

SUBMISSION ON

2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan

20 June 2023

To: Climate Change Commission

Name of Submitter: Horticulture New Zealand

Supported by: Citrus NZ, Potatoes NZ

Contact for Service:

Emily Levenson

Environmental Policy Advisor

Horticulture New Zealand

PO Box 10-232 WELLINGTON

Ph: 027 305 4423

Email: Emily.levenson@hortnz.co.nz

OVERVIEW

Submission structure

- 1 Part 1: HortNZ's Role
- 2 Part 2: Executive Summary
Key policy outcomes sought
- 3 Part 3: Submission
A general discussion of emissions reduction and horticulture
- 4 Part 4: Discussion Questions
Responses to the consultation's specific questions
- 5 Part 5: Recommendations
HortNZ's response to the 19 recommendations in the Draft Advice.

Our submission

Horticulture New Zealand (HortNZ) thanks the Climate Change Commission for the opportunity to submit on the *Draft advice to inform the strategic direction of the Government's second emissions reduction plan* and welcomes any opportunity to continue to work with the Climate Change Commission and to discuss our submission.

The details of HortNZ's submission and decisions we are seeking are set out in our submission below.

Note: Throughout this submission, the Climate Change Commission will be referred to as the CCC or the Commission. The *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan* will be referred to as the Draft Advice.

HortNZ's Role

Background to HortNZ

HortNZ represents the interests of approximately 5,500 commercial fruit and vegetable growers in New Zealand who grow around 100 different fruit, and vegetables. The horticultural sector provides over 40,000 jobs.

There is approximately, 80,000 hectares of land in New Zealand producing fruit and vegetables for domestic consumers and supplying our global trading partners with high quality food.

It is not just the direct economic benefits associated with horticultural production that are important. Horticulture production provides a platform for long term prosperity for communities, supports the growth of knowledge-intensive agri-tech and suppliers along the supply chain; and plays a key role in helping to achieve New Zealand's climate change objectives.

The horticulture sector plays an important role in food security for New Zealanders. Over 80% of vegetables grown are for the domestic market and many varieties of fruits are grown to serve the domestic market.

HortNZ's purpose is to create an enduring environment where growers prosper. This is done through enabling, promoting and advocating for growers in New Zealand.



Executive Summary

How to grow low emissions food production

This submission focuses on two topics:

1. Policy levers to enable horticultural expansion as a strategy for low emissions food production and;
2. Resources needed for horticulture to further decarbonise.

The Climate Change Commission identifies expanding horticulture as one step on the pathway to reduce New Zealand's greenhouse gas emissions, but they identify barriers including lack of infrastructure, markets, water access, and labour (p. 39, 92). The government can address these challenges with the following policy levers, which are discussed in greater detail in the submission below.

Policy levers to enable horticultural expansion

NATIONAL PLANNING AND POLICY DIRECTION

- Develop a National Food Strategy, that includes consideration of the importance of New Zealand in supporting food security in the Pacific.
- Provide for food in the National Planning Framework, and national policy statements should work in concert minimise duplication or contradiction.
- Trust existing industry assurance programmes for climate action accountability, Freshwater Farm Planning and Integrated Farm Planning.
- Make food security an explicit consideration in climate policy assistance, including investment, industrial allocation and research funding.

CLIMATE ADAPTATION

- Maintain and upgrade flood protection infrastructure for our food supply.
- Develop expedient disaster relief plans for extreme weather events that account for the time-sensitive nature of horticultural recovery.
- Protect horticulture from pest incursions by better resourcing biosecurity at all border entry points.

LACK OF INFRASTRUCTURE

- Maintain and upgrade rural road networks to enable horticulture.

MARKETS

- Enforce a mandatory Grocery Code of Conduct to ensure fair trade practices for horticulture in the domestic market.
- Direct MFAT to promote true low emissions food in international trade agreements.

ACCESS TO WATER

- Develop policy settings that support expansion of and investment in water storage.
- Ensure water consent timeframes give growers the certainty to invest and increase production while improving environmental outcomes.
- Account for the emissions implications of an activity in water allocation decisions.

SKILLS AND LABOUR

- Make labour policy decisions through the lens of a just transition and enabling low emissions land use.
- Ensure sustainability of the Recognised Seasonal Employer (RSE) scheme for both the Pacific and the horticultural industry, given how invaluable that skilled workforce is for growers.
- Ensure Working Holiday visa schemes are competitive with a low entry fee to encourage backpackers.
- Invest in vocational training schemes which reflect horticulture's complexity and grow a much larger base of people with the skills to drive the industry forward.
- Co-fund innovative skills training projects like the Pukekohe-based Vegetable Industry Centre of Excellence (VICE).
- Co-fund industry-led training and advisory services to help those seeking to transition to horticulture and to embed climate-friendly practices within the industry.

RESEARCH AND DEVELOPMENT

- Direct more research funding toward existing low emissions industry.
- Invest in horticultural automation through depreciation relief.
- Invest in innovation to develop new cropping systems and varieties that are more resilient to climate change.
- Research adaptation and recovery after flooding and extreme weather events and transitioning to horticulture as a low emissions land use activity.
- Research significant knowledge gap in balancing crop yield and nutrient losses to the environment from compost versus synthetic fertiliser use.

- Speed up regulatory approval of new sustainable crop protection products, particularly when these produces are already approved for use in export markets.
- Mandate the EPA to work with the horticulture sector to clarify the balance between environmental and economic benefit. We also seek that the EPA co-design studies with industry to determine the costs and benefits as well as the loss of food production when existing productive chemicals are removed from use.

Policy levers to support horticultural decarbonisation

COVERED CROPPING

- Establish grants and low interest loans for covered cropping decarbonisation for small to medium growers to overcome debilitating transition costs.
- Upgrade electricity infrastructure for renewable covered cropping businesses.
- Fund mapping for ground source heat.

TRANSPORTATION AND SHIPPING

- Establish green shipping corridors and invest in low or zero-emissions fuels for maritime transportation.
- Fast-track port upgrades to allow for larger, low or zero-emissions shipping vessels.
- Maintain and upgrade rural electrical infrastructure to support additional load.
- Fund EV charging infrastructure in rural areas.

METHANE

- Develop a methane reduction itemised budget and implementation plan for Government spending.
- Develop a carbon lifecycle assessment of commercial compost versus synthetic fertiliser emissions.

Submission

This section covers general comments about the Draft Advice as a whole. Specific commentary on discussion questions and the 19 CCC recommendations can be found in the following sections.

1. Horticulture and Climate Policy

Horticulture has a role to play in New Zealand's transition to a low emissions economy and in meeting our 2050 targets. We welcome the opportunity to feed into the development of the Emissions Reduction Plan (ERP).

Horticulture New Zealand (HortNZ) engaged in previous consultation on the ERP, making detailed submissions on the Climate Change Commission's (CCC) Advice to Government, the discussion document preceding the First Emissions Reduction Plan, and participating in He Waka Eke Noa.

2. Climate Change, Food Security, and Human Health

HortNZ sees food security and reducing emissions as a dual focus for climate action, where these two priorities are held equally without one compromising the other. The cover decision for COP 27 was the first ever to mention food, recognising "the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change."¹ This put food at the top of the global environmental agenda, and it should also be a priority for New Zealand. Food is simultaneously a necessity for human survival, a possible casualty of climate change, and a sector that can be leveraged to reduce greenhouse gas emissions. The New Zealand government should work toward emissions reduction through land use change for health and climate impacts.

2.1. Food Security and Human Health

Zero hunger is the second United Nations sustainable development goal, and good health and well-being is the third.² There is a strong link between climate action and human health particularly regarding food security and hunger.

Improving food security requires sustainable local market and regulatory conditions to feed the population. Changes in environmental regulations and extreme weather events may also lead to increases in the cost of food in New Zealand.

Outcomes sought:

¹ Sharm el-Sheikh Implementation Plan. 2022. Accessed 21/04/23 [COP27 AUV 2 \(unfccc.int\)](https://unfccc.int/COP27_AUV_2) (p. 1)

² [THE 17 GOALS | Sustainable Development \(un.org\)](https://un.org/sustainabledevelopment/the-17-goals)

- Develop a National Food Strategy, that includes consideration of the importance of New Zealand in supporting food security in the Pacific.
- Make food security an explicit consideration in climate policy assistance, including investment, industrial allocation and research funding.

2.2. Adaptation for Food System Resilience

New Zealand needs to recognise the risk climate change poses to food security and focus on sustaining a productive food system through a changing climate.

There is a need for adaptation to protect and enhance global food supply. The IPCC *Special Report on Climate Change and Land* asserts that, "Observed climate change is already affecting food security through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events ... Food security will be increasingly affected by projected future climate change."³

In New Zealand, we have a national food production system that relies on growing vegetables and fruit in pockets of highly productive land with a suitable climate and access to freshwater. We must protect these resources from flooding and extreme weather to preserve our food supply. HortNZ requests further investment in building flood protection infrastructure and supports managed retreat from flood-prone areas.

When adverse events do occur, recovery efforts should be quick and targeted such that economic and social losses are not compounded.

Outcomes sought:

- Maintain and upgrade flood protection infrastructure for our food supply.
- Develop expedient disaster relief plans for extreme weather events that account for the time-sensitive nature of horticultural recovery.

2.2.1. RISK ACCOUNTING

The Government and industry alike need to properly account for the risk of extreme weather and flooding events heightened by climate change. For instance, it may be expensive to maintain flood protection infrastructure now but spending that money upfront will save even more money in disaster recovery later. Governments should be calculating the real costs of delaying maintenance of flood protection given climate projections as part of their infrastructure planning and budgeting processes. This is particularly relevant in New Zealand in the wake of Cyclone Gabrielle.

2.3. Reducing Emissions Through Plant-Based Diets

Research from the University of Otago has illustrated the connection between eating patterns, climate change and health outcomes. Eating more plant-based foods and minimising household food waste are some of the most important ways individuals could reduce their personal climate footprint, with the co-benefits of health gains and health

³ [Special Report on Climate Change and Land – IPCC site](#)

system savings.⁴ This research reported annual diet-related emissions reductions between 4% (following New Zealand Dietary Guidelines) and 42% (waste free vegan diet). This second number is equivalent to one-fifth of the current emissions reduction needed to meet New Zealand's commitment under the Paris Climate Agreement. Plant based balanced diets are also recognised as key mitigation strategy in the IPCC 6th Assessment Report.⁵

Agriculture contributes about 48% of New Zealand's greenhouse gas emissions⁶ and Oceania has the highest per capita agricultural emissions of any continent (6.5 t CO₂e per capita).⁷ Given the predominance of food production to our national and regional emissions, New Zealand has a vested interest in acquiring agricultural technology and best practices to reduce our contributions. In 2021, food made up 65% of New Zealand's merchandise exports.⁸ As climate change threatens worsening world hunger⁹, and New Zealand produces enough food to feed over 40 million people¹⁰, our focus should be on learning how to reduce emissions from food production rather than reduce the presence of the sector. This is in line with the UNFCCC Global Mitigation Work Programme for 2023, which calls for "Promoting sustainable development and understanding socioeconomic effects."¹¹ That means enabling sustainable growth of food production to both bolster the economy and provide for global nutrition and wellbeing.

80% of global emissions from cultivation come from beef, dairy, and rice, and these are some of the most financially supported food products in the globe¹². We should be working on other ways to provide the same nutrients to people without sacrificing atmospheric warming. Making these food production systems more efficient will not make nearly as much of a difference as becoming less reliant on them in the first place. We need a global shift toward less emissions-intensive diets, which means turning to plants more often for our proteins and nutrients.

3. Enabling Land Use Change to Horticulture

Diversification to horticulture presents an opportunity to reduce emissions while increasing food production. In New Zealand, there are 1,000,000 ha of land that could potentially be converted to horticulture to meet increased demand for plant-based foods. If this land was

⁴ Drew, J et al. (2020) 'Healthy and Climate-Friendly Eating Patterns in the New Zealand Context'. Environmental Health Perspectives <https://ehp.niehs.nih.gov/doi/full/10.1289/EHP5996>

⁵ <https://www.ipcc.ch/report/ar6/wg2/>

⁶ [New Zealand's emissions profile in 2019 | Ministry for the Environment](#)

⁷ FAO. 2022. Greenhouse gas emissions from agri-food systems - Global, regional and country trends, 2000-2020. FAOSTAT Analytical Brief No. 50. Rome. Accessed 20/04/23 [Greenhouse gas emissions from agrifood systems \(fao.org\)](#) (p. 2)

⁸ [World Development Indicators | DataBank \(worldbank.org\)](#)

⁹ AO, IFAD, UNICEF, WFP and WHO. 2022. The State of Food Security and Nutrition in the World 2022. Repurposing food and agricultural policies to make healthy diets more affordable. Rome, FAO. Accessed 21/04/23 <https://doi.org/10.4060/cc0639en> (p. 16)

¹⁰ Rush, E., Obolonkin, V. Food exports and imports of New Zealand in relation to the food-based dietary guidelines. Eur J Clin Nutr 74, 307-313 (2020). <https://doi.org/10.1038/s41430-019-0557-z>

¹¹ <https://unfccc.int/topics/mitigation/workstreams/mitigation-work-programme#Topics-for-2023>

¹² H. Galt, et al., "Shifting Finance Towards Sustainable Land Use: Aligning Public Incentives with the Goals of the Paris Agreement," (2021). Accessed 21/04/23 <https://climatefocus.com/wp-content/uploads/2022/06/ShiftingFinanceMainReport.pdf> (p. 34)

converted to horticulture, it would be as effective at reducing New Zealand’s agricultural emissions as a methane vaccine.¹³

4. Industry Assurance

New Zealand produces low emissions foods for New Zealanders and export markets. Assurance frameworks are important in ensuring robust reporting and certainty around emissions reduction actions. Industry assurance programmes such as New Zealand Good Agricultural Practice (NZGAP) provide a trusted system for integrated reporting to meet regulatory requirements and provide peace of mind for consumers.

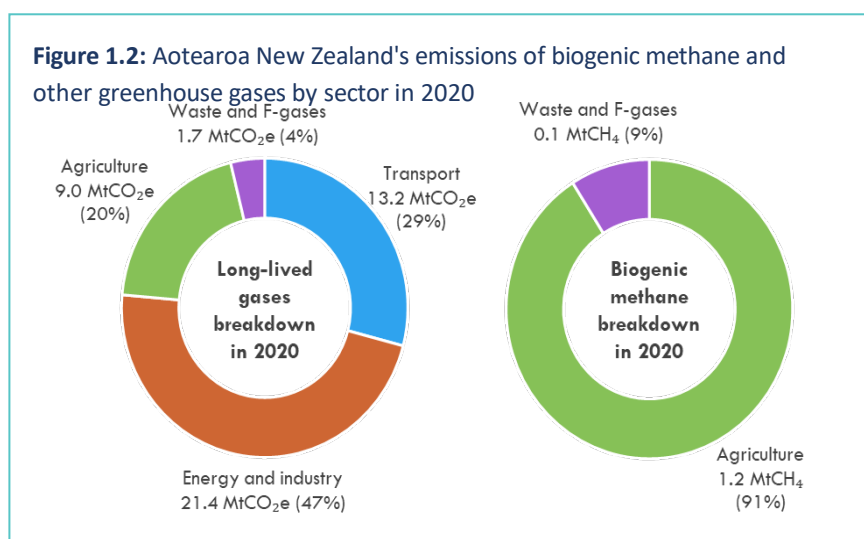
Outcomes sought:

- Trust existing industry assurance programmes for climate action accountability, Freshwater Farm Planning and Integrated Farm Planning.

5. Methane Accounting

HortNZ is concerned that the methane calculations in the Draft Advice do not add up and shift responsibility away the biggest emitter – pastoral farming.

Methane emissions from pastoral farming are inherent to the digestive processes of ruminant animals. Unlike organic waste in landfills, which can be captured and controlled, reducing methane emissions from livestock involves complex factors such as animal diet, management practices, and breeding programs. Addressing methane emissions in pastoral farming requires a comprehensive approach that encompasses animal nutrition, herd management, and other mitigation strategies. Given this complexity and the fact that methane is inherent to raising ruminant animals, the focus on organic waste seems like a distraction to avoid the challenging task of hold the meat and dairy industries accountable.



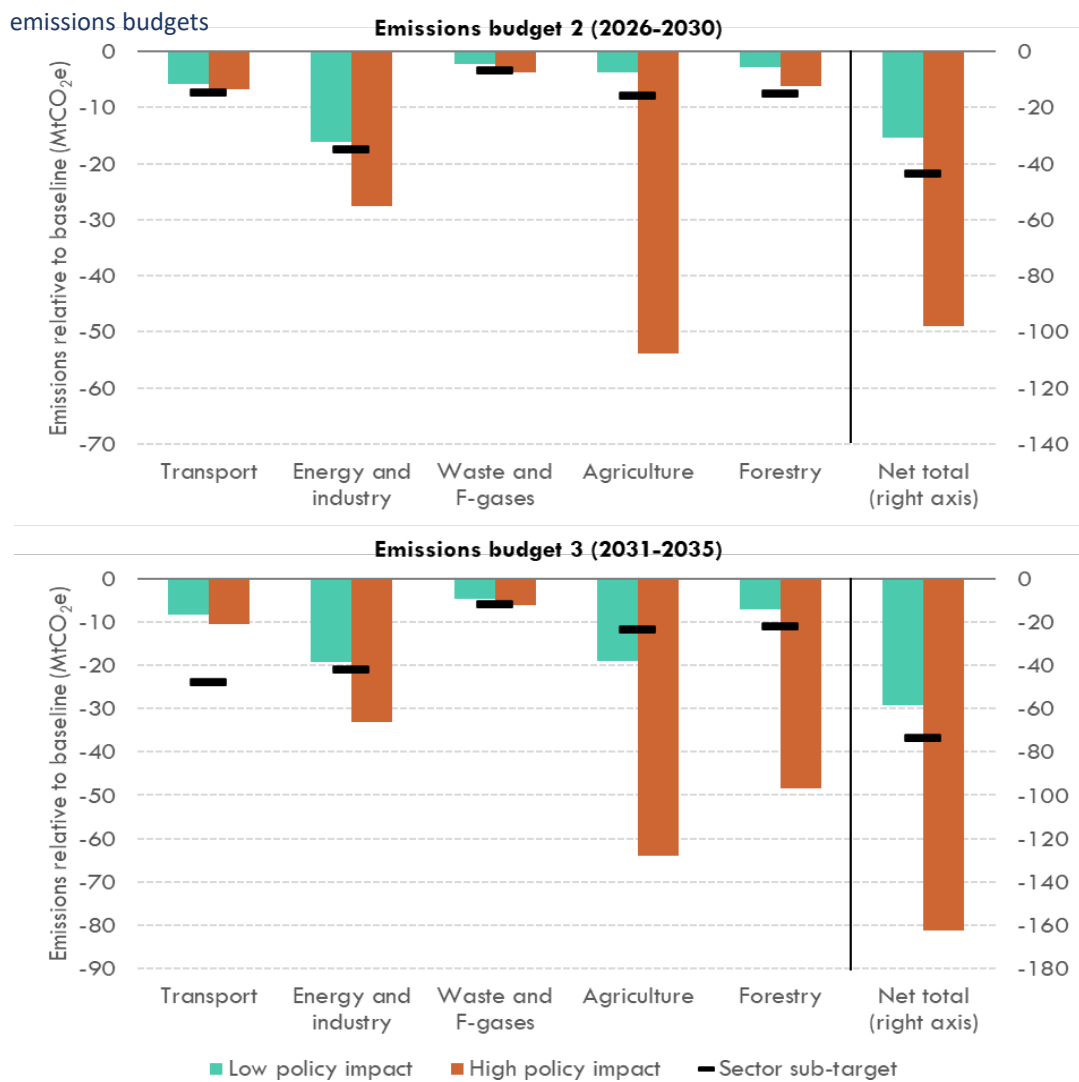
Source: Commission analysis of the 2022 GHG inventory²

Note: CO₂e emissions expressed using GWP100 values from the IPCC’s Fourth Assessment Report (AR4)

¹³ Dorner, Z et al. (2018) Land-use Change as a Mitigation Option for Climate Change. Report to the Biological Emissions Reference Group (Project No. 18398) <https://www.mpi.govt.nz/dmsdocument/32140/direct> Accessed 24/04/23. (p. 12)

Figures 1.2 (above) and 2.4 (below) from the Draft Advice show that the gains to be made from F-gases, which don't even release biogenic methane, and waste are tiny compared to those that are possible with a high policy impact on agriculture. The high impact is dependent on new technologies like a methane inhibitor (p. 41). While this is an exciting possibility, it is not a certainty. Agriculture is a high emissions land use, and we cannot rely on wishing for a technology saviour when there are existing ways to reduce emissions from food production through land use diversification.

Figure 2.4: Government estimates of the impact of policies in the first emissions reduction plan towards meeting the second (top panel) and third (bottom panel) emissions budgets



Source: Commission analysis of data published with *Aotearoa New Zealand's first emissions reduction plan*¹⁰

Notes:

1. The ERP data presents multiple ranges for forestry. The range shown is based on Table 14.1 in the ERP.
2. The required emissions reduction for energy and industry assumes the aluminium smelter continues to operate.
3. We have combined the Waste and F-gases sector sub-targets in this figure.

6. Additional Evidence or Reference Materials

Below is a list of additional reference materials in response to the consultation question, “Is there additional evidence or reference material that you think the Commission should consider as we generate the final advice we provide to government?”

- Diffusion of Innovations (DOI) Theory for policy design
- Futures-based scenarios for horticulture under differing policy regimes: The Aotearoa Circle. (2022). *Agricultural Sector Climate Change Scenarios*.
- The new Data Supermarket project from Our Land and Water brings together information about crops, climate, and economics that will be helpful for determining where horticulture could thrive under future climate scenarios.¹⁴
- Examples of climate innovators:
 - Forest Lodge Orchard: zero emissions horticultural operation¹⁵
 - H.W. Richardson: hydrogen-diesel trucking¹⁶

¹⁴ Our Land and Water. “Data Supermarket”. Accessed online 31/05/23.
<https://ourlandandwater.nz/outputs/data-supermarket/>

¹⁵ <https://www.forestlodge.nz/>

¹⁶ H.W. Richardson. “Driving Change. Driving Hydrogen.” Accessed online 12/06/23.
<https://www.hwr.co.nz/hydrogen>

Discussion Questions

The consultation asked over 70 questions. We have answered those that are most relevant and consolidated our responses to specific recommendations in the table at the end of this submission.

Chapter 2: The Task for the Second Emissions Budget

Q. 14 Have we missed any important information regarding the task for the second emissions budget?

In the demonstration pathway, the benchmark for action presents a 14,000-ha increase in horticulture from 2020 to 2030. The advice should go further and provide policy recommendations for Government actions to facilitate that transition. We elaborate on this further in response to Chapter 7: Agriculture.

Chapter 3: A Path to Net Zero

Q. 15 Do you agree that gross emissions reductions are required to achieve and sustain net zero emissions? Why or why not?

FULLY AGREE

In the Draft Advice, the Commission describes gross emissions reductions as “reducing at the source the volume of emissions being produced” (p. 46). This contrasts with offsets, which rely on carbon sinks like forests to capture greenhouse gas emissions equivalent to those expended elsewhere.

HortNZ agrees that to ensure long-term sustainability, it is imperative to focus on reducing emissions at their source. Gross emissions reductions target the activities and sectors responsible for greenhouse gas emissions. The biggest emitters should be both held accountable for their environmental impact and supported in transitioning to better practices. This approach fosters accountability and encourages proactive action across industries to transition towards more sustainable practices. Nationwide focus on gross reductions will lead to better resourcing for businesses with neither the scope for internal offsetting nor the finances for external offsetting.

Pursuing gross emissions reductions fosters innovation, drives technological advancements, and incentivizes efficiency improvements. By setting clear emissions reduction targets separate from offsets, industries are motivated to develop and adopt cleaner technologies, practices, and processes.

Offsets themselves can have negative externalities that impact biodiversity and climate resilience. Our submission goes into more detail about the negative impacts of monoculture plantation forestry in Chapter 10: Forests.

Q. 16 Do you agree with our assessment of the risks and implications of carbon removals in meeting and maintaining net zero emissions?

FULLY AGREE

Our submission goes into more detail about the negative impacts of monoculture plantation forestry in Chapter 10: Forests.

Regarding forests as carbon removals, HortNZ shares the Commission's concern over forest fires and damage from extreme weather events like Cyclone Gabrielle quickly reversing carbon storage in forests (p. 47). Point-source reductions in emissions are a more reliable path toward our climate goals with fewer risks to human health and wellbeing.

Q. 19 Are there any other issues related to how setting a path to 2050 influences actions in the second emissions budget period that you think should be included in our advice?

No specific comments.

Chapter 4: Emissions Pricing

Q. 21 Do you agree that the NZ ETS should play an important role in driving decarbonisation?

FULLY AGREE

Yes, we need to incentivise decarbonisation, rather than hiding our emissions in offsetting.

We also agree that the Government needs to design the NZ ETS for desired outcomes and then "let the market decide" strategies for delivering outcomes (p. 53). HortNZ believes the ETS should be treated as a free market without price controls that distort its purpose - to incentivise decarbonisation.

While HortNZ agrees that the Government should "identify transition pathways" for industries receiving Free Industrial Allocations (Free IA), Free IA remain an existing mechanism to manage carbon leakage, and price controls will disadvantage those who receive free allocations by deflating their value. Our emissions-intensive, trade-exposed (EITE) growers use the Free IA to genuinely offset the costs of their activities.

This winter, Australian tomatoes are being imported and undercutting the price of domestically grown crop. If the Free IA is not amended to address this scenario, New Zealand growers will need to reduce sales prices to compete, leaving less cash on hand

to transition to more sustainable glasshouse heating options. Free IA should be used for their intended purpose, to reduce trade risk. Our submission covers the challenges for covered crop decarbonisation further under Chapter 9: Energy and Industry.

Q. 22 Do you agree with our assessment that the current NZ ETS structure creates a high risk that afforestation will displace gross emissions reductions?

FULLY AGREE

Yes, we've already seen this happen with mass plantation forestry. Our submission goes into more detail about the negative impacts of monoculture plantation forestry in Chapter 10: Forests.

Q. 25 Are there other aspects of the NZ ETS or emissions pricing that you think should be covered in our advice?

HortNZ support 'recycling' of NZ ETS proceeds into climate change mitigation and adaptation; but seek to amend the funding criteria to include consideration of the benefits to food security and to ensure that the funding is available to a range of business sizes.

Chapter 5: Whāia Ngā Tapuwae

Q. 27 Do you support the overall advice in this chapter? Why or why not?

HortNZ is supportive of active engagement with Treaty partnership and believe Māori should be integral partners in developing New Zealand's climate change policy. The Government must engage in early and continued communication and collaboration with iwi/Māori partners. HortNZ also supports improved Māori access to capital for investment into horticulture as a low emissions land use.¹⁷

27.1 Food Sovereignty

HortNZ supports the progression of food security and food sovereignty strategies, which are highlighted as priority initiatives for iwi/Māori, and the Government can be a partner in taking a wider food systems approach to wellbeing (p. 73). Māori gardening has had a "strong cooperative component" for centuries,¹⁸ and gardening efforts have been "as much about social needs, hospitality, obligations, and aspirations" as they are about health and physical wellbeing.¹⁹ Food cultivation nourishes our bodies but also our cultural ties and relationships with others. Truly integrated food planning requires a reconciliation in the eyes of policymakers between the image of horticulture as an industry

¹⁷ Growing Together 2035: Aotearoa Horticulture Action Plan - Strategy. February 2023.

¹⁸ Furey, Louise. *Māori gardening: An archaeological perspective*, October 2006. Department of Conservation, pg. 120.

¹⁹ Furey, Louise. *Māori gardening: An archaeological perspective*, October 2006. Department of Conservation, pg. 9.

and as a connecting force between people and communities. When you enable the industry, you enable the wellbeing that comes along with growing and sharing food.

27.2 Integrated Management

We believe that clearing regulatory barriers to land use change to horticulture and developing national planning direction that prioritises food production will support food sovereignty. For instance, New Zealand Good Agricultural Practice (NZGAP) and tangata huawhenua have developed a joint proposal for Bridging the Gaps, a programme for integrated farm planning and assurance that enables Māori agribusinesses to face the market and regulator to demonstrate compliance and excellence, in a flexible manner that supports individual businesses and collective outcomes.

The current farm planning and assurances approaches are limiting for Māori because they can lead to the fragmentation of Māori agribusiness environmental management and undermine mana motuhake, by creating barriers to Māori agribusiness to manage their activities in an integrated way.

NZGAP will work with Māori agribusinesses and collectives to trial integrated farm planning at a range of scales for relevant scopes. For example, crop management and certification at the product level, Social Practice and Freshwater management at the business level, and greenhouse gas emissions management at the collective level. HortNZ supports tailored support and planning frameworks to enable the success of Māori agribusinesses under New Zealand's shifting environmental planning regime.

27.3 Future of Māori Horticulture

Māori have significant investment in horticulture, and the promotion of horticulture as a low emissions food production sector will support their success. We don't know what new food production techniques will be developed or adapted in the future, and permissive planning regulations will enable the ability to grow in the future. Māori are well positioned to be leaders in regenerative agriculture and other developing spaces. That work will only be possible if there is flexibility in land use.

There's also great potential to develop indigenous varieties of food crops which are well suited to local environments. The Global Alliance for the Future of Food writes that in agriculture,

Production has moved away from native and indigenous varieties toward a narrower scope of products, in the process eroding the extensive and sophisticated local agricultural knowledge once present and weakening food systems resilience against climate change and other crises as dependence on just a few commodities has increased.²⁰

Reversing this trend away from indigenous crop varieties requires more targeted funding and science support for indigenous food research and implementation. It is also critical to

²⁰ Global Alliance for the Future of Food. *Untapped Opportunities: Climate Financing for Food Systems Transformation*. n.p.: Global Alliance for the Future of Food, 2022. Accessed 21/04/23 [climatefinancereport-english.pdf\(futureoffood.org\)](https://climatefinancereport-english.pdf(futureoffood.org)) (p. 15)

protect unique indigenous horticulture of taonga species through assessing their climate resilience and establishing protocols for the use of Māori data in horticultural research.²¹

Chapter 6: Maintaining and enhancing wellbeing through the transition

Q. 31 Do you support the overall draft advice in this chapter?

HortNZ supports the focus on a just transition. The horticulture industry is already a major employer in some communities, and Government has a responsibility to support those existing local economies for the wellbeing of their constituents - both the workers and owners of operations who have invested in their skills and infrastructure to keep providing healthy food. Government can also partner with industry play a role in developing the horticulture workforce as part of a just transition to a low-emissions economy and build economic development hubs centred on wellbeing outcomes like healthy food access.

Q. 34 Are there any other issues or aspects of wellbeing that you think should be addressed in our advice?

Are there any gaps in our advice related to opportunities and barriers for maintaining or enhancing wellbeing through the transition to a thriving low-emissions resilient economy?

34.1 Wellbeing Through Food

Food security is a nationally significant issue which needs to be addressed at a strategic level at all scales of governance given its centrality to human health. Access to food affects all four wellbeings (social, economic, environmental, and cultural), but barriers to access, especially cost, proliferate. This makes food security a prime example of a wicked problem that could be tackled with an integrated planning approach.

Chapter 7: Agriculture

Q. 36 Do you support the overall draft advice in this chapter? Why or why not?

Horticulture is New Zealand's lowest emissions food source. We seek a stronger discussion of the policies needed to enable horticulture for a high-nutrition, low-emissions future. This chapter is focused on continuing the status quo of pastoral farming which has serious environmental consequences rather than making transformative change.

36.1 Focus on land use

²¹ Growing Together 2035: Aotearoa Horticulture Action Plan - Strategy. February 2023.

Both the first Emissions Reduction Plan and the CCC's advice for the second discuss a transition to lower emissions systems and land uses, but the focus remains on making systems changes to pastoral farming, rather than supporting and enabling land use change to horticulture. We see this as a missed opportunity. While regenerative farming may offer opportunities on the margin to reduce emissions from pastoral farming, much more significant emissions reductions could be achieved through land use change. Unlike many of the initiatives within the Emissions Reduction Plan, the emissions reductions are certain.

While technological solutions like a methane vaccine are still uncertain, reducing reliance on meat and dairy products can be an effective strategy to address the inherent emissions from pastoral farming. Lowering meat and dairy consumption or transitioning to alternative protein sources can help reduce the demand for livestock production and, consequently, methane emissions. There are further gains to be made in reducing emissions within horticulture with research into regenerative farming, soil health best practices, and alternatives or improvements to synthetic fertiliser.

36.2 Other points from the Draft Advice

The Draft Advice lauds the importance “trusted, well-resourced advisory and extension systems” to support a Just Transition (p. 88). In the case of horticulture, those trusted systems already exist within industry in the form of New Zealand Good Agricultural Practice (NZGAP), Global GAP, Zespri GAP, and the extension offered by Horticulture New Zealand and product groups. Government should support these trusted groups to provide extension rather than developing parallel systems.

We agree that agriculture, including horticulture, plays “a significant part in the Māori economy” (p. 88). Thus, breaking down the barriers for horticulture will benefit the numerous Māori/iwi growers, although particular attention should be given to building true working relationships with Māori in decision-making processes.

HortNZ agrees that land use diversification to horticulture should be mindful of climate projections to see which crops will be viable based on climate, pests, diseases (p. 92). The new Data Supermarket project from Our Land and Water brings together information about crops, climate, and economics that will be helpful for this purpose.²² Growing the right crop in the right place also requires regional and district policy settings that are permissive of orcharding or vegetable growing on suitable land.²³

We agree that demonstration farms are helpful to teach and learn emissions-lowering best practices (p. 93). Horticulture should be included in this vision. The vegetable sector is currently building a business case for a Vegetable Industry Centre of Excellence (VICE) in Pukekohe to serve as a research, teaching, and extension hub that could be a vehicle for strengthening horticultural practice and building the workforce. The Biological Husbandry Unit Organics Trust (BHU) provides existing training and extension services for organic

²² Our Land and Water. “Data Supermarket”. Accessed online 31/05/23.

<https://ourlandandwater.nz/outputs/data-supermarket/>

²³ Growing Together 2035: Aotearoa Horticulture Action Plan – Strategy. February 2023.

agriculture but is struggling to maintain funding.²⁴ The CCC should call on the Government to financially support these initiatives as part of their emissions reduction programme of work.

Outcomes sought:

- To protect horticulture from pest incursions, the Government should better resource biosecurity at all border entry points.
- Government co-funding for industry-led training and advisory services to help those seeking to transition to horticulture and to embed climate-friendly practices within the industry.

Q. 39 Are there any other aspects of the agriculture sector that you think should be covered in our final advice?

HortNZ supports the CCC's assessment that, "...land-use changes from agriculture to horticulture may increase profit while reducing biological emissions. However, barriers such as lack of infrastructure, markets, access to water, skills, or labour, as well as unsuitable growing conditions limit the potential for this." (p. 92). We argue that the policy levers described below could ease these barriers and a few others we identify. Beyond profit, policy encouraging land use change will be motivated by the need to produce healthy, affordable food for the wellbeing of New Zealanders.

39.1 Lack of Infrastructure

Well-maintained roads are essential to transfer produce to packhouses and to market. We discuss this further in response to Chapter 11: Transport. Electricity reliability is also a priority for decarbonising covered cropping, as is discussed under Chapter 9: Energy and Industry.

39.2 Markets

Under the supermarket duopoly, growers are price-takers put at a disadvantage in the domestic market. HortNZ believes the Grocery Code of Conduct needs to be mandatory and should apply to all those involved in the supply of retail products to consumers. This will ensure a fair-trading environment for growers and suppliers to all retailers.

New Zealand also needs to take more leadership promoting low emissions food in international markets. Due to recent negotiations for the Free Trade Agreement with Europe, kiwifruit, onions and apples now enter the European Union tariff free, an excellent outcome for low emissions food. The Ministry of Foreign Affairs and Trade (MFAT) should capitalise on this success and deliberately consider our global emissions in their trade advocacy. They should promote true low emissions food (rather than just carbon efficient products) with other trading partners and in international climate negotiations.²⁵

²⁴ <https://www.bhu.org.nz/>. Accessed online 08/06/23.

²⁵ Daalder, Marc. "NZ scrubbed 'plant-based' diets from climate report". 09/04/22. Updated 30/12/22. Accessed online 16/06/23. [NZ Scrubbed 'Plant-Based' Diets From Climate Report | Newsroom](#)

For improving food affordability and reducing food loss, a secondary market for “wonky” food – products that don’t meet supermarket requirements but are still safe and appropriate to eat – would provide lower cost options for price sensitive customers. Packhouses and growers would be open to this option if it is even slightly more profitable than cost neutral. Many now lose money on trucking when they send their discarded produce to animal feed. One barrier is that growers have to consider whether selling “wonky” produce will displace their other sales, driving down their already slim profits, and whether consumer demand exists for these products.

Outcomes sought:

- A mandatory Grocery Code of Conduct to ensure fair trade practices in the domestic market.
- Direct MFAT to promote true low emissions food in international trade agreements.

39.3 Access to Water

Water storage is critical to further horticultural development. A 2022 MPI technical report concludes that a further 400,000 ha of high-value land uses could be developed in Northland, Bay of Plenty, Hawke’s Bay and Otago if water storage increased irrigation capacity.²⁶

To enable water storage, national planning direction should require Regional Policy Statements to specifically provide for activities like water harvesting and localised on farm water storage to enhance local food security and food production.

The Natural and Built Environment Bill (NBA) establishes three criteria to guide future allocation of freshwater – sustainability, efficiency and equity.²⁷ In our view, water allocation decisions should defer to these principles, rather than first-in first-served. Greenhouse gas emissions should be considered under all three criteria. Lower emissions indicate sustainability and carbon efficiency, and earlier carbon mitigation does not pass the burden of warming down to future generations (which would be an inequitable outcome).

Outcomes sought:

- Develop policy settings that support expansion of and investment in water storage.
- Ensure water consent timeframes give growers the certainty to invest and increase production while improving environmental outcomes.

²⁶ Water Availability and Security: National-Scale Assessment. Aqualinc Research report RD1010-4, prepared for Ministry for Primary Industries, October 2022. Accessed online 09/06/23. [Water Availability and Security Sensitivity Analysis \(mpi.govt.nz\)](#)

²⁷ Accessed online 16/06/23. [Natural and Built Environment Bill 186-1 \(2022\), Government Bill 36 Resource allocation principles – New Zealand Legislation](#)

- Water allocation decisions should account for the emissions implications of the activity.

39.4 Skills and Labour

Horticulture employs 40,000 New Zealanders, but we face a chronic labour shortage which is leading to both economic losses and food waste. To reach our potential, we must attract and retain many more motivated and skilled people to work in horticulture, from both New Zealand as well as overseas, especially during seasonal harvest peaks. This requires tailored labour and immigration policy settings.

The Draft Advice calls for upskilling for farm advisors (p. 93), but training is also urgently needed to train horticultural workers given the industry's labour shortage.

Outcomes sought:

- Labour policy decisions are made through the lens of a just transition and enabling low emissions land use.
- Ensure sustainability of the Recognised Seasonal Employer (RSE) scheme for both the Pacific and the horticultural industry, given how invaluable that skilled workforce is for growers.
- Competitive Working Holiday visa schemes with a low entry fee to encourage backpackers.
- Vocational training schemes must reflect horticulture's complexity and grow a much larger base of people with the skills to drive the industry forward.
- Co-funding for innovative skills training projects like the Pukekohe-based Vegetable Industry Centre of Excellence (VICE).

39.5 Compliance

Compliance and mitigation costs need to align with scale and impact when we discuss agricultural emissions. It is otherwise inefficient and could limit opportunities for positive change. For instance, undue regulatory pressure is already preventing the expansion of vegetable growing from keeping up with population growth in New Zealand, despite horticulture being a low emissions industry.

The investment that goes into horticulture takes decades – deciding to buy trees and plant variety licenses, investing in water infrastructure, or developing low-emissions glasshouse heating systems all require confidence that these investments will pay off in the long run, well beyond the temporal scale of changing political administrations.

It is critical that national planning direction is integrated, so that policy statements are consistent and work toward common goals. When national policies are aligned, they will reinforce and amplify each other's impacts. By considering the interconnections and interdependencies among various sectors, policies can be designed to generate positive

spill over effects and avoid unintended negative consequences. This holistic approach helps maximize the overall effectiveness of policies.

Integrated policies enable better resource allocation, preventing redundant efforts or inefficient use of Government time and money resolving contradictory decisions. Consistent national direction also fosters more confidence in the long-term stability of the policy regime.

Outcomes sought:

- Food must be provided for in the National Planning Framework, and national policy statements should work in concert minimise duplication or contradiction.

Chapter 8: Built Environment

Q. 41 Do you support the overall draft advice in this chapter? Why or why not?

HortNZ support densification of cities (p. 98). We recommend adding criteria to avoid inappropriate use and development of highly productive land as required by the National Policy Statement for Highly Productive Land (NPS-HPL). Horticulture often takes place on the urban-rural fringe and is thus most at risk from urban sprawl.

In line with reducing sprawl, additional housing should not come at the expense of rural production or seasonal workers accommodation, which provides a safe and healthy living environmental for essential horticultural workers.

Q. 45 Are there any other aspects of the built environment sector that you think should be covered in our final advice?

At present, natural resource allocation decisions to support our food system are about the availability of land and water, but planning frameworks also need to provide the flexibility of land use for growers to uptake new growing systems like glasshouses or intensive indoor production as technology becomes more economically viable. These activities can span the urban-rural divide and provide hyper-local food production. Spatial planning should consider where these indoor horticultural activities can take place in proximity to auxiliary infrastructure like packhouses and transportation corridors for distribution.

Spatial planning should also allow construction of packhouses, glasshouses, seasonal worker accommodation, and covered crop protection on horticultural land in recognition that buildings and infrastructure are integral parts of horticulture.

Chapter 9: Energy and industry

Q. 47 Do you support the overall draft advice in this chapter? Why or why not?

HortNZ supports the goal of electrifying process industries (p. 111). We also agree that it would be beneficial for the production and consumption of biogas to occur in the same location, and food processing is a possible candidate (p. 117).

Q. 50 Are there any other aspects of the energy and industry sector that you think should be covered in our final advice?

50.1 Covered Cropping

Covered cropping is the practice of growing indoors, which is essential to provide the tomatoes, cucumbers, capsicum, and leafy greens that Kiwis eat year-round. Consumers expect access to these crops, which drives production.

50.2 Covered Cropping as Climate Adaptation

An increase in covered cropping will be essential to adapt the food production system to the variable weather that comes with a changing climate while still producing enough food for our population. Indoor growing systems are less vulnerable to environmental conditions and pressures such as significant weather events. During Cyclone Gabrielle, 80% of the tomatoes grown outdoors for processing were destroyed, whereas the supply of indoor grown greenhouse tomatoes was relatively unaffected.²⁸

Covered crops play an important part in providing supply of fresh produce at times of the year when outdoor cropping is challenging. Covered crop growers even out the supply of fresh produce, extending the availability of seasonal crops. Indoor growing systems also use less water and land and fewer nutrients than growing outdoors.

50.3 Fuel Sources for Covered Cropping

Because of the necessity of affordable food, a just transition requires food system decarbonisation to avoid disrupting production and supply chains. Settings from the Emissions Trading Scheme are making it more difficult for growers to produce vegetables at an affordable price, which is necessary to both keep them in business and ease the cost-of-living crisis. Natural gas, the favourite fuel source for covered cropping, is getting prohibitively expensive for larger growers.

From a grower's perspective, natural gas is the best available fuel source to heat covered cropping systems, although it is only available on the North Island. Growers can capture CO₂ outputs and pump that gas into their glasshouse to boost yields, improving plant productivity by half. This allows growers to produce more vegetables faster, thus feeding more people. The plants then release much of that CO₂ as O₂, offsetting some of the emissions from burning natural gas.

Alternative CO₂ sources are in development but not yet commercialised. Hot Lime Labs in Wellington is in the final stages of commercial development for technology to produce CO₂ from biomass.²⁹ New Zealand could be a global leader in this space since CO₂ for

²⁸ TomatoesNZ

²⁹ Hot Lime Labs. "Green CO₂ for Horticulture". Accessed online 31/05/23. <https://hotlimelabs.com/>

indoor growing is a problem in every country with glasshouses. Given the fragility of the CO₂ supply chain which struggled with shortages in early 2023, growers will only switch fuel sources if natural gas becomes too expensive, but their yields will decrease.

In terms of alternative fuel sources, the highest priority for decarbonisation is coal, which heats 26% of covered cropping systems by area and contributes 50% of the sector's greenhouse gas emissions.³⁰ Coal, which is used almost exclusively in the South Island due to lack of access to natural gas, is a high emissions fuel source that also worsens air quality and carries the risk of exposing users to heavy metals which are harmful to human health.

Waste oil is another popular alternative fuel source which growers will be far less likely to give up because it isn't priced under the ETS. It has the added benefit of burning clean, resulting in less air pollution.

Currently, only 11% of covered cropping systems by area use renewable energy sources.³¹ Biomass from forestry residues is one viable renewable energy source. Small growers can even localise this option by accepting biomass from local arborists. Electricity is also an attractive option because it is mostly renewable. The wrinkle is that the South Island especially faces frequent power cuts, which leaves people to turn on their high emissions diesel generators while they await restored power. More reliable electricity infrastructure is required to avoid this negative consequence.

While switching to renewable systems is better for the environment, the transition costs and slow return on investment make the change untenable for horticultural businesses, which have the slimmest of margins.

50.4 What would it take for covered cropping to decarbonise?

Funding is the most important way the Government can push the covered cropping sector to decarbonise. Small-to-medium growers, who make up half of the industry at current estimates, do not have the capital on hand to make these changes. These growers need grants to either switch fuels or improve energy efficiency because these changes are cost prohibitive and have slow returns on investment. Easily accessible low interest loans would also help.

Especially for growers in the South Island, switching to electricity would require huge investments in electricity infrastructure upgrades. Electricity companies are asking for cost-prohibitive capital contributions from customers to join the grid, and rural electricity users already face several power cuts per year without the additional load. The Government should take on responsibility for ushering in a green transition through subsidising these costs because growers cannot pay for these upgrades. The Government needs a plan to improve regional infrastructure such that businesses can tap in without extensive costs. The most cost-effective path is community infrastructure, which is more efficient than building transformers for each individual business.

³⁰ Deta Consulting. *Covered Crops Decarbonisation Plan: Final Report Revised*. 08/02/2022. (p. 10-11)

³¹ Deta Consulting. *Covered Crops Decarbonisation Plan: Final Report Revised*. 08/02/2022. (p. 10)

Ground source heat pumps are one renewable energy system with sector interest and a high return on investment, but growers need these technologies de-risked for their use to be viable. The initial drilling is capital-intensive and not guaranteed to find a usable heat source. Geological and Nuclear Sciences (GNS) has a plan to map low-temperature heat sources in New Zealand, but they cannot pay for it independently. Given that low-temperature heat pumps have applications for commercial and residential buildings as well as industry, no single industry body will take on the cost. The Government is best positioned to take on a larger proportion of funding given the broad applications and benefits of the mapping.

Outcomes sought:

- Grants and low interest loans for covered cropping decarbonisation for small to medium growers to overcome debilitating transition costs.
- Electricity infrastructure upgrades for renewable covered cropping businesses.
- Fund mapping for ground source heat.

Chapter 10: Forests

Q. 52 Do you support the overall draft advice in this chapter?

HortNZ agrees that offset has an important part to play in managing the impacts of emissions. The horticulture sector is not opposed to the use of forestry for offset, but we consider that alongside the carbon price there is the need for strong regulation to ensure that environmental effects are managed and that the price of the carbon offset does not distort land use patterns such that low emissions food production is replaced by carbon farming.

Q. 54 Are there any other aspects of the forests sector that you think should be covered in our final advice?

New Zealand's experiments in carbon farming through forestry can serve as a case study for the negative externalities of this type of climate change mitigation. Plantation forestry has done little for native biodiversity due to perverse policy incentives that encourage pine monocultures. Poor management practices also contributed to the silt and slash that devastated Tairāwhiti and Hawke's Bay during Cyclone Gabrielle.

Most plantation forestry is located on the less productive farmland primarily used for meat production. The National Policy Statement for Highly Productive Land (NPS-HPL) does not, however, restrict plantation forestry even on the most highly productive land suitable for horticultural production. The NPS-HPL and the ETS settings should have regard for food security by preventing this mismatch of land use.

It is also important that the externalities of carbon forestry in upper catchments, associated with slash movement and deposition in floods, are not borne by horticultural production on highly productive land on flood plains. The torrent of forestry slash swept onto orchards and vegetable growing land, as well as other businesses and homes during Cyclone Gabrielle, was attributable to forestry practices that leave organic material on the ground in a push for efficiency. Pine forests were initially planted in New Zealand in response to the erosion caused by land clearance for pastoral farming. The problem is that when those pine forests reach maturity, they are cleared all over again when the lumber is harvested, once again making the land vulnerable to erosion. Forestry companies should be responsible for evaluating the downstream effects of their work, including erosion modelling and disaster plans for major flooding events. They should also be held accountable for the negative externalities of offsetting.

We should encourage the planting of native forests rather than the cheapest monoculture by presenting the effects for ecosystem health, longer term sequestration, and bolstering identity through pride in a country's nature. Planting forests should be balanced with protecting highly productive land for food production, and responsible forestry practices are required to prevent damage from slash and erosion.

Creative solutions to incorporate forestry with food production are a possible future-focused solution. Food forests, also known as agroforestry, are production systems that mimic natural forests by incorporating a diverse mix of trees and smaller plants.³² These systems provide food, fuel, and fibre with the added benefits of carbon sequestration, biodiversity conservation, soil health and water management.³³ Environmental action should not come at the expense of human health and wellbeing, especially since those two goals can work in tandem with careful planning.

Chapter 11: Transport

Q. 56 Do you support the overall draft advice in this chapter? Why or why not?

No specific comments.

Q. 60 Are there any other aspects of the transport sector that you think should be covered in our final advice?

60.1 Roads

Flood-resilient transportation infrastructure is a climate adaptation action to make sure that our food system still works in times of crisis.

³² Nair, PK Ramachandran. An introduction to agroforestry. Springer Science & Business Media, 1993.

³³ Ramachandran Nair, P.K., Mohan Kumar, B. and Nair, V.D. (2009), Agroforestry as a strategy for carbon sequestration. *Z. Pflanzenernähr. Bodenk.*, 172: 10-23. <https://doi.org/10.1002/jpln.200800030>

Extreme weather events are putting pressure on already stressed networks. When Tairāwhiti Gisborne faces extreme rain events, flooding and road closures prevent safe transportation of people and food products. It is extremely difficult to transport fresh produce from the region to market when there is not the roading infrastructure to support delivery. Impact on the food system should be a criterion for prioritising road maintenance and upgrades.

An efficient roading network also means fewer emissions and manageable costs for freight operators. Increased freight times due to congested networks also increases cost and emissions from stalling vehicles. These costs are then passed on to consumers with higher food prices.

70.2 Vehicles

On-farm vehicles, including light commercial vehicles (e.g., utes) and machinery for cultivation and harvest are important to growers. While electric alternatives are available in some areas (e.g. forklifts) this is not the case for other types. Beyond the orchard gate, trucks are frequently used to transport fruit and vegetables to New Zealand consumers or ports, and some growers have their own truck fleets. We could be an early adopter of electric trucking if it was affordable, the charging infrastructure was there, and the electric grid was prepared to accept the additional load. Alternative fuels are another option; H.W. Richardson is already trialling hydrogen-diesel trucks which have the potential to reduce trucking carbon emissions by 40%.³⁴

The sector is particularly reliant on trucks as a mode of transport between the orchard/farm, packhouse, and/or processing facility and port. The distributed nature of horticulture and the perishability of fresh product creates limitations on the use of rail and coastal shipping, particularly for domestic distribution. Airfreight transportation is used for fruits with a short shelf life. However, there could also be strategic planning opportunities which support mode shift where the location is appropriate. For instance, a rail hub near Pukekohe connected to Auckland and Tauranga Ports would significantly reduce road freight movements through Auckland.

HortNZ supports a long-term vision of zero emissions commercial vehicles including vans, utes, and trucks. While we support the aim of the Clean Car Standard which charges importers for vehicles that emit more CO₂, it is concerning that utes and trucks necessary for rural production are captured under this scheme even though affordable alternatives are unavailable. These charges are then used to subsidise rebates for people who buy lower emissions cars. There is concern that this type of system penalises rural primary producers to fund new cars for wealthier people in urban areas.

70.3 Shipping

Low and zero-emissions maritime fuels can fast-track the decarbonisation of international shipping and reduce New Zealand's vulnerability to fluctuating global fossil fuel prices.

³⁴ H.W. Richardson. "Driving Change. Driving Hydrogen." Accessed online 12/06/23.
<https://www.hwr.co.nz/hydrogen>

Without shipping alternatives, global emissions pricing will increase fuel costs, driving up the prices of imported food and reduce market access for our exported goods.

New Zealand should prioritise and invest in lower emissions maritime shipping to bolster our country's reputation as a sustainable producer.

Low or zero-emissions ships will be bigger, so New Zealand ports need upgrades to reduce congestion and keep up with changing shipping expectations. Existing processes for developing ports are lethargic and costly - making the upgrades we need should have priority given their potential to enable low emissions maritime trade.

Outcomes sought:

- Maintain and upgrade rural road networks to enable horticulture.
- Fund EV charging infrastructure in rural areas.
- Maintain and upgrade rural electrical infrastructure to support additional load.
- Establish green shipping corridors and invest in low or zero-emissions fuels for maritime transportation.
- Fast-track port upgrades to allow for larger, low or zero-emissions shipping vessels.

Chapter 12: Waste and fluorinated gases (F-gases)

Q. 62

Do you support the overall draft advice in this chapter? Why or why not?

62.1 Food Waste is a Distraction

The 9% of methane emissions from waste are a convenient distraction from the 91% of methane emissions attributable to pastoral farming (p. 88). While the CCC writes that waste has "relatively higher potential to reduce emissions" compared to other biogenic methane sources, waste emissions represent 1/10th of the overall issue (p. 44). Agricultural emissions, especially from livestock and manure management, are a significant and challenging source to tackle. Underemphasizing agricultural emissions in favour of waste may hinder comprehensive efforts to address all major sources of methane emissions.

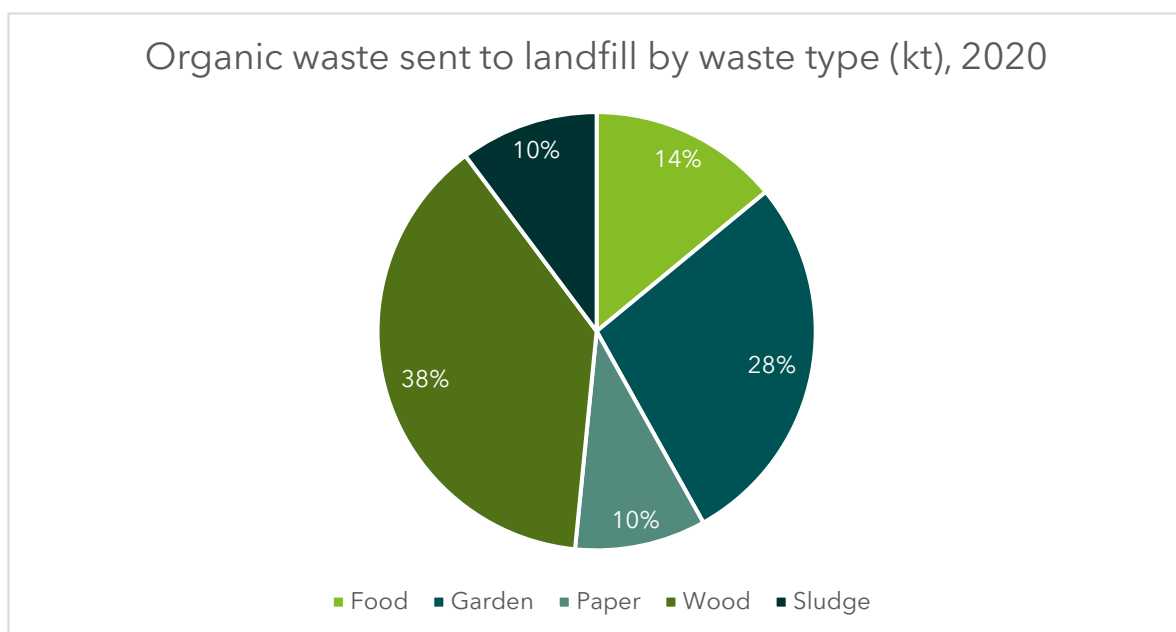
The CCC's key recommendation for waste is to bolster landfill gas capture systems and data collection (p. 14). Waste Management, one of New Zealand's largest waste management providers, already captures over 90% of landfill gas, according to their website.³⁵ This raises the question of whether the CCC's estimates of methane from landfills consider the amount that is already being captured. If not, the emissions estimate may be artificially inflated. The supporting document to this consultation, "Updated

³⁵ Waste Management. Accessed online 29/05/23. [Landfills and the Emissions Trading Scheme \(wastemanagement.co.nz\)](https://wastemanagement.co.nz)

demonstration path and current policy reference scenarios,” does not show a calculation for emissions already captured by landfill gas capture systems.³⁶

In the CCC’s demonstration path data, 319.0 kt food waste was generated in 2020.³⁷ 319.0 kt food waste was sent to landfill, and 179.6 kt food waste was diverted for compost, which adds up to 498.6 kt food waste overall. These numbers don’t add up, which casts doubt on the integrity of the calculations. Ensuring accurate data and assessments are used to inform policy decisions is crucial in effectively addressing methane emissions.

In addition, the chart below, based on the CCC’s own data, shows that food waste only made up 14% of organic waste sent to landfill in 2020. HortNZ is concerned that the policy focus on food waste is a distraction from larger sources of waste and non-waste emissions, which are orders of magnitude higher.



Source: Climate Change Commission. Updated demonstration path and current policy reference scenarios (2022). 26/04/23. Accessed online 31/05/23.

HortNZ is also concerned whether the CCC has considered the emissions that will be required to truck organic waste diverted from landfill and what will be done with the outputs of anaerobic digestion or other industrial composting processes. Councils have not been given direction for what to do with the compost they produce when kerbside organic pick-up is mandated under current waste legislation reform.³⁸

³⁶ Accessed 31/05/23. <https://www.climatecommission.govt.nz/public/Advice-to-govt-docs/ERP2/draft-erp2/supporting-documents/ERP2-supporting-spreadsheet-Updated-demonstration-path-and-CPR-2022.xlsx>

³⁷ Accessed 31/05/23. <https://www.climatecommission.govt.nz/public/Advice-to-govt-docs/ERP2/draft-erp2/supporting-documents/ERP2-supporting-spreadsheet-Updated-demonstration-path-and-CPR-2022.xlsx>

³⁸ Ministry for the Environment. “Waste legislation reform.” 29/03/23. Accessed online 31/05/23. <https://environment.govt.nz/what-government-is-doing/areas-of-work/waste/waste-legislation-reform/>

62.2 F-gases

Structurally, it is unclear why waste and F-gases are combined in advice and charts when they are different sources, emitting different gases, with different solutions.

Q. 65 Are there any other aspects of the waste sector and F-gases that you think should be covered in our final advice?

65.1 Methane

For an effective methane reduction effort, the Government needs an implementation plan with clear budgetary priorities against activities. This plan should consider the relative emissions reduction potential of each activity, leverage the existing work priorities of government departments, and consider the cost of abatements.

Outcomes sought:

- Government methane reduction itemised budget and implementation plan.

65.2 F-gases

The CCC should recommend expanding funding sources available for industry decarbonisation to include coolstore refrigerant gas replacements. The horticulture industry uses cool storage to extend the shelf-life of produce and reduce food waste. Investing in alternative refrigerant gas replacements is capital-intensive. Expanding the scope of the Government Investment in Decarbonising Industry (GIDI) fund would accelerate the transition.

Chapter 13: Research, science, innovation and technology

Q. 67 Do you support the overall draft advice in this chapter? Why or why not?

HortNZ agrees that a stronger research system is much needed to achieve our climate goals. We also agree about the need for open data.

67.1 Staged Implementation

Given that early adoption of new technologies is risky (p. 160), climate change mitigation and adaptation policies that require behaviour change to new practices or technologies should be designed to support innovators and early adopters before trying to get the majority and stragglers on board. Under Diffusion of Innovation (DOI) Theory, which describes the staged uptake of new ideas, behaviours or products, individuals or firms do not all adopt innovations simultaneously.³⁹ Instead, innovators and early adopters lead the

³⁹ El Malouf, N. & Bahemia, H. (2023) Diffusion of Innovations: A review. In S. Papagiannidis (Ed), TheoryHub Book. Available at <http://open.ncl.ac.uk> / ISBN: 9781739604400

way so that their more risk-averse peers have examples to follow once the new idea is proven in practice.

In the context of horticultural climate action, this means providing incentives for the growers who have both the risk-taking nature and the available resources to lead the way on electrification, agroecological crop protection⁴⁰, and other beneficial practices. The Sustainable Food and Fibre Futures (SFFF) funding from the Ministry for Primary Industries (MPI) provides grants for the innovators, but financial support is also needed for the next 10% of growers who uptake the innovation, especially for capital-intensive projects that will only become affordable with scale. Only after these groups are given the chance to prove the idea works in practice should the Government expect most growers to uptake the innovation, supported by education and evidence that the innovation works. Then, the Government can introduce disincentives to scoop up the last stragglers who are most sceptical of change.

Q. 68 Are there any other aspects of the Research, Science, Innovation and Technology sector that you think should be covered in our final advice?

New Zealand should encourage international companies to see New Zealand as a launch pad for low emissions agricultural technology. New Zealand provides a small ecosystem for testing products within a country that has the policy settings to incentivise climate action. Our growers are more than open to innovation and experimentation if it is financially viable.

68.1 Technology

To enable horticulture growth to continue and increase, we need R&D investment in robotics, advanced breeding and digital technologies.

Automation has the potential to unlock industry growth and ease our labour shortage. It is highly capital-intensive, but depreciation relief from the Government through tax incentives to free up capital for investment.

We seek targeted investment in accelerating research and technology uptake for process heat and alternative fuels. New Zealand does not have the capacity to develop all of the technology that we need on our own. We seek favourable conditions for international companies to test new agricultural technology in New Zealand, so that we are well positioned to be early adopters.

Outcomes sought:

- Investment in horticultural automation through depreciation relief.

68.2 Science

HortNZ's proposed funding approach for government research prioritises strengthening low-emissions land uses that are already contributing to a sustainable future, rather than

⁴⁰ A Lighter Touch. Accessed online 12/06/23. <https://a-lighter-touch.co.nz/programme-overview/>

directing all resources towards subsidizing marginal emissions reductions in high-emissions practices. By focusing on supporting and enhancing existing low-emissions industries, we can maximize the impact of government funding and foster the transition towards a more sustainable economy.

Equitable investment in horticulture R&D will help our sector further improve our environmental outcomes on pace to other sectors. Further science that would be most valuable to horticulture for a low emissions future include cropping systems and varieties that are more climate resilient and crop protection to manage pests and diseases. Researchers can also investigate fertilisers that have fewer emissions and are better matched to the uptake of plants, and the relationship with soil processes.

HortNZ would like to see research into climate adaptation strategies for horticulture. Some growers bounced back more quickly than others after multiple flooding events this year which doused, but did not destroy, orchards and paddocks on the upper North Island. Case study analysis into successful flooding mitigation and recovery strategies would be valuable to prepare for future events.

HortNZ also calls for a New Zealand evidence-based approach to chemical reassessment. The Environmental Protection Agency (EPA) has a product priority reassessment list. They also reassess chemicals not included on this list like hydrogen cyanamide (commonly referred to as Hi-Cane), which is critical for kiwifruit production. Bans on essential chemicals may put growers out of business, which would result in higher emissions land use change. Clarifying the reassessment process and conducting appropriate cost-benefit analysis is necessary to ensure horticulture has a clear pathway to operate.

Research into pest management programmes that are effective, sustainable and gentle on the environment is already underway through A Lighter Touch, a \$27 million, seven-year industry-led programme supported by MPI.⁴¹

Outcomes sought:

- Direct more research funding toward existing low emissions industry.
- Investment in innovation to develop new cropping systems and varieties that are more resilient to climate change.
- Research into adaptation and recovery after flooding and extreme weather events and transitioning to horticulture as a low emissions land use activity .
- Speed up regulatory approval of new sustainable crop protection products, particularly when these produces are already approved for use in export markets.
- HortNZ seeks that the EPA work with the horticulture sector to clarify the balance between environmental and economic benefit. We also seek that the EPA co-design studies with industry to determine the costs and benefits as well as the loss of food production when existing productive chemicals are removed from use.

⁴¹ A Lighter Touch. Accessed online 12/06/23. <https://a-lighter-touch.co.nz/programme-overview/>

Chapter 14: Funding and finance

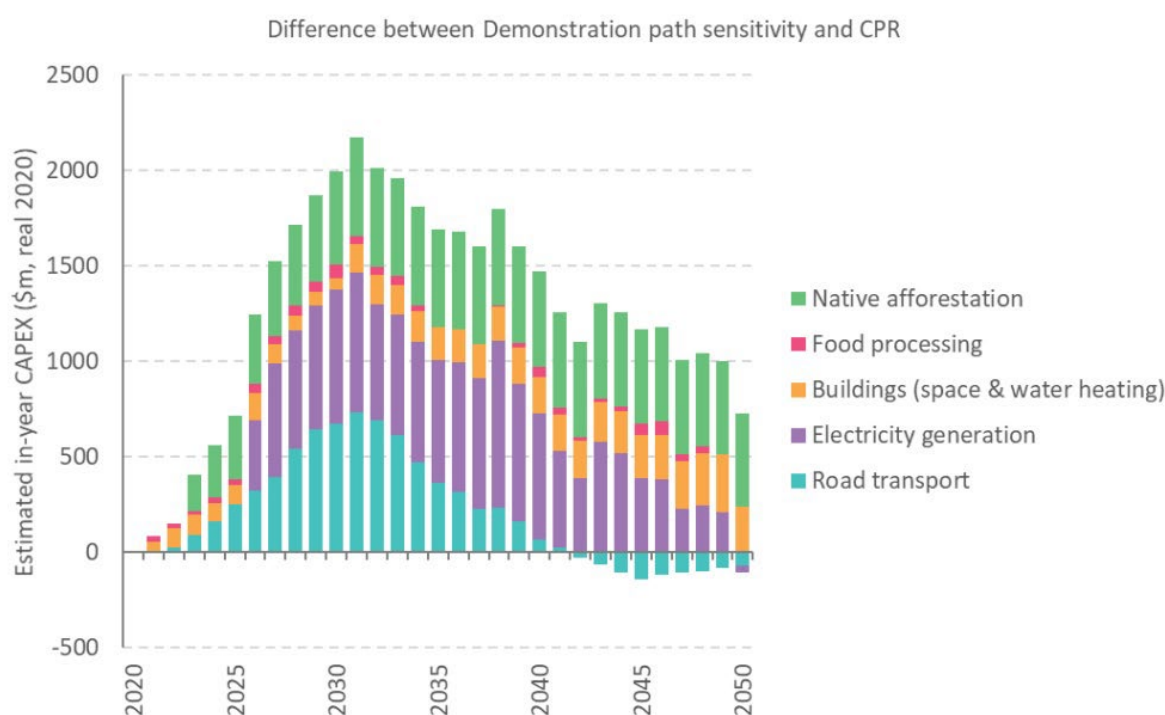
Q. 70

Do you support the overall draft advice in this chapter? Why or why not?

HortNZ supports the objective of “aligning all public investments with Aotearoa New Zealand’s climate goals” (p. 161). This should mean supporting innovations in low-emissions industry and rewarding existing low emissions industry rather than subsidising high emissions practices.

Figure 14.1 from the Draft Advice shows that further funding is needed for food processing.

Figure 14.1: Differences in annual capital investment between the modified demonstration path and Current Policy Reference case



HortNZ supports the need to invest in mitigation and adaptation simultaneously (p. 162). Switching to plant-based food production and developing a local food supply is an example of this. Lower emissions food production is a mitigation strategy, while preparing for climate change-related storms to disrupt international food supply is an adaptation strategy.

Q. 71

Are there any other aspects of the funding and finance sector that you think should be covered in our final advice?

HortNZ agrees that the Government needs a “holistic and centralised Government investment strategy” with a focus on climate impacts, including agriculture.

Agriculture is responsible for one third of global greenhouse gas emissions, but only 3% of climate finance is dedicated to the sector. This is a massive, wasted opportunity to reduce emissions through transforming food systems with climate financing. In addition, there’s room to align work in this space to achieve Sustainable Development Goals 2 and 3 to reduce world hunger and improve human health.

We need to reform financial incentive systems to reward climate action in food production, including producing healthy food, diversifying to plant-based protein sources, regenerative agriculture, and strengthening local food systems. Financing could be conditional on environmental criteria, such as sustainability-linked loans and insurance products. Those criteria should look at the food system as whole rather than comparing apples to apples within one industry - otherwise, sectors that are already producing fewer emissions may bear undue burden.

New Zealand needs to make sure its funding and support directed to agriculture does not counteract its climate action, and climate-directed finance for food systems is proportionate to expected impact.

Chapter 15: Circular economy and bioeconomy

Q. 73 Do you support the overall draft advice in this chapter? Why or why not?

The Draft Advice writes, “For the horticulture and agriculture sectors, utilising organic waste by-products for composting or fertiliser can increase soil health while reducing costs and embodied emissions associated with procuring synthetic fertiliser” (p. 175). For most annual crops, compost is used to improve soil health rather than provide nutrients. If growers are going to use organic waste by-products as an alternative to synthetic fertiliser, those products will need to:

- come in a form usable with common machinery and existing techniques;
- be cost competitive per crop yield (taking into account \$/tonne, labour, machinery, and risk cost including the weather windows in which it can be applied);
- have environmental benefits; and
- avoid new food safety, labour or environmental risks.

To understand whether commercial compost can compete with synthetic fertiliser, it is important to understand the following points.

73.1 Precise Nutrient Requirements

- Crops require nitrogen, phosphorus, potassium, and other secondary nutrients in specific quantities that vary based on soil conditions and plant type. Organic waste outputs would need to be able to meet these specific nutrient demands consistently to achieve expected yields within growers' nutrient budgets.
- One of the main limitations of relying on composts and plant residue is predicting the release rate of nutrients and the relationship to the uptake demand. Horticultural crops each have different demands, which makes them more complex to serve than pasture.

73.2 Efficiency

- One of the barriers to compost use is the volume of required to meet crop demand, which is far higher than the volume of conventional fertilisers. That volume comes with associated transport, labour, and machinery costs for application to the soil. Additional volume also introduces time and weather risks to get compost on the soil at the right time.
- Growers spend a lot of money and effort using the least fertiliser possible because that is the most financially and environmentally-sound business decision. They invest in fertigation and machinery for precision placement. Compost, by volume and nutrient content, is far less efficient which comes with higher risk of losses to the environment through air and water.

73.3 Contamination

- Compost carries the risk of trace elements like cadmium which can accumulate in leafy vegetables.
- Compost also carries the risk of E. coli. This is a key concern for the horticulture sector because fruits and vegetables are eaten raw and unprocessed, and they are subject to strict food safety testing and standards.
- Horticulture NZ strongly opposes the use of treated human waste for irrigation. The sector will not irrigate our crops with treated wastewater or use composts that include human biosolids. Our resistance is related to market requirements, consumer preferences and tikanga Māori.

73.4 Emissions

In terms of the circular economy, we wonder whether commercial compost produced from food waste might result in emissions swapping from short-lived gasses (methane) to long-lived (CO₂) from transport, processing, and tractor passes. A carbon lifecycle assessment is needed consider the proportion of synthetic fertiliser emissions produced offshore as well as local emissions.

Outcomes sought:

- Carbon lifecycle assessment of commercial compost versus synthetic fertiliser emissions.
- Research significant knowledge gap in balancing crop yield and nutrient losses to the environment from compost versus synthetic fertiliser use.

Q. 74

Are there any other aspects of the circular and bioeconomy sector that you think should be covered in our final advice?

No specific comments.

Submission on 2023 Draft Advice Recommendations

Without limiting the generality of the above, HortNZ seeks the following decisions on the recommendations of the Draft Advice, as set out below, or alternative amendments to address the substance of the concerns raised in this submission and any consequential amendments required to address the concerns raised in this submission.

Recommendation	Agreement	HortNZ Comments
1. Commit to a specific level of gross emissions for the second and third emissions budgets, no less ambitious than 362 MtCO ₂ e and 322 MtCO ₂ e respectively and ensure that its policy choices align with delivering this outcome.		No specific comments.
2. Communicate indicative levels of gross emissions and carbon dioxide removals from forestry out to 2050 and beyond to guide policy development.	Fully agree	HortNZ agrees that gross emissions reductions are necessary, and we need to plan for 2050 and beyond. The relative benefits of native forests and plantation forestry should be considered.
3. Make the emissions pricing system consistent with delivering the specific levels of gross emissions for the second and third budgets, and with the 2050 net zero target, by: <ol style="list-style-type: none"> implementing an amended NZ ETS that separates the incentives for 	Fully agree	HortNZ agrees that this change will fix perverse incentives from the current Emissions Trading Scheme which led to the negative externalities described in our comments under Chapter 10: Forestry.

gross emissions reductions from those applying to forestry.		
b. developing an approach that can provide durable incentives for net carbon dioxide removals by forests through to and beyond 2050.	Somewhat agree	HortNZ agrees with this concept, but the recommendation should also consider the need to retain highly productive land for food production. Forestry can currently locate on highly productive land under the NPS-HPL even though it most often occurs on less productive soils.
4. Accelerate Iwi/Māori emissions reductions in conjunction with climate change adaptation initiatives by exploring and implementing a mechanism to allocate resourcing direct to Iwi and increase funding to Māori landowners (Te Ture Whenua entities).	Somewhat agree	Regarding Māori agribusiness, one area of direct support would be through tailored assurance options that reduce compliance costs under environmental regulations. We also support improved Māori access to capital for investment into low emissions industry. We discuss these policies more under Chapter 5: Whāia Ngā Tapuwāe.
5. Ensure Iwi/Māori can drive the integration of mātauranga Māori into policy design, development, and implementation at central and local government level, by delivering sufficient resources to Iwi/Hapū.	Somewhat agree	Given the complexity of horticultural compliance, especially for Iwi/Māori with collective assets, HortNZ supports tailored integrated assurance programmes that enhance mana motuhake. We discuss NZGAP's proposal for implementing co-designed compliance solutions under Chapter 5: Whāia Ngā Tapuwāe.
6. Enable a fair, inclusive, and equitable transition for New Zealanders by expanding the scope of the Equitable Transitions Strategy to include compounding impacts of climate change and adaptation as well as mitigation.	Fully agree	A just transition is only possible if adaptation is considered alongside mitigation. Climate weather events are already here, as evidenced by Cyclone Gabrielle. Several extreme weather events in 2023 have already affected our food supply, making some fruits and vegetables difficult to find on the shelves or less affordable for consumers. The Equitable Transitions Strategy must take a food security lens to ensure that New Zealanders are able to meet their health and nutritional needs.

<p>7. Make use of existing mechanisms to manage impacts of climate policies in the interim, rather than delaying climate action.</p>	<p>Fully agree</p>	<p>HortNZ supports taking action as soon as possible with the tools available while simultaneously developing strategies for the future. When it comes to the existing welfare system, food affordability is best tackled at the systems level rather than methods that risk reducing peoples' autonomy to make nutritional decisions for their families.</p>
<p>8. Enhance advisory and extension services to farmers to enable them to respond to pricing and accelerate the adoption of emissions-efficient practices, appropriate land-use diversification, and emerging technologies to reduce gross emissions. These services should be co-designed and implemented in partnership with industry and Iwi/Māori.</p>	<p>Somewhat agree</p>	<p>HortNZ supports the need to help farmers with the regulatory onslaught they face. Industry assurance schemes and representative bodies like Good Agricultural Practice (GAP) and Horticulture NZ are already primed to deliver these functions. Any further Government efforts must be co-designed and co-implemented with industry to ensure that they work for growers. Existing industry extension entities are described under Chapter 7: Agriculture.</p>
<p>9. Advance the agricultural emissions pricing system to:</p> <p>a. enable recognition of a broader range of emissions-reducing practices and technologies</p>	<p>Somewhat agree</p>	<p>Emissions reduction technologies which support the horticulture industry should also be included in these considerations. For instance, revenue from pricing emissions should go toward we research and support for commercially viable substitutes for synthetic fertilisers. Some of the barriers to this are discussed under Chapter 12: Waste and Fluorinated Gases (F-Gases).</p>
<p>b. incentivise gross emissions reductions in line with the 2050 target.</p>	<p>Fully agree</p>	<p>Incentivising gross emissions reductions should include significantly reducing methane emissions. The Draft Advice needs to take more active consideration of land use change to horticulture. Land use change in Chapter 7: Agriculture almost exclusively refers to forestry when horticulture is an option with co-benefits for the environment, rural communities, human health and wellbeing.</p>

10. Implement an integrated planning system that builds urban areas upward and mixes uses while incrementally reducing climate risks.	Fully agree	HortNZ fully supports the need for an integrated planning system. Building up is essential to avoid both urban sprawl onto highly productive land and transportation emissions.
11. Incentivise comprehensive retrofits to deliver healthy, resilient, low emissions buildings.		No specific comments.
12. Prohibit the new installation of fossil gas in buildings where there are affordable and technically viable low emissions alternatives in order to safeguard consumers from the costs of locking in new fossil gas infrastructure.		No specific comments.
13. Prioritise and accelerate renewable electricity generation build and ensure electricity distribution networks can support growth and variability of demand and supply.	Fully agree	HortNZ supports this aim as long as highly productive land is protected.
14. Pursue more widespread process heat decarbonisation and establish mechanisms for other industrial sectors and processes to decarbonise.	Fully agree	HortNZ strongly agrees that process heat decarbonisation is essential. Our response to Chapter 9: Energy and Industry goes into detail about the support needed for covered cropping to decarbonise.
15. Set and implement integrated objectives for the role of forests with respect to emissions	Somewhat agree	Integrated objectives should ensure that forestry does not come at the expense of food production on highly productive land. These objectives also need to

mitigation and adaptation, while giving effect to the principles of Te Tiriti o Waitangi/The Treaty of Waitangi.		consider poor management processes that led to the damaging slash and silt during Cyclone Gabrielle.
16. Simplify planning and increase funding of integrated transport networks that optimise public and active transport. For major population centres, the Government should also complete cycleway networks by 2030 and take steps to complete rapid transport networks by 2035.	Somewhat agree	We support these aims but there should also be more focus on rural roading networks.
17. Rapidly resolve the barriers to scaling up vehicle charging infrastructure.	Somewhat agree	We support this aim as long as the distribution of costs does not fall to rural communities.
18. Develop incentives to accelerate the uptake of zero emissions commercial vehicles, including vans, utes, and trucks.	Somewhat agree	There should be financial support for uptake of EV commercial vehicles, in particular trucks for the distribution of perishable foods to New Zealand communities.
19. a. Apply regulatory and policy instruments to achieve the optimal use and efficiency of landfill gas capture systems and technologies at all landfills.	Somewhat agree	HortNZ supports this policy and recognises that many landfills already use landfill gas capture systems.

b. Improve the accuracy and transparency of landfill gas capture data by reviewing and strengthening relevant regulatory and policy tools.	Fully agree	HortNZ supports this policy.
--	-------------	------------------------------