 3 -year period cluster developments of kiwifruit, totalling 95.27 ha, will be established using a Joint Venture arrangement between Māori Landowners and investors which would include funding from Te Aitanga a Mahaki Trust (the Post Settlement Governance Entity) and Provincial Growth Fund (assuming the application is accepted).

The aim is to employ all local staff and to throughout the operation of the development and operation of the orchards train tangata whenua so that in time they can undertake the work themselves. This support the regional economy and enhances connection to the land.

Predicted losses from Kiwifruit

Kiwifruit has a predicted annual average Nitrate-Nitrogen (N) leaching loss rate of 9.9 kg/ha/y, compared with 18.9 kg/ha/yr for pasture low intensity sheep and beef with no irrigation¹¹. In the same study, maize cropping represented 30% of the Poverty Bay*

¹¹ Gentile, R., Green, S., Mason, K., van den Dijssel, C., Johnstone, P., & Clothier, B. (2014). Land Management Practices and Nutrient Losses from Farms on the Poverty Bay Flats. Plant and Food

flats and had predicted annual average N leaching loss rate of 6.6 kg/ha/y and was assumed not to be irrigated.

Impacts of the NES-Freshwater on future development

While some of this land may already have some irrigated production, there is some that might not be, for example land in maize. In this situation, these developments would require a discharge resource consent under the Irrigated Farming rules in the proposed NESFW, as a Discretionary Activity.

A condition of the consent required, is that 'the nitrogen, phosphorus, sediment, or microbial pathogen discharges of the farm that will result from the increased land used for irrigated production will not exceed the average discharges of those contaminants from the farm during the farm year 2017/2018'

In most circumstances a conversion of land to kiwifruit would be expected to result in reduced contaminant discharges. However, some of this land is cropping land, if this was in maize in the farm year 2017/2018 (which has a low N leaching rate) it would likely difficult to satisfy the Proposed NESFW criteria while maintaining a feasible operation. The proposed NESFW could prevent Turanga Māori from be unable to get a resource consent for using underutilised land, for what is a low intensity impact activity in regard to nutrient leaching, and a very low impact activity for sediment and bacteria and greenhouse gas emissions.

This case study demonstrates that the proposed rules in the NESFW, will have (what we believe to be) unintended consequences of limiting the potential of existing under-utilised land, particularly Māori land, to be used for a high-value horticultural use which if allowed would have negligible adverse and/or beneficial water quality impacts.

6. RMA reform to enable greenhouse gas emission to be considered

Currently decisions under the RMA can only consider climate change adaptation, not mitigation. When HortNZ discussed rules within Waikato Regional Council's Plan Change 1 with the Hearing Panel, the Commissioner, Trevor Robinson questioned HortNZ's evidence that the climate change benefits of providing a planning framework that would facilitate land use change to low impact horticulture (fruit) should be

<http://www.hortnz.co.nz/assets/Uploads/Plant-and-Food-Land-management-practices-and-nutrient-losses-from-farm-.pdf>.

*Note: The Kiwifruit study assumed 200kg/ha urea in September and 100 kg/ha Urea in October and no compost. This data was from a 2014 study, updated modelling is being done to that will support a new leaching figure (i.e. these leaching rates will may not align with current modelling).

considered as an additional benefit, stating that landuse change to fruit would reduce emissions and under the RMA, decision makers are only able to consider adaptation not mitigation.

Conversely, during discussions on our submission on the Zero Carbon Bill, HortNZ asked Hon James Shaw to consider food production, and setting targets to track not only emissions reductions, but also food production as a means of driving policy towards producing a greater proportion of lower emissions food, rather than just producing less food. Hon James Shaw explained that he considered the food production provisions within the Paris Agreement to be related to adaptation and not mitigation, and therefore should not be considered under the Zero Carbon Bill.

The IPCC Climate Change and Land report clearly indicates that food production is a part of the climate change problem and key part to the solution. In New Zealand, our current laws and regulations are not supporting joined-up decision making that enables policy to consider greenhouse gas and water quality outcomes together. In our view the reform of the RMA should enable decisions on water allocation, for example, to consider greenhouse gas emissions. Similarly, in our view the implementation of the Zero Carbon Bill through Free Allocation, should consider food production.

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.

1. Irrigation infrastructure

Irrigation of low impact horticulture is an efficient use of water. As well as having lesser or negligible water quality effects compared with other land uses, low impact horticulture crops use much less water, on average one third of the water of irrigated pasture¹², this is because of the efficient irrigation systems that can be used for static crops and the water demands of fruit.¹³ This means, that water can be transferred from pastoral irrigators to horticultural uses and irrigate a much larger area, producing much

¹² Gentile, R., Green, S., Mason, K., van den Dijssel, C., Johnstone, P., & Clothier, B. (2014). Land Management Practices and Nutrient Losses from Farms on the Poverty Bay Flats. Plant and Food (<http://www.hortnz.co.nz/assets/Uploads/Plant-and-Food-Land-management-practices-and-nutrient-losses-from-farm-.pdf>).

¹³ Ford, S. (2019). *Memorandum to HortNZ NESFW*.

more food for the same amount of water use. Low impact horticulture crops produce much more food than pastoral land uses on a per hectare, basis, for example 50t/ha of kiwifruit or citrus, 80T ha of apples¹⁴, or 500 tonnes per ha of glass house tomatoes¹⁵.

To facilitate the ongoing success of horticultural production, investment in water infrastructure need to be planned now, to enable crops to survive in the future climate and to manage the effects of irrigation on receiving environments.

2. Flood protection infrastructure

Many New Zealand floodplains are protected by extensive flood protection and land drainage schemes. With sea level rise and climate change, some of the rural schemes may become uneconomic. Other schemes, protecting urban areas and highly productive land may require considerably more investment.

The existing flood protection schemes have significant water quality and ecological impacts. Long term planning is required to determine how these schemes will operate into the future. This planning should be integrated with land use planning decisions that are being made as part of achieving greenhouse gas emissions and freshwater targets and outcomes.

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.

1. Increase in consumer demand for plant foods

HortNZ surveyed product groups to estimate the degree of expansion predicted over the next 10 years. The following crops were surveyed: avocado, blackcurrant, boysenberry, buttercup squash, citrus, feijoa, kiwifruit, kiwi berry, passionfruit, persimmon, pipfruit, tamarillo, potatoes, onion, process vegetables and fresh vegetables. The surveyed crops made up 100,000 ha of an estimated 120,000 – 130,000 ha of horticulture in New Zealand in 2018.

There was a predicted increase of 10,000 ha of additional fruit growing by 2028. Most growth is expected in avocado, pipfruit and kiwifruit for export. All of this would be irrigated and would be impacted by the proposed NES-FM rule, either by increased regulatory costs or in some cases prevented.

¹⁴ Refer to footnote 12 above

¹⁵ Barnes, H 2019, Pers comms 29 October

It is expected that the vegetables area may expand from 60,000 ha to 72,000 ha. This is both for population growth and for increased export of potatoes and onions. If the increased area of potatoes and onions is achieved, the proportion of vegetables grown for domestic supply would shift from 80% to 73%.

The expansion predicted by the horticulture industry is based on existing barriers and demand, and is much less than is potentially possible.

Fresh fruit and vegetables from New Zealand achieve a premium price internationally because our products are a high-quality and counter-seasonal. To maintain this premium New Zealand will need to be careful to maintain quality and reputation if the volume of product increases into established markets.

If there was an increase in demand for plant foods in NZ this would enable an expansion of the domestic vegetable supply. If there was an increased demand for premium fruit products this would export greater expansion of the NZ fruit exports.

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)?

1. Food production

The IPCC Climate change and land report recognizes that the global food system is under pressure from non-climate stressors (e.g., population and income growth, demand for animal-sourced products), and from climate change. These climate and non-climate stresses are impacting the four pillars of food security (availability, access, utilisation, and stability)¹⁶.

The contribution New Zealand makes to global food security, like our contribution to emissions, is relatively small. However, improving the global food system so it contributes more to the health of people, and less to climate change, requires global action.

¹⁶ IPCC. (2019). Climate Change and Land.

We believe the Climate Change Response (Zero Carbon) Amendment Bill, provides an opportunity for a national commitment to reduce the overall carbon intensity of New Zealand's food system, without reducing production. This could be achieved both by:

- reducing the carbon footprint of each food product; this metric could include on-farm carbon off-setting, but exclude off-farm offsetting, and
- increasing the proportion of food that has a lower carbon footprint relative to other food products New Zealand produces

It would be possible to achieve the greenhouse gas emission reduction target, by reducing the food New Zealand produces. However, in our view, the combination of climate and food targets, will direct New Zealand to making a more meaningful contribution to climate action, and is more likely achieve the aim of the Paris Agreement.

The Proposed NPS for Highly Productive Land, identifies land with high potential productive capacity. In our view food production should be prioritised on this land. This land should not be used for forestry.

In our view, there may need to be some limit on the sequestration that can be achieved by forestry to prevent New Zealand from achieving our emissions targets by reducing the food we produce which, if achieved, would be a hollow victory.

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?

If offshore mitigation meets robust criteria it may be useful. This is relevant in our view when considering the risks of carbon leakage, and in particular in the case where New Zealand does maintain and improve its ability to produce low emissions food. It may serve global climate and global food security better for New Zealand to offset some emissions with offshore mitigation, if it enables global emissions and food security objectives to be better met.

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.

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?

We support the He Waka Eke Noa work to provide farm level emissions reductions.

Question 7:

What cross-sector 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?

We think there is potential for New Zealand to market its food products as lower emissions, and for this market a fuller lifecycle assessment of carbon may be required, rather than farm-gate assessments produced through the He Waka Eke Noa process.

We have interest from New Zealand supermarkets and international supermarkets that are interested in marketing food in this way.

Carbon foot printing policy and standards would be useful

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?

The following policies are required:

- Stronger links between greenhouse gas emissions and RMA

- New Zealand Food Policy

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.

Question 9:

What evidence do you think the proposed Commission should draw upon to assess the impacts of emissions budgets?

1. New Zealand Food Security

In our view the impact of the costs of emissions from fertiliser for vegetable growers should be considered. In our view food security for New Zealand should be a factor in securing ongoing Free Allocation.

Over 80% of vegetables grown in New Zealand are for domestic consumption¹⁷. The vegetable export market is integrated with domestic vegetable growing, and is important for the economic sustainability of the domestic vegetable market.

When regulations treat all primary production the same, we risk allocating natural resources without considering the health consequences for our population.

The benefits of fruit and vegetable consumption are well established, particularly their role in preventing general micronutrient-deficiencies and chronic diseases¹⁸. Low fruit and vegetable intake are identified as a leading risk factor in loss of health. In New Zealand, having a high body mass index (i.e. being overweight or obese) has overtaken tobacco as a leading cause in health loss¹⁹. The Institute for Health Metrics and Evaluation (IHME) carry out the Global Burden of Disease study. This study attempts to quantify the health loss due to various diseases and risks. The study estimated that almost 800 deaths were caused by low vegetable intake in New Zealand in 2017, as well as quality of life lost due to morbidity²⁰.

¹⁷ Plant and Food. (2018). *Fresh Facts*.

¹⁸ Moore, D., Barton, B., & Young, M. (2019). The value of local vegetable production. *Sapere*.

¹⁹ Ministry of Health. (2013). Health loss in New Zealand survey 1990 - 2013.

²⁰ IHME. (2017). GBD Results Tool. Retrieved from Institute for Health Metrics and Evaluation: <http://ghdx.healthdata.org/gbd-results-tool>.

The price of meeting micronutrient requirements is very expensive in New Zealand compared to other countries. Without changing the land use the situation is unlikely to get better and could get worse²¹.

Affordability is a key factor in why people eat less than the recommended intake of fruit and vegetables. If fruit and vegetable growing cannot expand to meet the growing demand with an increased population, the reduced availability of vegetables and an increased price would impact on the health of the most vulnerable people²².

Higher food prices don't affect everyone equally; generally low-income households have a stronger response to changes in cost. Healthier food has been the first essential that low income families compromise in times of economic hardship, exacerbating existing nutritional deficiencies resulting from general lack of money²³.

In New Zealand, for families living in deprived areas, increases in fruit and vegetable prices especially around their off-season, compel them to substitute the purchase of healthier whole fruit and vegetables with cheap energy-dense and nutrient-poor products²⁴.

A 2019 Ministry of Health study has analysed household food insecurity among children in New Zealand²⁵, 174,000 (19%) children in NZ are estimated to live in food insecure households. When considering just the children in food insecure households, almost two-thirds lived in the two most deprived quintiles of neighbourhoods (Quintiles 4 and 5: 63.3%)²⁶.

There is an extensive body of research indicating that children experiencing household food insecurity have lower fruit and vegetable intake, diets higher in fat, and are at an increased risk of obesity²⁷.

Local vegetable production may provide a pseudo-subsidy through increased access to seasonal discounts and holding transports costs down. This would have long term public health benefits²⁸.

²¹ Moore, D., Barton, B., & Young, M. (2019). The value of local vegetable production. Sapere.

²² Refer above.

²³ Cheer, T., Kearns, R., & Murphy, L. (2002). . Housing policy, poverty, and culture: discounting decisions among Pacific peoples in Auckland, New Zealand. *New Zealand. Environ Plann C* , 497-516.

²⁴ Rush, E., Savila, F., Jalili-Moghaddam, S., & Amoah, I. (2018). Vegetables: New Zealand Children Are Not Eating Enough. *Front. Nutr.*

²⁵ Ministry of Health. (2019). Household food insecurity among children, New Zealand Health Survey.

²⁶ Ministry of Health. (2013). Health loss in New Zealand survey 1990 - 2013.

²⁷ Refer to footnote 26 above.

²⁸ Refer to footnote 22 above.

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.

1. Food Policy and New Zealand and Pacific Food Security

In New Zealand half of our green house gas emissions are related to food production. Food production is both the problem and the solution for climate change. In our view New Zealand, as a food producing nation needs to develop a Food Policy. Food Policy would to guide both food security for NZ and the Pacific and help to define our role as food producers for the rest of the world.

The definition of food security has experienced a substantial evolution over a period of decades, moving from a supply-focused concept, mostly related to food availability, to a multidimensional notion that also considers food accessibility, food utilisation and food stability.

One regularly cited definition of food security was defined at the World Food Summit in 1996 by the Food and Agriculture Organisation²⁹: *“Food security is achieved when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet dietary needs and food preferences for an active and healthy life”*.

New Zealand’s food policy has tended towards self-reliance, and exporting products we have a comparative advantage in and importing other products.

New Zealand has also been relatively self-sufficient for fresh vegetables and fruit, while importing mainly canned and frozen vegetables, and out of season fruit³⁰. Due to New Zealand’s isolation, we are unlikely to be able import sufficient fresh vegetables to replace locally grown vegetables, if due to urban growth or water policy, fresh vegetables growing cannot expand to meet the demand of New Zealanders in the future.

A movement towards increased food self-sufficiency could be beneficial for New Zealand’s food security, given the potential impacts that increased food prices could have on disadvantaged parts of society. Increased domestic production of horticulture, particularly in a variety of different crops, could improve the nation’s ability to feed itself and make it less dependent on imports. The countries we import fruit and vegetables from are at much greater risk of food insecurity due to climate change than New

²⁹ FAO. (2016). Rome Declaration on World Security.

³⁰ Plant and Food. (2018). Fresh Facts.

Zealand is. If New Zealand was more self-sufficient for food supply, we would also be less susceptible to a single crop failure from disease or biosecurity incursion³¹.

Increased domestic horticultural production could also support New Zealand's ability to be food self-reliant. If New Zealand is able to increase the quantity and quality of crops in which it has a comparative advantage (such as kiwifruit or apples), then this could drive higher income from exports. This would enable an increased variety of foods to be imported that can serve the country's food security agenda.

While the objectives of increased food self-sufficiency and food self-reliance may seem in opposition to each other, this would only be the case if the domestic production sector remained static. A more diverse and productive domestic food sector would likely help serve both goals and improve the overall level of food security in New Zealand. To achieve these goals, domestic production must be strategic and informed, responding to consumer trends internationally, as well as the stability and accessibility of food for New Zealanders.

In our view, New Zealand should develop a food policy. New Zealand's food policy would need to consider food security, climate change, the impacts of food production on ecosystem health and natural resources, and the importance of sustainability to New Zealand's international food brand.

³¹ McWha, Li, & Moore, 2019

Section D Other considerations, evidence or experience

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 by **12 noon, Friday 15 November 2019**.

If you have any questions about completing the call for evidence, please contact us via feedback@ICCC.mfe.govt.nz.